FILE HISTORY

US 6,757,718

PATENT:	6,757,718
INVENTORS:	Halverson, Christine
	Julia, Luc
	Voutsas, Dimitris
	Cheyer, Adam
TITLE:	Mobile navigation of network-based electronic information using spoken input
APPLICATION NO:	US2000608872A
FILED:	30 JUN 2000
ISSUED:	29 JUN 2004
COMPILED:	23 MAR 2018

BEST COPY

ISSUE CLASSIFICATION	
Class	Subclass
709	218

PATENT NUMBER

6757718

U.S. **UTILITY** Patent Application

O.I.P.E.	PATENT DATE
SCANNED ___ Q.A. A.G.	JUN 29 2004

APPLICATION NO.	CONT/PRIOR	CLASS	SUBCLASS	ART UNIT	EXAMINER
09/608872	D	~~704~~ 709	~~216~~ 218	~~2641~~ 2145	~~BACKER~~ Jean

APPLICANTS

Christine Halversen
Luc Julia
Dimitris Voutsas
Adam Cheyer

TITLE

Mobile navigation of network-based electronic information using spoken input

PTO-2040
12/99

ISSUING CLASSIFICATION

ORIGINAL		CROSS REFERENCE(S)						
CLASS	SUBCLASS	CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					
709	218	709	202	217	219	227		
INTERNATIONAL CLASSIFICATION		704	257					
G06F	15/16							

☐ Continued on Issue Slip Inside File Jacket

☐ TERMINAL DISCLAIMER	DRAWINGS			CLAIMS ALLOWED	
	Sheets Drwg.	Figs. Drwg.	Print Fig.	Total Claims	Print Claim for O.G.
	7	7	1A	27	1

☐ The term of this patent subsequent to ___ (date) has been disclaimed.

(Assistant Examiner) (Date)

☐ The term of this patent shall not extend beyond the expiration date of U.S Patent. No. ___

Frantz B. Jean 3/7/03
(Primary Examiner) (Date)

☐ The terminal ___ months of this patent have been disclaimed.

L. Godson 3-13-03
(Legal Instruments Examiner) (Date)

NOTICE OF ALLOWANCE MAILED

3-11-03

ISSUE FEE

Amount Due	Date Paid
$1650.00	5/6/03

ISSUE BATCH NUMBER

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Form PTO-436A
(Rev. 6/99)

FILED WITH: ☐ DISK (CRF) ☐ FICHE ☐ CD-ROM
(Attached in pocket on right inside flap)

ISSUE FEE IN FILE

(FACE)

6,757,718

MOBILE NAVIGATION OF NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN INPUT

Transaction History

Date	Transaction Description
06-30-2000	Preliminary Amendment
06-30-2000	Preliminary Amendment
06-30-2000	Initial Exam Team nn
07-24-2000	IFW Scan & PACR Auto Security Review
08-31-2000	Correspondence Address Change
09-01-2000	Notice Mailed--Application Incomplete--Filing Date Assigned
11-15-2000	Application Dispatched from OIPE
11-15-2000	Application Is Now Complete
11-30-2000	Case Docketed to Examiner in GAU
03-05-2001	Case Docketed to Examiner in GAU
04-20-2001	Non-Final Rejection
04-24-2001	Mail Non-Final Rejection
04-30-2001	Information Disclosure Statement (IDS) Filed
04-30-2001	Information Disclosure Statement (IDS) Filed
05-21-2001	Correspondence Address Change
09-21-2001	Response after Non-Final Action
10-01-2001	Date Forwarded to Examiner
10-01-2001	Change in Power of Attorney (May Include Associate POA)
10-01-2001	Correspondence Address Change
10-01-2001	Change in Power of Attorney (May Include Associate POA)
10-09-2001	Final Rejection
10-10-2001	Mail Final Rejection (PTOL - 326)
01-08-2002	Examiner Interview Summary Record (PTOL - 413)
01-10-2002	Response after Final Action
01-16-2002	Mail Examiner Interview Summary (PTOL - 413)
01-17-2002	Date Forwarded to Examiner
01-28-2002	Mail Advisory Action (PTOL - 303)
01-28-2002	Advisory Action (PTOL-303)
02-08-2002	Request for Continued Examination (RCE)
02-08-2002	Request for Extension of Time - Granted
02-08-2002	Workflow - Request for RCE - Begin
02-11-2002	Date Forwarded to Examiner
02-11-2002	Disposal for a RCE / CPA / R129
02-19-2002	Mail Non-Final Rejection
02-19-2002	Non-Final Rejection
03-26-2002	Case Docketed to Examiner in GAU
03-28-2002	Case Docketed to Examiner in GAU
07-18-2002	Date Forwarded to Examiner
07-18-2002	Response after Non-Final Action
07-18-2002	Request for Extension of Time - Granted
07-29-2002	Information Disclosure Statement (IDS) Filed
07-29-2002	Information Disclosure Statement (IDS) Filed
09-05-2002	Case Docketed to Examiner in GAU
10-01-2002	Non-Final Rejection
10-04-2002	Mail Non-Final Rejection
12-23-2002	Examiner Interview Summary Record (PTOL - 413)
01-06-2003	Response after Non-Final Action
01-08-2003	Date Forwarded to Examiner
01-09-2003	Mail Examiner Interview Summary (PTOL - 413)
03-10-2003	Formal Drawings Required
03-10-2003	Notice of Allowance Data Verification Completed
03-10-2003	Case Docketed to Examiner in GAU
03-11-2003	Mail Notice of Allowance
03-11-2003	Mail Formal Drawings Required
03-13-2003	Dispatch to Publications
05-06-2003	Issue Fee Payment Verified

05-06-2003	Workflow - Drawings Finished
05-06-2003	Workflow - Drawings Matched with File at Contractor
05-06-2003	Workflow - Drawings Received at Contractor
05-06-2003	Workflow - Drawings Sent to Contractor
05-06-2003	Issue Fee Payment Received
03-25-2004	Workflow - File Sent to Contractor
03-25-2004	Receipt into Pubs
03-25-2004	Receipt into Pubs
03-29-2004	Receipt into Pubs
05-03-2004	Receipt into Pubs
05-27-2004	Application Is Considered Ready for Issue
06-01-2004	Receipt into Pubs
06-10-2004	Issue Notification Mailed
06-29-2004	Recordation of Patent Grant Mailed
06-29-2004	Patent Issue Date Used in PTA Calculation
08-16-2006	ENTITY STATUS SET TO UNDISCOUNTED (INITIAL DEFAULT SETTING OR STATUS CHANGE)
04-05-2016	File Marked Found
01-18-2017	File Marked Found
04-12-2017	File Marked Found
06-20-2017	File Marked Found
06-21-2017	File Marked Found
09-20-2017	File Marked Found
09-22-2017	File Marked Found
12-20-2017	Petition Requesting Trial
12-21-2017	Petition Requesting Trial
01-12-2018	Petition Requesting Trial
02-20-2018	Correspondence Address Change

PATENT APPLICATION

09608872

846 U.S. PTO 09/608872

INITIALS 7/12/00 12

4th

CONTENTS

No.	Entry	Date Received (Incl. C. of M.) or Date Mailed
1.	Application papers.	
2.	Ire Ple	8-3-00
3.	Dec Swahaye	11-2-00
4.	Prel. Amdt A	6-30-00
5.	Prel. Amdt B	6-30-00
6.	Rejection 3months	4/24/01
7.	IDS	4-30-01
8.	Associate P/A	5-14-01
9.	Change of address	5-14-01
10.	Ext. of time ②	9-21-01
11.	Revocation & Power of Attorney	9-21-01
12.	Req for reconsideration	9-21-01
13.	notice of acceptance	10-2-01
14.	Final Rejection 3months	10/10/01
15.	Interview Summary	1-16-02
16.	Amdt C	1-10-02
17.	Advisory Action	1-28-02
18.	ext time/month / Request for RCE	2-8-02
19.	Rejection 3months	2-19-02
20.	Interview Summary	
21.	Ext of time (2mos)	7/18/02
22.	Amdt D	7/18/02
23.	IDS	7/19/02
24.	Rejection 3months	10-4-02
25.	Response	1-6-03
26.	Interview Summary	01/08/03
27.	notice of allow.	3/11/03
28.	Formal Drawings (7 shts) set	05-06-03
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ISSUE SLIP STAPLE AREA (for additional cross references)

POSITION	INITIALS	ID NO.	DATE
FEE DETERMINATION	[illegible]	67824	7/12/00
O.I.P.E. CLASSIFIER		48	7/12/00
FORMALITY REVIEW		60871	8/3/00
RESPONSE FORMALITY REVIEW			
		60894	11/15/00

INDEX OF CLAIMS

✓	.... Rejected	N	.... Non-elected
=	.... Allowed	I	.... Interference
—	(Through numeral)... Canceled	A	.... Appeal
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Claim Final	Claim Original	Date
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Claim Final	Claim Original	4/19/01	10/3/01	2/8/02	9/9/02	3/7/03
—	51					—
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If more than 150 claims or 10 actions staple additional sheet here

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SEARCHED

Class	Sub.	Date	Exmr.
709	202	4/6/01	FB
709	218		
707	5		
	3		
	4		
704	257		
updated		9/30/02	[illegible]
updated		3/7/03	[illegible]
704	270.1	3/7/03	[illegible]
	275		
	246		
	257		
709	217		
	219		
	227		

SEARCH NOTES
(INCLUDING SEARCH STRATEGY)

	Date	Exmr.
West search	4/6/01	FB
West, Derwent TDBD, EPO, JPO	9/29/02 9/30/02	[illegible]
consulted with David Wiley	9/30/02	[illegible]
updated	3/7/03	[illegible]
West, Derwent TDBD, EPO, JPO, DG Plus inventor search check for possible double patenting	3/7/03	[illegible]
NPL	3/7/03	[illegible]

INTERFERENCE SEARCHED

Class	Sub.	Date	Exmr.
709	202	3/7/03	[illegible]
	217		
	218		
	219		
	227		
704	257		

(RIGHT OUTSIDE)

* Call Friday early
Monday morning

March 12, 2003

Dear Mr. Jean,

Attached please find the results of your search request for application #09/608,872. I searched Dialog's foreign patent files, technical databases, product announcement files and general files.

Please let me know if you have any questions.

Regards,

Geoffrey St. Leger

Geoffrey St. Leger
4B30/308-7800

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US Patent & Trademark Office

Search Results

Nothing Found

Your search for [receiving and spoken and request and mobile and information and portable and remote control<AND>((journal<IN> pubtype))] did not return any results.

You can try to rerun it within the Portal.

You may revise it and try your search again below or click advanced search for more options.

receiving and spoken and request
and mobile and information and
portable and remote
control<AND>((journal<IN> pubtype)
)

[**Advanced Search**] [**Search Help/Tips**]

Complete Search Help and Tips

The following characters have specialized meaning:

Special Characters	Description
, ( ) [	These characters end a text token.
= > < !	These characters end a text token because they signify the start of a field operator. (! is special: != ends a token.)
` @ \Q < { [!	These characters signify the start of a delimited token. These are terminated by the end character associated with the start character.

Set Name side by side	Query	Hit Count	Set Name result set
	DB=USPT,PGPB,JPAB,EPAB,DWPI,TDBD; PLUR=YES; OP=ADJ		
L3	network same navigation and (mobile or portable) and (speech or spoken) same request$3	56	L3
L2	network same navigation and (mobile or portable) near3 appliance and (speech or spoken) same request	2	L2
L1	network same navigation and (mobile or portable) near3 appliance and (speech or spoken) near4 request	1	L1

END OF SEARCH HISTORY

Set Name side by side	**Query**	**Hit Count**	**Set Name** result set
	DB=USPT,PGPB,JPAB,EPAB,DWPI,TDBD; PLUR=YES; OP=ADJ		
L6	L4 and ((portable near2 remote control$3) or (set adj3 box near4 television))	2	L6
L5	L4 and ((portable near2 remote control$) or ($box near4 television))	2	L5
L4	network same navigation and (mobile or portable) and (speech or spoken) same request$3	84	L4
L3	network same navigation and (mobile or portable) near3 appliance and (speech or spoken) same request	4	L3
L2	network same navigation and (mobile or portable) near3 appliance and (speech or spoken) near4 request	3	L2
L1	6523061.pn.	1	L1

END OF SEARCH HISTORY

US006757718B1

(12) **United States Patent**
Halverson et al.

(10) **Patent No.: US 6,757,718 B1**
(45) **Date of Patent: Jun. 29, 2004**

(54) **MOBILE NAVIGATION OF NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN INPUT**

(75) Inventors: **Christine Halverson**, San Jose, CA (US); **Luc Julia**, Menlo Park, CA (US); **Dimitris Voutsas**, Thessaloniki (GR); **Adam Cheyer**, Palo Alto, CA (US)

(73) Assignee: **SRI International**, Menlo Park, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) bydays.days.

(21) Appl. No.: **09/608,872**

(22) Filed: **Jun. 30, 2000**

Related U.S. Application Data

(63) Continuation of application No. 09/524,095, filed on Mar. 13, 2000, which is a continuation-in-part of application No. 09/225,198, filed on Jan. 5, 1999.

(60) Provisional application No. 60/124,720, filed on Mar. 17, 1999, provisional application No. 60/124,719, filed on Mar. 17, 1999, and provisional application No. 60/124,718, filed on Mar. 17, 1999.

(51) **Int. Cl.**[7] **G06F 15/16**

(52) **U.S. Cl.** **709/218**; 709/202; 709/217; 709/219; 709/227; 704/257

(58) **Field of Search** 709/202, 218, 709/217, 219, 227; 707/5, 3, 4; 704/257, 270.1, 275, 246

(56) **References Cited**

U.S. PATENT DOCUMENTS

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WO	99/50826	10/1999	G10L/3/00
WO	00/05638	2/2000	

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International Search Report, Intl Appl No. PCT/US01/07987.

Stent, Amanda et al., "The CommandTalk Spoken Dialogue System", SRI International.

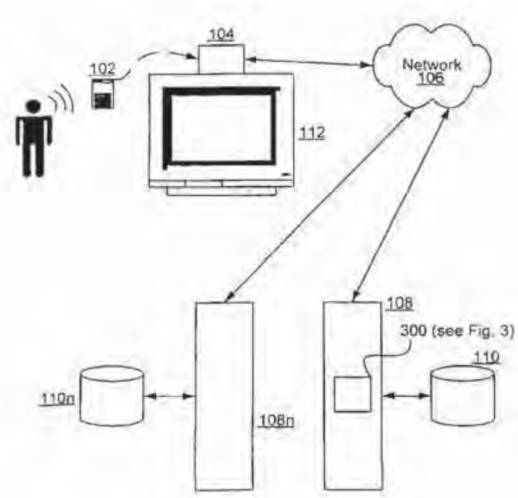
(List continued on next page.)

Primary Examiner—Frantz B Jean
(74) *Attorney, Agent, or Firm*—Moser, Patterson & Sheridan, LLP; Kin-Wah Tong

(57) **ABSTRACT**

A system, method, and article of manufacture are provided for navigating an electronic data source by means of spoken language where a portion of the data link between a mobile information appliance of the user and the data source utilizes wireless communication. When a spoken input request is received from a user who is using the mobile information appliance, it is interpreted. The resulting interpretation of the request is thereupon used to automatically construct an operational navigation query to retrieve the desired information from one or more electronic network data sources, which is transmitted to the mobile information appliance.

27 Claims, 7 Drawing Sheets



U.S. PATENT DOCUMENTS

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6,026,388 A		2/2000	Liddy et al.	707/1
6,102,030 A		8/2000	Brown et al.	704/275
6,173,279 B1	*	1/2001	Levin et al.	707/5
6,192,338 B1	*	2/2001	Haszto et al.	704/257
6,314,365 B1	*	11/2001	Smith	340/988
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6,349,257 B1	*	2/2002	Liu et al.	340/5.6
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OTHER PUBLICATIONS

Moore, Robert et al., "CommandTalk: A Spoken–Language Interface for Battlefield Simulations", Oct. 23, 1997, SRI International.

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http://www.ai.sri.com/~oaa/infowiz.html, InfoWiz: An Animated Voice Interactive Information System, May 8, 2000.

Dowding, John, "Interleaving Syntax and Semantics in an Efficient Bottom–up Parser", SRI International.

Moore, Robert et al., "Combining Linguistic and Statistical Knowledge Sources in Natural–Language Processing for ATIS", SRI International.

Dowding, John et al., "Gemini: A Natural Language System For Spoken–Language Understanding", SRI International.

* cited by examiner

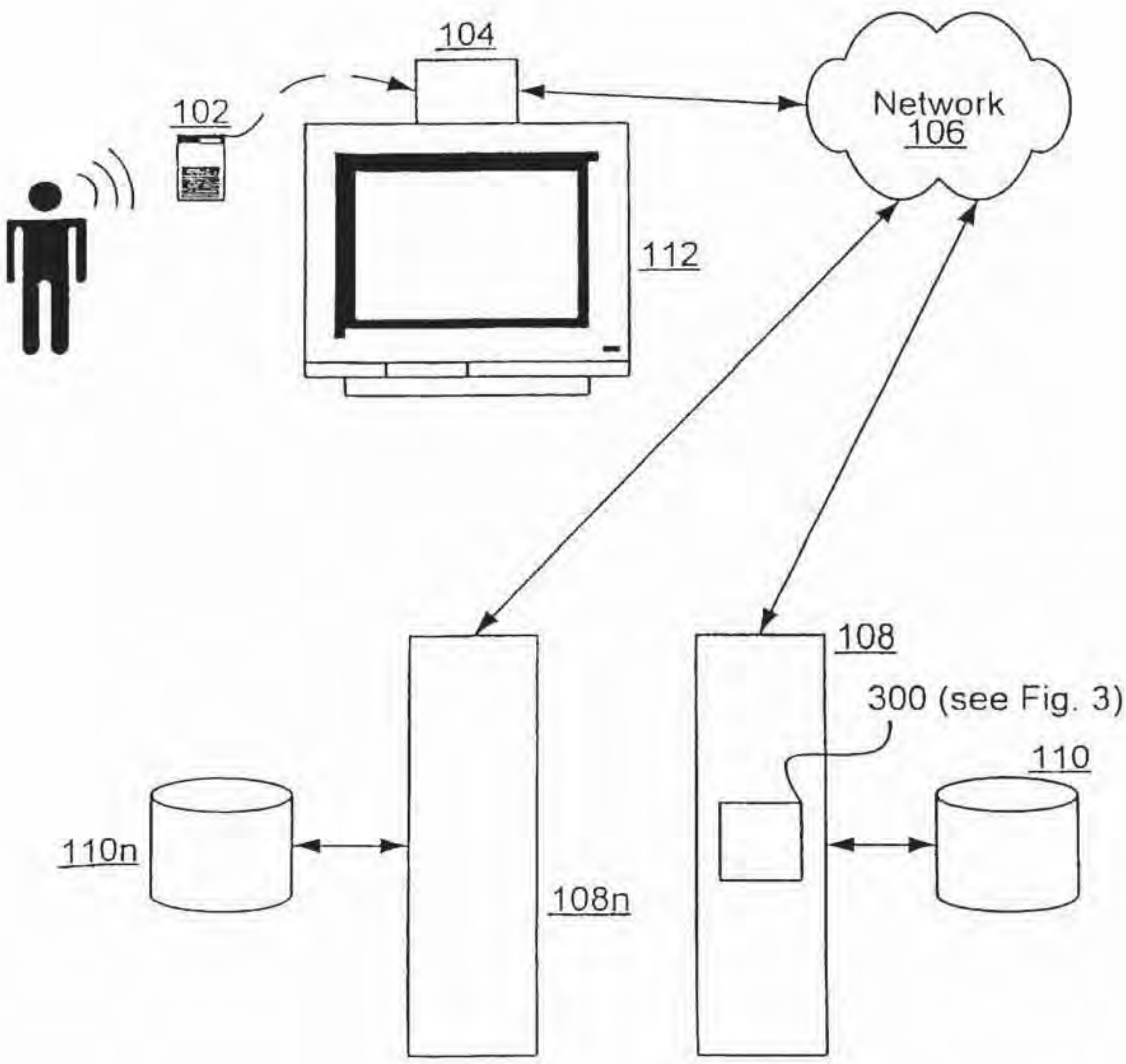


Fig. 1a

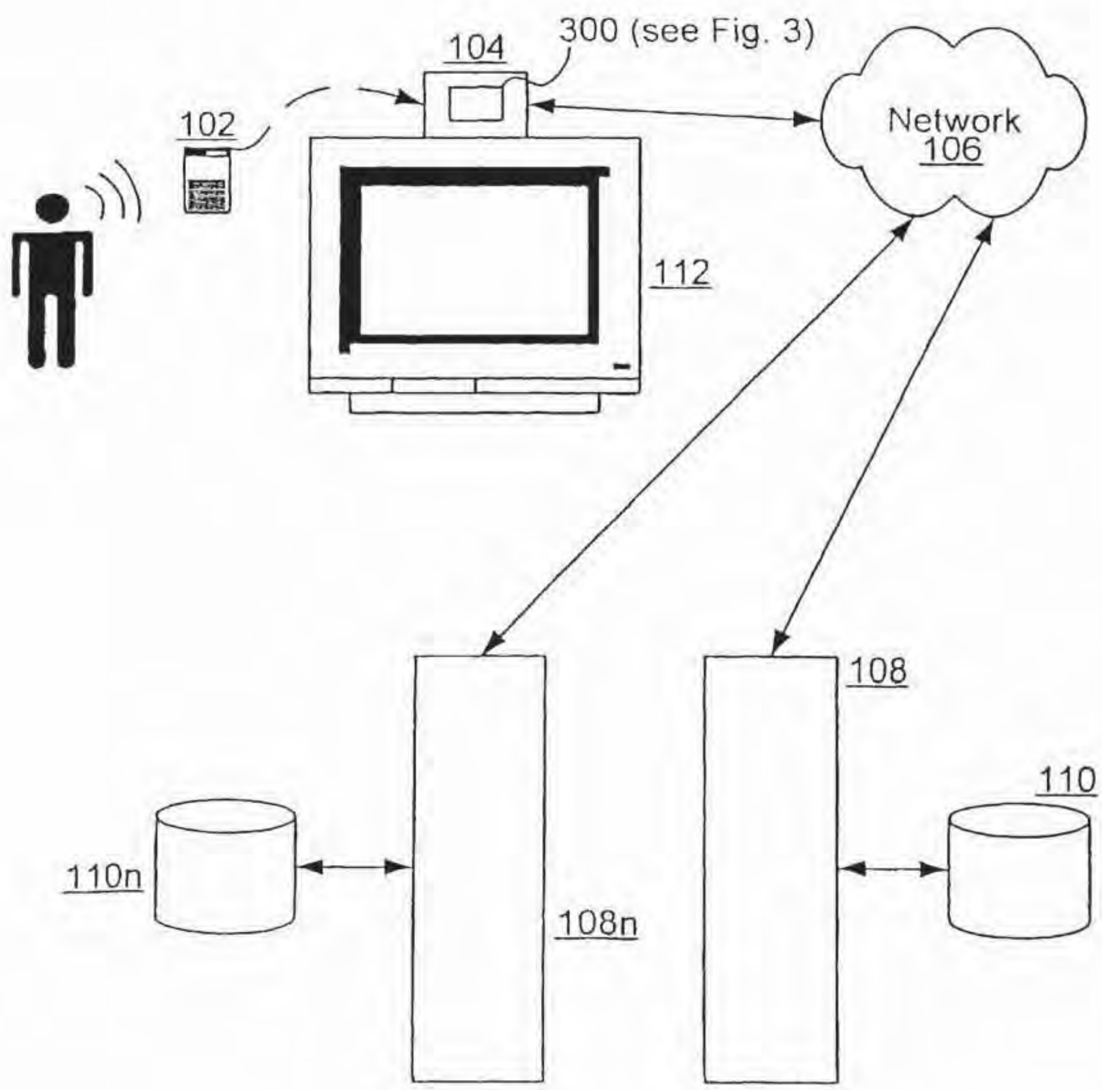


Fig. 1b

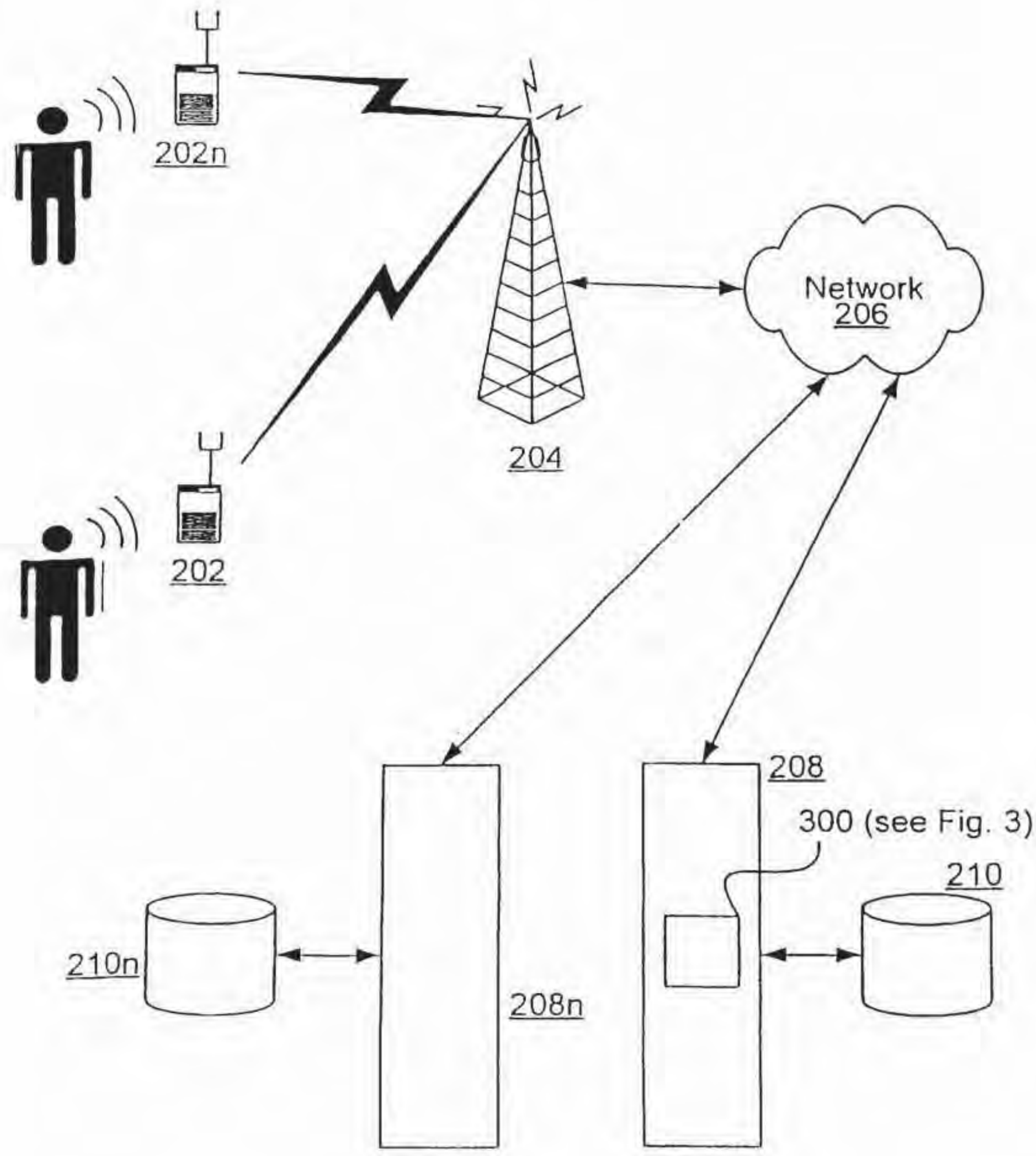


Fig. 2

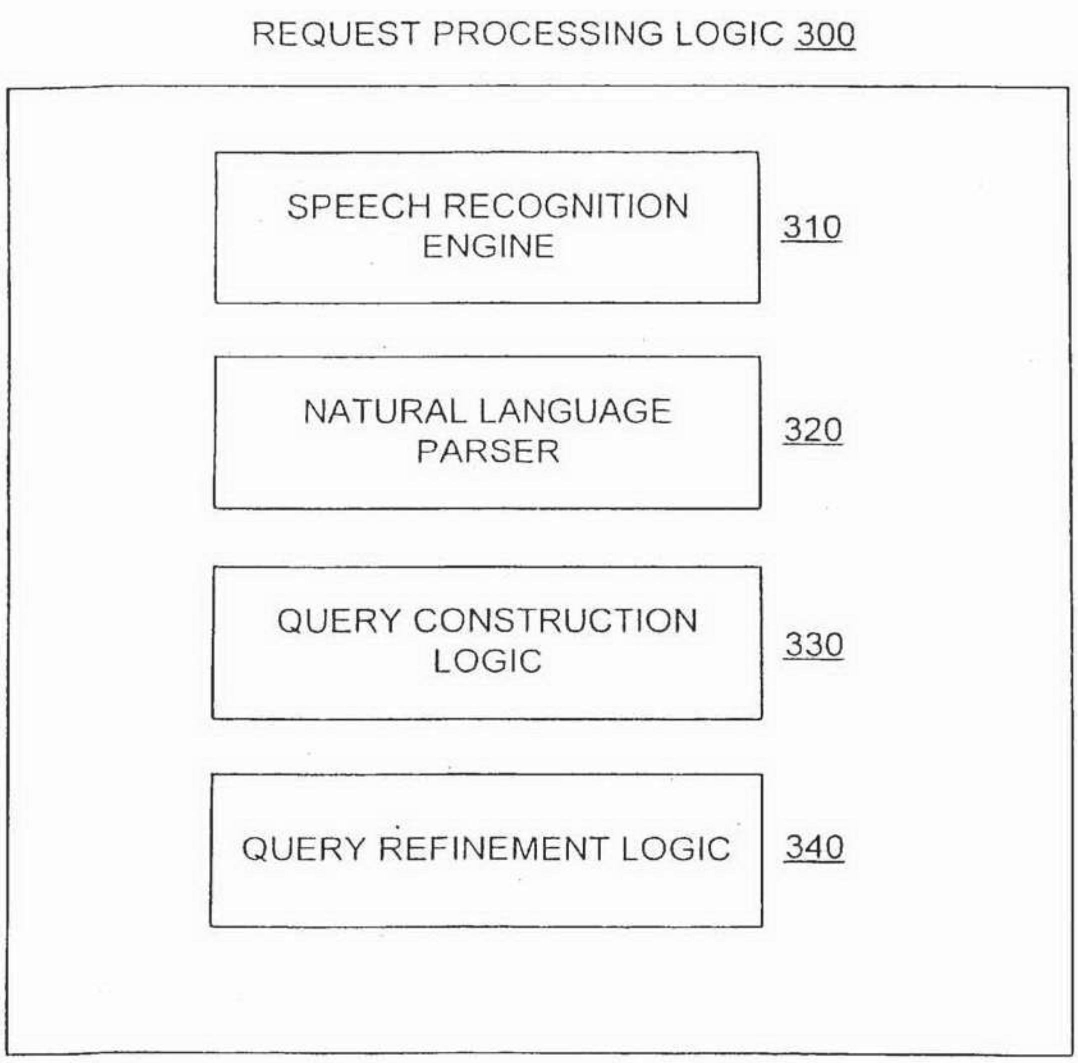

REQUEST PROCESSING LOGIC 300
SPEECH RECOGNITION ENGINE
310
NATURAL LANGUAGE PARSER
320
QUERY CONSTRUCTION LOGIC
330
QUERY REFINEMENT LOGIC
340

Fig. 3

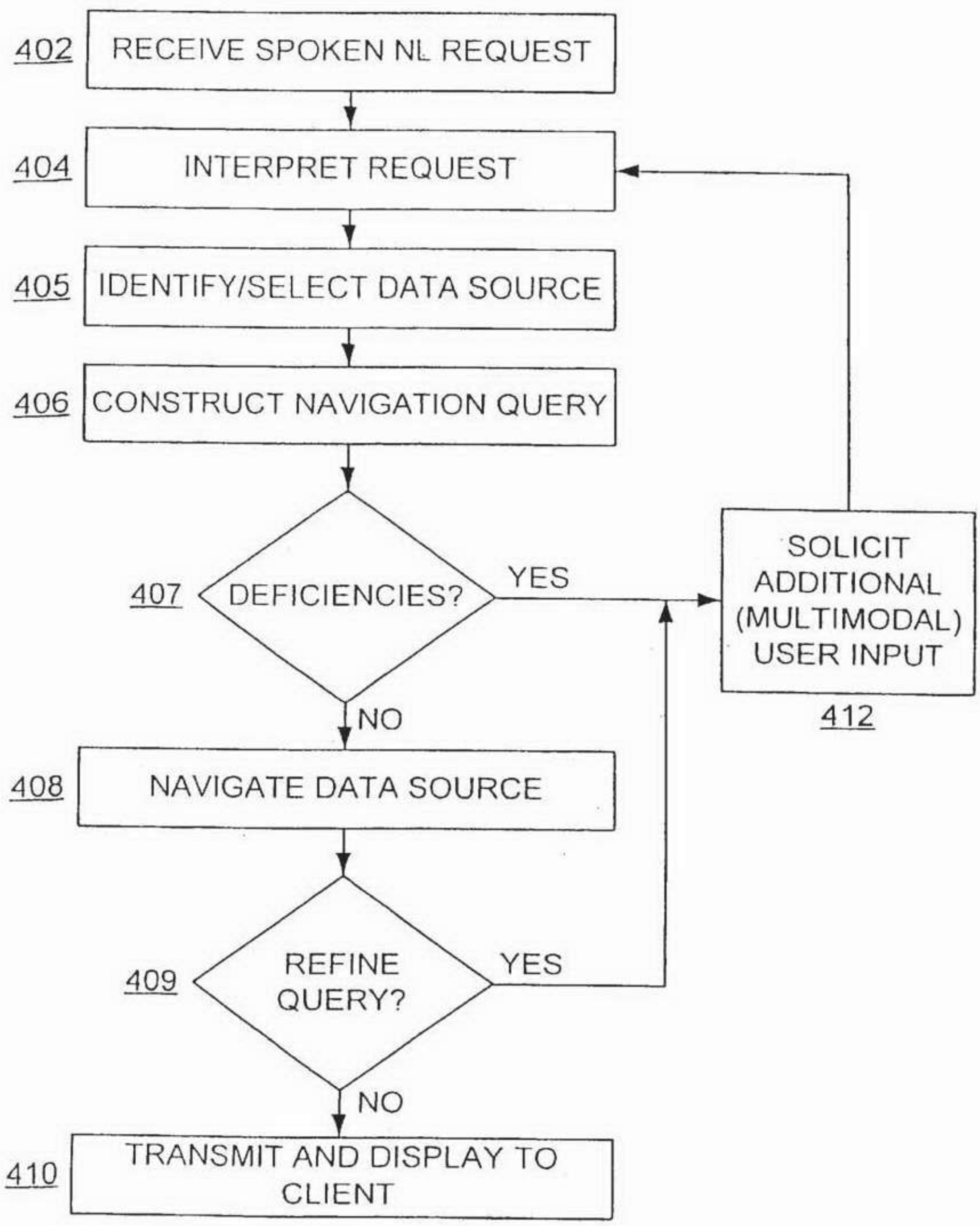

402
RECEIVE SPOKEN NL REQUEST
404
INTERPRET REQUEST
405
IDENTIFY/SELECT DATA SOURCE
406
CONSTRUCT NAVIGATION QUERY
407
DEFICIENCIES?
YES
NO
SOLICIT ADDITIONAL (MULTIMODAL) USER INPUT
412
408
NAVIGATE DATA SOURCE
409
REFINE QUERY?
YES
NO
410
TRANSMIT AND DISPLAY TO CLIENT

Fig. 4

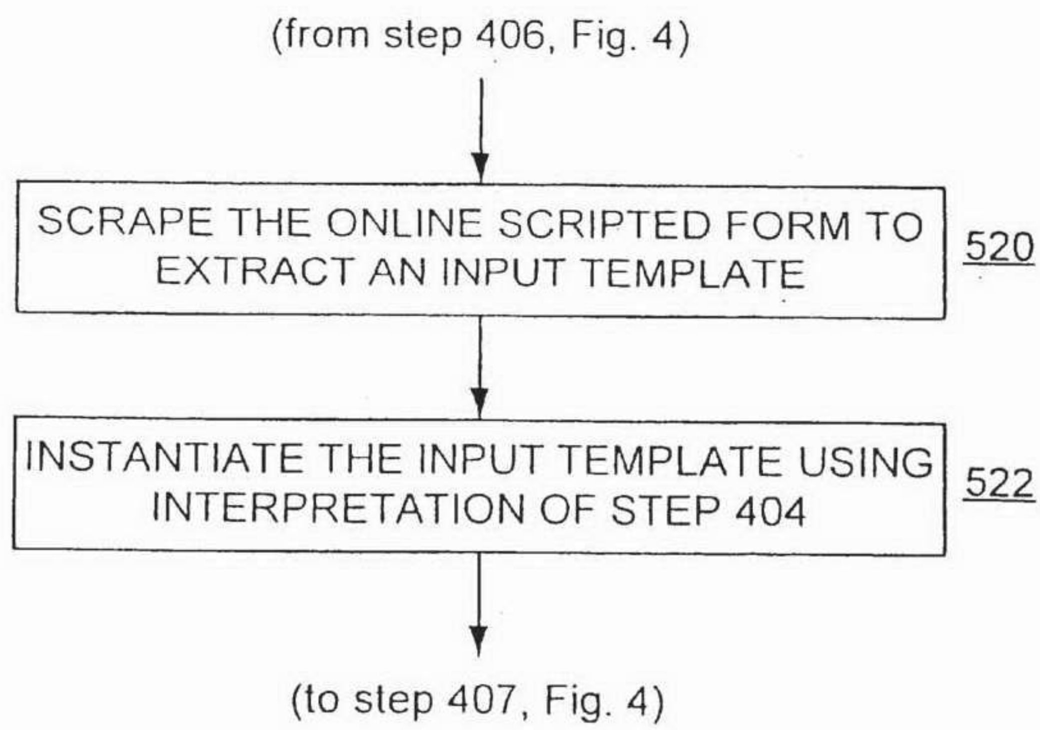
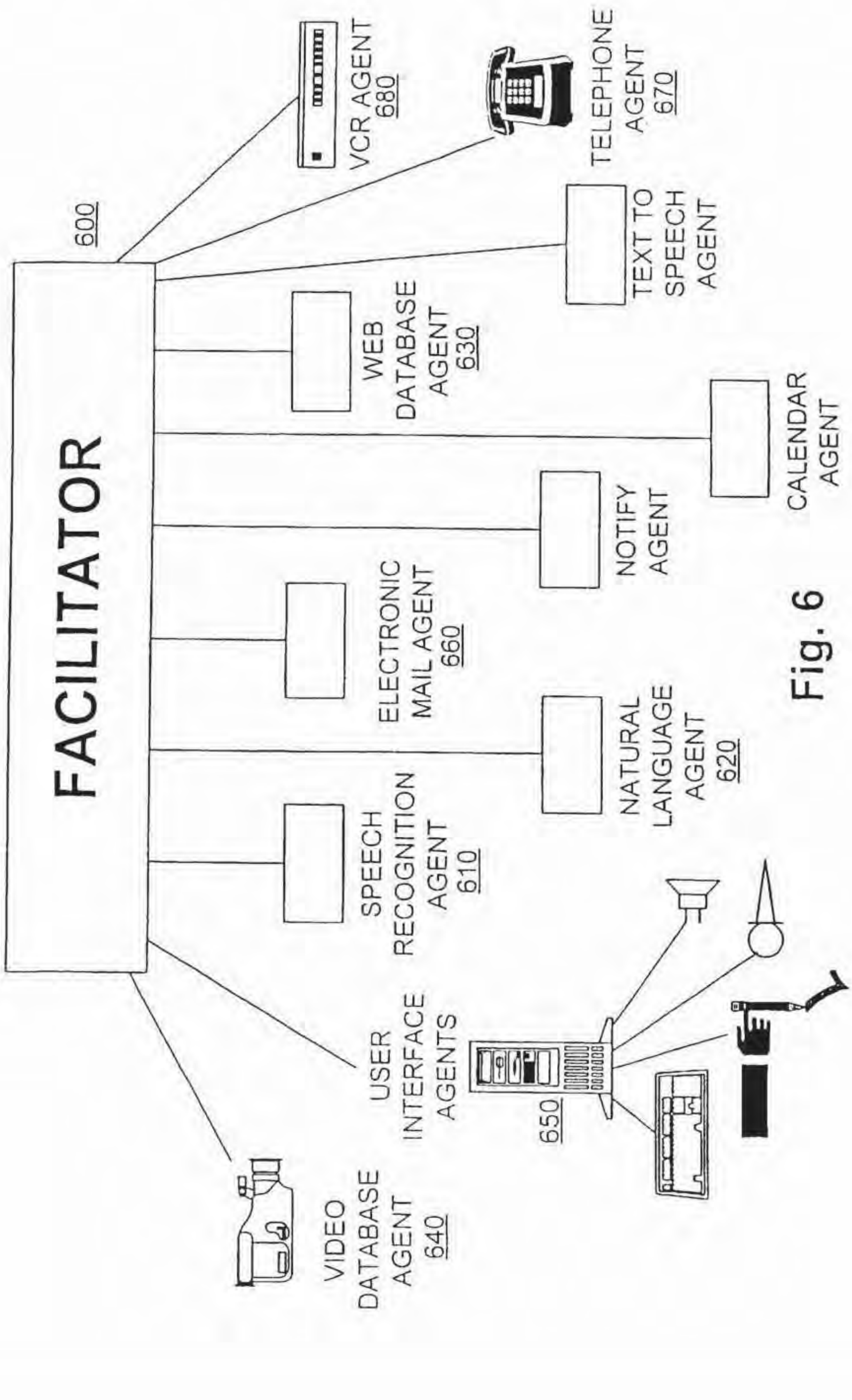

(from step 406, Fig. 4)
SCRAPE THE ONLINE SCRIPTED FORM TO EXTRACT AN INPUT TEMPLATE
520
INSTANTIATE THE INPUT TEMPLATE USING INTERPRETATION OF STEP 404
522
(to step 407, Fig. 4)

Fig. 5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VCR AGENT 680
TELEPHONE AGENT 670
TEXT TO SPEECH AGENT
WEB DATABASE AGENT 630
CALENDAR AGENT
NOTIFY AGENT
ELECTRONIC MAIL AGENT 660
NATURAL LANGUAGE AGENT 620
SPEECH RECOGNITION AGENT 610
USER INTERFACE AGENTS
650
VIDEO DATABASE AGENT 640

Fig. 6

MOBILE NAVIGATION OF NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN INPUT

This application is a continuation of an application entitled NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK which was filed on Mar. 13, 2000 under Ser. No. 09/524,095 and which is a Continuation In Part of co-pending U.S. patent application Ser. No. 09/225,198, filed Jan. 5, 1999, Provisional U.S. patent application Ser. No. 60/124,718, filed Mar. 17, 1999, Provisional U.S. patent application Ser. No. 60/124,720, filed Mar. 17, 1999, and Provisional U.S. patent application Ser. No. 60/124,719, filed Mar. 17, 1999, from which applications priority is claimed and these application are incorporated herein by reference.

BACKGROUND OF THE INVENTION

The present invention relates generally to the navigation of electronic data by means of spoken natural language requests, and to feedback mechanisms and methods for resolving the errors and ambiguities that may be associated with such requests.

As global electronic connectivity continues to grow, and the universe of electronic data potentially available to users continues to expand, there is a growing need for information navigation technology that allows relatively naive users to navigate and access desired data by means of natural language input. In many of the most important markets—including the home entertainment arena, as well as mobile computing—spoken natural language input is highly desirable, if not ideal. As just one example, the proliferation of high-bandwidth communications infrastructure for the home entertainment market (cable, satellite, broadband) enables delivery of movies-on-demand and other interactive multimedia content to the consumer's home television set. For users to take full advantage of this content stream ultimately requires interactive navigation of content databases in a manner that is too complex for user-friendly selection by means of a traditional remote-control clicker. Allowing spoken natural language requests as the input modality for rapidly searching and accessing desired content is an important objective for a successful consumer entertainment product in a context offering a dizzying range of database content choices. As further examples, this same need to drive navigation of (and transaction with) relatively complex data warehouses using spoken natural language requests applies equally to surfing the Internet/Web or other networks for general information, multimedia content, or e-commerce transactions.

In general, the existing navigational systems for browsing electronic databases and data warehouses (search engines, menus, etc.), have been designed without navigation via spoken natural language as a specific goal. So today's world is full of existing electronic data navigation systems that do not assume browsing via natural spoken commands, but rather assume text and mouse-click inputs (or in the case of TV remote controls, even less). Simply recognizing voice commands within an extremely limited vocabulary and grammar—the spoken equivalent of button/click input (e.g., speaking "channel 5" selects TV channel 5)—is really not sufficient by itself to satisfy the objectives described above. In order to deliver a true "win" for users, the voice-driven front-end must accept spoken natural language input in a

manner that is intuitive to users. For example, the front-end should not require learning a highly specialized command language or format. More fundamentally, the front-end must allow users to speak directly in terms of what the user ultimately wants —e.g., "I'd like to see a Western film directed by Clint Eastwood" —as opposed to speaking in terms of arbitrary navigation structures (e.g., hierarchical layers of menus, commands, etc.) that are essentially artifacts reflecting constraints of the pre-existing text/click navigation system. At the same time, the front-end must recognize and accommodate the reality that a stream of naive spoken natural language input will, over time, typically present a variety of errors and/or ambiguities: e.g., garbled/unrecognized words (did the user say "Eastwood" or "Easter"?) and under-constrained requests ("Show me the Clint Eastwood movie"). An approach is needed for handling and resolving such errors and ambiguities in a rapid, user-friendly, non-frustrating manner.

What is needed is a methodology and apparatus for rapidly constructing a voice-driven front-end atop an existing, non-voice data navigation system, whereby users can interact by means of intuitive natural language input not strictly conforming to the step-by-step browsing architecture of the existing navigation system, and wherein any errors or ambiguities in user input are rapidly and conveniently resolved. The solution to this need should be compatible with the constraints of a multi-user, distributed environment such as the Internet/Web or a proprietary high-bandwidth content delivery network; a solution contemplating one-at-a-time user interactions at a single location is insufficient, for example.

SUMMARY OF THE INVENTION

The present invention addresses the above needs by providing a system, method, and article of manufacture for mobile navigation of network-based electronic data sources in response to spoken input requests. When a spoken input request is received from a user using a mobile information appliance that communicates with a network server via an at least partially wireless communications system, it is interpreted, such as by using a speech recognition engine to extract speech data from acoustic voice signals, and using a language parser to linguistically parse the speech data. The interpretation of the spoken request can be performed on a computing device locally with the user, such as the mobile information appliance, or remotely from the user. The resulting interpretation of the request is thereupon used to automatically construct an operational navigation query to retrieve the desired information from one or more electronic network data sources, which is then transmitted to a client device of the user. If the network data source is a database, the navigation query is constructed in the format of a database query language.

Typically, errors or ambiguities emerge in the interpretation of the spoken request, such that the system cannot instantiate a complete, valid navigational template. This is to be expected occasionally, and one preferred aspect of the invention is the ability to handle such errors and ambiguities in relatively graceful and user-friendly manner. Instead of simply rejecting such input and defaulting to traditional input modes or simply asking the user to try again, a preferred embodiment of the present invention seeks to converge rapidly toward instantiation of a valid navigational template by soliciting additional clarification from the user as necessary, either before or after a navigation of the data source, via multimodal input, i.e., by means of menu selection or other input modalities including and in addition to spoken input. This clarifying, multi-modal dialogue takes advantage of whatever partial navigational information has been gleaned from the initial interpretation of the user's spoken request. This clarification process continues until the system converges toward an adequately instantiated navigational template, which is in turn used to navigate the network-based data and retrieve the user's desired information. The retrieved information is transmitted across the network and presented to the user on a suitable client display device.

In a further aspect of the present invention, the construction of the navigation query includes extracting an input template for an online scripted interface to the data source and using the input template to construct the navigation query. The extraction of the input template can include dynamically scraping the online scripted interface.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention, together with further advantages thereof, may best be understood by reference to the following description taken in conjunction with the accompanying drawings in which:

FIG. **1***a* illustrates a system providing a spoken natural language interface for network-based information navigation, in accordance with an embodiment of the present invention with server-side processing of requests;

FIG. **1***b* illustrates another system providing a spoken natural language interface for network-based information navigation, in accordance with an embodiment of the present invention with client-side processing of requests;

FIG. **2** illustrates a system providing a spoken natural language interface for network-based information navigation, in accordance with an embodiment of the present invention for a mobile computing scenario;

FIG. **3** illustrates the functional logic components of a request processing module in accordance with an embodiment of the present invention;

FIG. **4** illustrates a process utilizing spoken natural language for navigating an electronic database in accordance with one embodiment of the present invention;

FIG. **5** illustrates a process for constructing a navigational query for accessing an online data source via an interactive, scripted (e.g., CGI) form; and

FIG. **6** illustrates an embodiment of the present invention utilizing a community of distributed, collaborating electronic agents.

DETAILED DESCRIPTION OF THE INVENTION

1. System Architecture

a. Server-End Processing of Spoken Input

FIG. **1***a* is an illustration of a data navigation system driven by spoken natural language input, in accordance with one embodiment of the present invention. As shown, a user's voice input data is captured by a voice input device **102**, such as a microphone. Preferably voice input device **102** includes a button or the like that can be pressed or held-down to activate a listening mode, so that the system need not continually pay attention to, or be confused by, irrelevant background noise. In one preferred embodiment well-suited for the home entertainment setting, voice input device **102** is a portable remote control device with an integrated microphone, and the voice data is transmitted from device **102** preferably via infrared (or other wireless) link to communications box **104** (e.g., a set-top box or a similar communications device that is capable of retransmitting the raw voice data and/or processing the voice data) local to the user's environment and coupled to communications network **106**. The voice data is then transmitted across network **106** to a remote server or servers **108**. The voice data may preferably be transmitted in compressed digitized form, or alternatively—particularly where bandwidth constraints are significant—in analog format (e.g., via frequency modulated transmission), in the latter case being digitized upon arrival at remote server **108**.

At remote server **108**, the voice data is processed by request processing logic **300** in order to understand the user's request and construct an appropriate query or request for navigation of remote data source **110**, in accordance with the interpretation process exemplified in FIG. **4** and FIG. **5** and discussed in greater detail below. For purposes of executing this process, request processing logic **300** comprises functional modules including speech recognition engine **310**, natural language (NL) parser **320**, query construction logic **330**, and query refinement logic **340**, as shown in FIG. **3**. Data source **110** may comprise database(s), Internet/web site(s), or other electronic information repositories, and preferably resides on a central server or servers—which may or may not be the same as server **108**, depending on the storage and bandwidth needs of the application and the resources available to the practitioner. Data source **110** may include multimedia content, such as movies or other digital video and audio content, other various forms of entertainment data, or other electronic information. The contents of data source **110** are navigated—i.e., the contents are accessed and searched, for retrieval of the particular information desired by the user—using the processes of FIGS. **4** and **5** as described in greater detail below.

Once the desired information has been retrieved from data source **110**, it is electronically transmitted via network **106** to the user for viewing on client display device **112**. In a preferred embodiment well-suited for the home entertainment setting, display device **112** is a television monitor or similar audiovisual entertainment device, typically in stationary position for comfortable viewing by users. In addition, in such preferred embodiment, display device **112** is coupled to or integrated with a communications box (which is preferably the same as communications box **104**, but may also be a separate unit) for receiving and decoding/formatting the desired electronic information that is received across communications network **106**.

Network **106** is a two-way electronic communications network and may be embodied in electronic communication infrastructure including coaxial (cable television) lines, DSL, fiber-optic cable, traditional copper wire (twisted pair), or any other type of hardwired connection. Network **106** may also include a wireless connection such as a satellite-based connection, cellular connection, or other type of wireless connection. Network **106** may be part of the Internet and may support TCP/IP communications, or may be embodied in a proprietary network, or in any other electronic communications network infrastructure, whether packet-switched or connection-oriented. A design consideration is that network **106** preferably provide suitable bandwidth depending upon the nature of the content anticipated for the desired application.

b. Client-End Processing of Spoken Input

FIG. **1***b* is an illustration of a data navigation system driven by spoken natural language input, in accordance with a second embodiment of the present invention. Again, a user's voice input data is captured by a voice input device

102, such as a microphone. In the embodiment shown in FIG. **1***b*, the voice data is transmitted from device **202** to requests processing logic **300**, hosted on a local speech processor, for processing and interpretation. In the preferred embodiment illustrated in FIG. **1***b*, the local speech processor is conveniently integrated as part of communications box **104**, although implementation in a physically separate (but communicatively coupled) unit is also possible as will be readily apparent to those of skill in the art. The voice data is processed by the components of request processing logic **300** in order to understand the user's request and construct an appropriate query or request for navigation of remote data source **110**, in accordance with the interpretation process exemplified in FIGS. **4** and **5** as discussed in greater detail below.

The resulting navigational query is then transmitted electronically across network **106** to data source **110**, which preferably resides on a central server or servers **108**. As in FIG. **1***a*, data source **110** may comprise database(s), Internet/web site(s), or other electronic information repositories, and preferably may include multimedia content, such as movies or other digital video and audio content, other various forms of entertainment data, or other electronic information. The contents of data source **110** are then navigated—i.e., the contents are accessed and searched, for retrieval of the particular information desired by the user—preferably using the process of FIGS. **4** and **5** as described in greater detail below. Once the desired information has been retrieved from data source **110**, it is electronically transmitted via network **106** to the user for viewing on client display device **112**.

In one embodiment in accordance with FIG. **1***b* and well-suited for the home entertainment setting, voice input device **102** is a portable remote control device with an integrated microphone, and the voice data is transmitted from device **102** preferably via infrared (or other wireless) link to the local speech processor. The local speech processor is coupled to communications network **106**, and also preferably to client display device **112** (especially for purposes of query refinement transmissions, as discussed below in connection with FIG. **4**, step **412**), and preferably may be integrated within or coupled to communications box **104**. In addition, especially for purposes of a home entertainment application, display device **112** is preferably a television monitor or similar audiovisual entertainment device, typically in stationary position for comfortable viewing by users. In addition, in such preferred embodiment, display device **112** is coupled to a communications box (which is preferably the same as communications box **104**, but may also be a physically separate unit) for receiving and decoding/formatting the desired electronic information that is received across communications network **106**.

Design considerations favoring server-side processing and interpretation of spoken input requests, as exemplified in FIG. **1***a*, include minimizing the need to distribute costly computational hardware and software to all client users in order to perform speech and language processing. Design considerations favoring client-side processing, as exemplified in FIG. **1***b*, include minimizing the quantity of data sent upstream across the network from each client, as the speech recognition is performed before transmission across the network and only the query data and/or request needs to be sent, thus reducing the upstream bandwidth requirements.

c. Mobile Client Embodiment

A mobile computing embodiment of the present invention may be implemented by practitioners as a variation on the embodiments of either FIG. **1***a* or FIG. **1***b*. For example, as depicted in FIG. **2**, a mobile variation in accordance with the server-side processing architecture illustrated in FIG. **1***a* may be implemented by replacing voice input device **102**, communications box **104**, and client display device **112**, with an integrated, mobile, information appliance **202** such as a cellular telephone or wireless personal digital assistant (wireless PDA). Mobile information appliance **202** essentially performs the functions of the replaced components. Thus, mobile information appliance **202** receives spoken natural language input requests from the user in the form of voice data, and transmits that data (preferably via wireless data receiving station **204**) across communications network **206** for server-side interpretation of the request, in similar fashion as described above in connection with FIG. **1**. Navigation of data source **210** and retrieval of desired information likewise proceeds in an analogous manner as described above. Display information transmitted electronically back to the user across network **206** is displayed for the user on the display of information appliance **202**, and audio information is output through the appliance's speakers.

Practitioners will further appreciate, in light of the above teachings, that if mobile information appliance **202** is equipped with sufficient computational processing power, then a mobile variation of the client-side architecture exemplified in FIG. **2** may similarly be implemented. In that case, the modules corresponding to request processing logic **300** would be embodied locally in the computational resources of mobile information appliance **202**, and the logical flow of data would otherwise follow in a manner analogous to that previously described in connection with FIG. **1***b*.

As illustrated in FIG. **2**, multiple users, each having their own client input device, may issue requests, simultaneously or otherwise, for navigation of data source **210**. This is equally true (though not explicitly drawn) for the embodiments depicted in FIGS. **1***a* and **1***b*. Data source **210** (or **100**), being a network accessible information resource, has typically already been constructed to support access requests from simultaneous multiple network users, as known by practitioners of ordinary skill in the art. In the case of server-side speech processing, as exemplified in FIGS. **1***a* and **2**, the interpretation logic and error correction logic modules are also preferably designed and implemented to support queuing and multi-tasking of requests from multiple simultaneous network users, as will be appreciated by those of skill in the art.

It will be apparent to those skilled in the art that additional implementations, permutations and combinations of the embodiments set forth in FIGS. **1***a*, **1***b*, and **2** may be created without straying from the scope and spirit of the present invention. For example, practitioners will understand, in light of the above teachings and design considerations, that it is possible to divide and allocate the functional components of request processing logic **300** between client and server. For example, speech recognition—in entirety, or perhaps just early stages such as feature extraction—might be performed locally on the client end, perhaps to reduce bandwidth requirements, while natural language parsing and other necessary processing might be performed upstream on the server end, so that more extensive computational power need not be distributed locally to each client. In that case, corresponding portions of request processing logic **300**, such as speech recognition engine **310** or portions thereof, would reside locally at the client as in FIG. **1***b*, while other component modules would be hosted at the server end as in FIGS. **1***a* and **2**.

Further, practitioners may choose to implement the each of the various embodiments described above on any number of different hardware and software computing platforms and environments and various combinations thereof, including, by way of just a few examples: a general-purpose hardware microprocessor such as the Intel Pentium series; operating system software such as Microsoft Windows/CE, Palm OS, or Apple Mac OS (particularly for client devices and client-side processing), or Unix, Linux, or Windows/NT (the latter three particularly for network data servers and server-side processing), and/or proprietary information access platforms such as Microsoft's WebTV or the Diva Systems video-on-demand system.

2. Processing Methodology

The present invention provides a spoken natural language interface for interrogation of remote electronic databases and retrieval of desired information. A preferred embodiment of the present invention utilizes the basic methodology outlined in the flow diagram of FIG. **4** in order to provide this interface. This methodology will now be discussed.

a. Interpreting Spoken Natural Language Requests

At step **402**, the user's spoken request for information is initially received in the form of raw (acoustic) voice data by a suitable input device, as previously discussed in connection with FIGS. **1–2**. At step **404** the voice data received from the user is interpreted in order to understand the user's request for information. Preferably this step includes performing speech recognition in order to extract words from the voice data, and further includes natural language parsing of those words in order to generate a structured linguistic representation of the user's request.

Speech recognition in step **404** is performed using speech recognition engine **310**. A variety of commercial quality, speech recognition engines are readily available on the market, as practitioners will know. For example, Nuance Communications offers a suite of speech recognition engines, including Nuance 6, its current flagship product, and Nuance Express, a lower cost package for entry-level applications. As one other example, IBM offers the ViaVoice speech recognition engine, including a low-cost shrink-wrapped version available through popular consumer distribution channels. Basically, a speech recognition engine processes acoustic voice data and attempts to generate a text stream of recognized words.

Typically, the speech recognition engine is provided with a vocabulary lexicon of likely words or phrases that the recognition engine can match against its analysis of acoustical signals, for purposes of a given application. Preferably, the lexicon is dynamically adjusted to reflect the current user context, as established by the preceding user inputs. For example, if a user is engaged in a dialogue with the system about movie selection, the recognition engine's vocabulary may preferably be adjusted to favor relevant words and phrases, such as a stored list of proper names for popular movie actors and directors, etc. Whereas if the current dialogue involves selection and viewing of a sports event, the engine's vocabulary might preferably be adjusted to favor a stored list of proper names for professional sports teams, etc. In addition, a speech recognition engine is provided with language models that help the engine predict the most likely interpretation of a given segment of acoustical voice data, in the current context of phonemes or words in which the segment appears. In addition, speech recognition engines often echo to the user, in more or less real-time, a transcription of the engine's best guess at what the user has said, giving the user an opportunity to confirm or reject.

In a further aspect of step **404**, natural language interpreter (or parser) **320** linguistically parses and interprets the textual output of the speech recognition engine. In a preferred embodiment of the present invention, the natural-language interpreter attempts to determine both the meaning of spoken words (semantic processing) as well as the grammar of the statement (syntactic processing), such as the Gemini Natural Language Understanding System developed by SRI International. The Gemini system is described in detail in publications entitled "Gemini: A Natural Language System for Spoken-Language Understanding" and "Interleaving Syntax and Semantics in an Efficient Bottom-Up Parser," both of which are currently available online at http://www.ai.sri.com/natural-language/projects/arpa-sls/nat-lang.html. (Copies of those publications are also included in an information disclosure statement submitted herewith, and are incorporated herein by this reference). Briefly, Gemini applies a set of syntactic and semantic grammar rules to a word string using a bottom-up parser to generate a logical form, which is a structured representation of the context-independent meaning of the string. Gemini can be used with a variety of grammars, including general English grammar as well as application-specific grammars. The Gemini parser is based on "unification grammar," meaning that grammatical categories incorporate features that can be assigned values; so that when grammatical category expressions are matched in the course of parsing or semantic interpretation, the information contained in the features is combined, and if the feature values are incompatible the match fails.

It is possible for some applications to achieve a significant reduction in speech recognition error by using the natural-language processing system to re-score recognition hypotheses. For example, the grammars defined for a language parser like Gemini may be compiled into context-free grammar that, in turn, can be used directly as language models for speech recognition engines like the Nuance recognizer. Further details on this methodology are provided in the publication "Combining Linguistic and Statistical Knowledge Sources in Natural-Language Processing for ATIS" which is currently available online through http://www.ai.sri.com/natural-language/projects/arpa-sls/spnl-int.html. A copy of this publication is included in an information disclosure submitted herewith, and is incorporated herein by this reference.

In an embodiment of the present invention that may be preferable for some applications, the natural language interpreter "learns" from the past usage patterns of a particular user or of groups of users. In such an embodiment, the successfully interpreted requests of users are stored, and can then be used to enhance accuracy by comparing a current request to the stored requests, thereby allowing selection of a most probable result.

b. Constructing Navigation Queries

In step **405** request processing logic **300** identifies and selects an appropriate online data source where the desired information (in this case, current weather reports for a given city) can be found. Such selection may involve look-up in a locally stored table, or possibly dynamic searching through an online search engine, or other online search techniques. For some applications, an embodiment of the present invention may be implemented in which only access to a particular data source (such as a particular vendor's proprietary content database) is supported; in that case, step **405** may be trivial or may be eliminated entirely.

Step **406** attempts to construct a navigation query, reflecting the interpretation of step **404**. This operation is preferably performed by query construction logic **330**.

A "navigation query" means an electronic query, form, series of menu selections, or the like; being structured appropriately so as to navigate a particular data source of interest in search of desired information. In other words, a navigation query is constructed such that it includes whatever content and structure is required in order to access desired information electronically from a particular database or data source of interest.

For example, for many existing electronic databases, a navigation query can be embodied using a formal database query language such as Standard Query Language (SQL). For many databases, a navigation query can be constructed through a more user-friendly interactive front-end, such as a series of menus and/or interactive forms to be selected or filled in. SQL is a standard interactive and programming language for getting information from and updating a database. SQL is both an ANSI and an ISO standard. As is well known to practitioners, a Relational Database Management System (RDBMS), such as Microsoft's Access, Oracle's Oracle**7**, and Computer Associates' CA-OpenIngres, allow programmers to create, update, and administer a relational database. Practitioners of ordinary skill in the art will be thoroughly familiar with the notion of database navigation through structured query, and will be readily able to appreciate and utilize the existing data structures and navigational mechanisms for a given database, or to create such structures and mechanisms where desired.

In accordance with the present invention, the query constructed in step **406** must reflect the user's request as interpreted by the speech recognition engine and the NL parser in step **404**. In embodiments of the present invention wherein data source **110** (or **210** in the corresponding embodiment of FIG. **2**) is a structured relational database or the like, step **406** of the present invention may entail constructing an appropriate Structured Query Language (SQL) query or the like, or automatically filling out a front-end query form, series of menus or the like, as described above.

In many existing Internet (and Intranet) applications, an online electronic data source is accessible to users only through the medium of interaction with a so-called Common Gateway Interface (CGI) script. Typically the user who visits a web site of this nature must fill in the fields of an online interactive form. The online form is in turn linked to a CGI script, which transparently handles actual navigation of the associated data source and produces output for viewing by the user's web browser. In other words, direct user access to the data source is not supported, only mediated access through the form and CGI script is offered.

For applications of this nature, an advantageous embodiment of the present invention "scrapes" the scripted online site where information desired by a user may be found in order to facilitate construction of an effective navigation query. For example, suppose that a user's spoken natural language request is: "What's the weather in Miami?" After this request is received at step **402** and interpreted at step **404**, assume that step **405** determines that the desired weather information is available online through the medium of a CGI-scripted interactive form. Step **406** is then preferably carried out using the expanded process diagrammed in FIG. **5**. In particular, at sub-step **520**, query construction logic **330** electronically "scrapes" the online interactive form, meaning that query construction logic **330** automatically extracts the format and structure of input fields accepted by the online form. At sub-step **522**, a navigation query is then constructed by instantiating (filling in) the extracted input format—essentially an electronic template—in a manner reflecting the user's request for information as interpreted in step **404**. The flow of control then returns to step **407** of FIG. **4**. Ultimately, when the query thus constructed by scraping is used to navigate the online data source in step **408**, the query effectively initiates the same scripted response as if a human user had visited the online site and had typed appropriate entries into the input fields of the online form.

In the embodiment just described, scraping step **520** is preferably carried out with the assistance of an online extraction utility such as WebL. WebL is a scripting language for automating tasks on the World Wide Web. It is an imperative, interpreted language that has built-in support for common web protocols like HTTP and FTP, and popular data types like HTML and XML. WebL's implementation language is Java, and the complete source code is available from Compaq. In addition, step **520** is preferably performed dynamically when necessary—in other words, on-the-fly in response to a particular user query—but in some applications it may be possible to scrape relatively stable (unchanging) web sites of likely interest in advance and to cache the resulting template information.

It will be apparent, in light of the above teachings, that preferred embodiments of the present invention can provide a spoken natural language interface atop an existing, non-voice data navigation system, whereby users can interact by means of intuitive natural language input not strictly conforming to the linear browsing architecture or other artifacts of an existing menu/text/click navigation system. For example, users of an appropriate embodiment of the present invention for a video-on-demand application can directly speak the natural request: "Show me the movie 'Unforgiven'"—instead of walking step-by-step through a typically linear sequence of genre/title/actor/director menus, scrolling and selecting from potentially long lists on each menu, or instead of being forced to use an alphanumeric keyboard that cannot be as comfortable to hold or use as a lightweight remote control. Similarly, users of an appropriate embodiment of the present invention for a web-surfing application in accordance with the process shown in FIG. **5** can directly speak the natural request: "Show me a one-month price chart for Microsoft stock" —instead of potentially having to navigate to an appropriate web site, search for the right ticker symbol, enter/select the symbol, and specify display of the desired one-month price chart, each of those steps potentially involving manual navigation and data entry to one or more different interaction screens. (Note that these examples are offered to illustrate some of the potential benefits offered by appropriate embodiments of the present invention, and not to limit the scope of the invention in any respect.)

c. Error Correction

Several problems can arise when attempting to perform searches based on spoken natural language input. As indicated at decision step **407** in the process of FIG. **4**, certain deficiencies may be identified during the process of query construction, before search of the data source is even attempted. For example, the user's request may fail to specify enough information in order to construct a navigation query that is specific enough to obtain a satisfactory search result. For example, a user might orally request "what's the weather?" whereas the national online data source identified in step **405** and scraped in step **520** might require specifying a particular city.

Additionally, certain deficiencies and problems may arise following the navigational search of the data source at step **408**, as indicated at decision step **409** in FIG. **4**. For example, with reference to a video-on-demand application, a user may wish to see the movie "Unforgiven", but perhaps the user can't recall name of the film, but knows it was directed by and starred actor Clint Eastwood. A typical video-on-demand database might indeed be expected to allow queries specifying the name of a leading actor and/or director, but in the case of this query—as in many cases—that will not be enough to narrow the search to a single film, and additional user input in some form is required.

In the event that one or more deficiencies in the user's spoken request, as processed, result in the problems described, either at step **407** or **409**, some form of error handling is in order. A straightforward, crude technique might be for the system to respond simply "input not understood/insufficient, please try again." However, that approach will likely result in frustrated users, and is not optimal or even acceptable for most applications. Instead, a preferred technique in accordance with the present invention handles such errors and deficiencies in user input at step **412**, whether detected at step **407** or step **409**, by soliciting additional input from the user in a manner taking advantage of the partial construction already performed and via user interface modalities in addition to spoken natural language ("multi-modality"). This supplemental interaction is preferably conducted through client display device **112** (**202**, in the embodiment of FIG. **2**), and may include textual, graphical, audio and/or video media. Further details and examples are provided below. Query refinement logic **340** preferably carries out step **412**. The additional input received from the user is fed into and augments interpreting step **404**, and query construction step **406** is likewise repeated with the benefit of the augmented interpretation. These operations, and subsequent navigation step **408**, are preferably repeated until no remaining problems or deficiencies are identified at decision points **407** or **409**. Further details and examples for this query refinement process are provided immediately below.

Consider again the example in which the user of a video-on-demand application wishes to see "Unforgiven" but can only recall that it was directed by and starred Clint Eastwood. First, it bears noting that using a prior art navigational interface, such as a conventional menu interface, will likely be relatively tedious in this case. The user can proceed through a sequence of menus, such as Genre (select "western"), Title (skip), Actor ("Clint Eastwood"), and Director ("Clint Eastwood"). In each case—especially for the last two items—the user would typically scroll and select from fairly long lists in order to enter his or her desired name, or perhaps use a relatively couch-unfriendly keypad to manually type the actor's name twice.

Using a preferred embodiment of the present invention, the user instead speaks aloud, holding remote control microphone **102**, "I want to see that movie starring and directed by Clint Eastwood. Can't remember the title." At step **402** the voice data is received. At step **404** the voice data is interpreted. At step **405** an appropriate online data source is selected (or perhaps the system is directly connected to a proprietary video-on-demand provider). At step **406** a query is automatically constructed by the query construction logic **330** specifying "Clint Eastwood" in both the actor and director fields. Step **407** detects no obvious problems, and so the query is electronically submitted and the data source is navigated at step **408**, yielding a list of several records satisfying the query (e.g., "Unforgiven", "True Crime", "Absolute Power", etc.). Step **409** detects that additional user input is needed to further refine the query in order to select a particular film for viewing.

At that point, in step **412** query refinement logic **340** might preferably generate a display for client display device **112** showing the (relatively short) list of film titles that satisfy the user's stated constraints. The user can then preferably use a relatively convenient input modality, such as buttons on the remote control, to select the desired title from the menu. In a further preferred embodiment, the first title on the list is highlighted by default, so that the user can simply press an "OK" button to choose that selection. In a further preferred feature, the user can mix input modalities by speaking a response like "I want number one on the list." Alternatively, the user can preferably say, "Let's see Unforgiven," having now been reminded of the title by the menu display.

Utilizing the user's supplemental input, request processing logic **300** iterates again through steps **404** and **406**, this time constructing a fully-specified query that specifically requests the Eastwood film "Unforgiven." Step **408** navigates the data source using that query and retrieves the desired film, which is then electronically transmitted in step **410** from network server **108** to client display device **112** via communications network **106**.

Now consider again the example in which the user of a web surfing application wants to know his or her local weather, and simply asks, "what's the weather?" At step **402** the voice data is received. At step **404** the voice data is interpreted. At step **405** an online web site providing current weather information for major cities around the world is selected. At step **406** and sub-step **520**, the online site is scraped using a WebL-style tool to extract an input template for interacting with the site. At sub-step **522**, query construction logic **330** attempts to construct a navigation query by instantiating the input template, but determines (quite rightly) that a required field—name of city—cannot be determined from the user's spoken request as interpreted in step **404**. Step **407** detects this deficiency, and in step **412** query refinement logic **340** preferably generates output for client display device **112** soliciting the necessary supplemental input. In a preferred embodiment, the output might display the name of the city where the user is located highlighted by default. The user can then simply press an "OK" button—or perhaps mix modalities by saying "yes, exactly" —to choose that selection. A preferred embodiment would further display an alphabetical scrollable menu listing other major cities, and/or invite the user to speak or select the name of the desired city.

Here again, utilizing the user's supplemental input, request processing logic **300** iterates through steps **404** and **406**. This time, in performing sub-step **520**, a cached version of the input template already scraped in the previous iteration might preferably be retrieved. In sub-step **522**, query construction logic **330** succeeds this time in instantiating the input template and constructing an effective query, since the desired city has now been clarified. Step **408** navigates the data source using that query and retrieves the desired weather information, which is then electronically transmitted in step **410** from network server **108** to client display device **112** via communications network **106**.

It is worth noting that in some instances, there may be details that are not explicitly provided by the user, but that query construction logic **330** or query refinement logic **340** may preferably deduce on their own through reasonable assumptions, rather than requiring the use to provide explicit clarification. For example, in the example previously described regarding a request for a weather report, in some applications it might be preferable for the system to simply assume that the user means a weather report for his or her home area and to retrieve that information, if the cost of doing so is not significantly greater than the cost of asking the user to clarify the query. Making such an assumption might be even more strongly justified in a preferred embodiment, as described earlier, where user histories are tracked, and where such history indicates that a particular user or group of users typically expect local information when asking for a weather forecast. At any rate, in the event such an assumption is made, if the user actually intended to request the weather for a different city, the user would then need to ask his or her question again. It will be apparent to practitioners, in light of the above teachings, that the choice of whether to program query construction logic **330** and query refinement logic **340** to make make particular assumptions will typically involve trade-offs involving user conveience that can be assessed in the context of specific applications.

3. Open Agent Architecture (OAA®)

Open Agent Architecture™ (OAA®) is a software platform, developed by the assignee of the present invention, that enables effective, dynamic collaboration among communities of distributed electronic agents. OAA is described in greater detail in co-pending U.S. patent application Ser. No. 09/225,198, which has been incorporated herein by reference. Very briefly, the functionality of each client agent is made available to the agent community through registration of the client agent's capabilities with a facilitator. A software "wrapper" essentially surrounds the underlying application program performing the services offered by each client. The common infrastructure for constructing agents is preferably supplied by an agent library. The agent library is preferably accessible in the runtime environment of several different programming languages. The agent library preferably minimizes the effort required to construct a new system and maximizes the ease with which legacy systems can be "wrapped" and made compatible with the agent-based architecture of the present invention. When invoked, a client agent makes a connection to a facilitator, which is known as its parent facilitator. Upon connection, an agent registers with its parent facilitator a specification of the capabilities and services it can provide, using a high-level, declarative Interagent Communication Language ("ICL") to express those capabilities. Tasks are presented to the facilitator in the form of ICL goal expressions. When a facilitator determines that the registered capabilities of one of its client agents will help satisfy a current goal or sub-goal thereof, the facilitator delegates that sub-goal to the client agent in the form of an ICL request. The client agent processes the request and returns answers or information to the facilitator. In processing a request, the client agent can use ICL to request services of other agents, or utilize other infrastructure services for collaborative work. The facilitator coordinates and integrates the results received from different client agents on various sub-goals, in order to satisfy the overall goal.

OAA provides a useful software platform for building systems that integrate spoken natural language as well as other user input modalities. For example, see the above-referenced co-pending patent application, especially FIG. **13** and the corresponding discussion of a "multi-modal maps" application, and FIG. **12** and the corresponding discussion of a "unified messaging" application. Another example is the InfoWiz interactive information kiosk developed by the assignee and described in the document entitled "InfoWiz: An Animated Voice Interactive Information System" available online at http://www.ai.sri.com/~oaa/applications.html. A copy of the InfoWhiz document is provided in an Information Disclosure Statement submitted herewith and incorporated herein by this reference. A further example is the "CommandTalk" application developed by the assignee for the U.S. military, as described online at http://www.ai.sri.com/~lesaf/commandtalk.html and in the following publications, copies of which are provided in an Information Disclosure Statement submitted herewith and incorporated herein by this reference:

"CommandTalk: A Spoken-Language Interface for Battlefield Simulations", 1997, by Robert Moore, John Dowding, Harry Bratt, J. Mark Gawron, Yonael Gorfu and Adam Cheyer, in "Proceedings of the Fifth Conference on Applied Natural Language Processing", Washington, D.C., pp. 1–7, Association for Computational Linguistics

"The CommandTalk Spoken Dialogue System", 1999, by Amanda Stent, John Dowding, Jean Mark Gawron, Elizabeth Owen Bratt and Robert Moore, in "Proceedings of the Thirty-Seventh Annual Meeting of the ACL", pp. 183–190, University of Maryland, College Park, Md., Association for Computational Linguistics

"Interpreting Language in Context in CommandTalk", 1999, by John Dowding and Elizabeth Owen Bratt and Sharon Goldwater, in "Communicative Agents: The Use of Natural Language in Embodied Systems", pp. 63–67, Association for Computing Machinery (ACM) Special Interest Group on Artificial Intelligence (SIGART), Seattle, Wash.

For some applications and systems, OAA can provide an advantageous platform for constructing embodiments of the present invention. For example, a representative application is now briefly presented, with reference to FIG. **6**. If the statement "show me movies starring John Wayne" is spoken into the voice input device, the voice data for this request will be sent by UI agent **650** to facilitator **600**, which in turn will ask natural language (NL) agent **620** and speech recognition agent **610** to interpret the query and return the interpretation in ICL format. The resulting ICL goal expression is then routed by the facilitator to appropriate agents—in this case, video-on-demand database agent **640**—to execute the request. Video database agent **640** preferably includes or is coupled to an appropriate embodiment of query construction logic **330** and query refinement logic **340**, and may also issue ICL requests to facilitator **600** for additional assistance—e.g., display of menus and capture of additional user input in the event that query refinement is needed—and facilitator **600** will delegate such requests to appropriate client agents in the community. When the desired video content is ultimately retrieved by video database agent **640**, UI agent **650** is invoked by facilitator **600** to display the movie.

Other spoken user requests, such as a request for the current weather in New York City or for a stock quote, would eventually lead facilitator to invoke web database agent **630** to access the desired information from an appropriate Internet site. Here again, web database agent **630** preferably includes or is coupled to an appropriate embodiment of query construction logic **330** and query refinement logic **340**, including a scraping utility such as WebL. Other spoken requests, such as a request to view recent emails or access voice mail, would lead the facilitator to invoke the appropriate email agent **660** and/or telephone agent **680**. A request to record a televised program of interest might lead facilitator **600** to invoke web database agent **630** to return televised program schedule information, and then invoke VCR controller agent **680** to program the associated VCR unit to record the desired television program at the scheduled time.

Control and connectivity embracing additional electronic home appliances (e.g., microwave oven, home surveillance system, etc.) can be integrated in comparable fashion. Indeed, an advantage of OAA-based embodiments of the present invention, that will be apparent to practitioners in light of the above teachings and in light of the teachings disclosed in the cited co-pending patent applications, is the relative ease and flexibility with which additional service agents can be plugged into the existing platform, immediately enabling the facilitator to respond dynamically to spoken natural language requests for the corresponding services.

4. Further Embodiments and Equivalents

While the present invention has been described in terms of several preferred embodiments, there are many alterations, permutations, and equivalents that may fall within the scope of this invention. It should also be noted that there are many alternative ways of implementing the methods and apparatuses of the present invention. It is therefore intended that the following appended claims be interpreted as including all such alterations, permutations, and equivalents as fall within the true spirit and scope of the present invention.

What is claimed is:

1. A method for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, wherein a data link is established between a mobile information appliance of the user and the one or more network servers, comprising the steps of:

(a) receiving a spoken request for desired information from the user utilizing the mobile information appliance of the user, wherein said mobile information appliance comprises a portable remote control device or a set-top box for a television;

(b) rendering an interpretation of the spoken request;

(c) constructing a navigation query based upon the interpretation;

(d) utilizing the navigation query to select a portion of the electronic data source; and

(e) transmitting the selected portion of the electronic data source from the network server to the mobile information appliance of the user.

2. The method of claim **1**, wherein the step of rendering the interpretation of the spoken request is performed by the mobile information appliance.

3. The method of claim **1**, wherein the step of rendering the interpretation of the spoken request is performed by the mobile information appliance.

4. The method of claim **1**, further comprising the steps of soliciting additional input from the user, including user interaction in a modality different than the original request; refining the navigation query, based upon the additional input; and using the refined navigation query to select a portion of the electronic data source.

5. The method of claim **1**, wherein the data link includes a cellular telephone system.

6. The method of claim **1**, wherein steps (a)-(d) are performed with respect to multiple users.

7. The method of claim **1**, wherein the mobile information appliance is a wireless telephone.

8. The method of claim **1**, wherein the mobile information appliance is a portable computing device.

9. The method of claim **8**, wherein the portable computing device is a personal digital assistant.

10. A computer program embodied on a computer readable medium for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, wherein a data link is established between a mobile information appliance of the user and the one or more network servers, comprising:

(a) a code segment that receives a spoken request for desired information from the user utilizing the mobile information appliance of the user, wherein said mobile information appliance comprises a portable remote control device or a set-top box for a television;

(b) a code segment that renders an interpretation of the spoken request;

(c) a code segment that constructs a navigation query based upon the interpretation;

(d) a code segment that utilizes the navigation query to select a portion of the electronic data source; and

(e) a code segment that transmits the selected portion of the electronic data source from the network server to the mobile information appliance of the user.

11. The computer program of claim **10**, wherein the rendering of the interpretation of the spoken request is performed at the one or more network servers.

12. The computer program of claim **10**, wherein the rendering of the interpretation of the spoken request is performed by the mobile information appliance.

13. The computer program of claim **10**, further comprising a code segment that solicits additional input from the user, including user interaction in a modality different than the original request; a code segment that refines the navigation query, based upon the additional input; and a code segment that uses the refined navigation query to select a portion of the electronic data source.

14. The computer program of claim **10**, wherein the data link includes a wireless telephone system.

15. The computer program of claim **10**, wherein code segments (a)-(d) are executed with respect to multiple users.

16. The computer program of claim **10**, wherein the mobile information appliance is a wireless telephone.

17. The computer program of claim **10**, wherein the mobile information appliance is a portable computing device.

18. The computer program of claim **17**, wherein the portable computing device is a personal digital assistant.

19. A system for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, comprising:

(a) a mobile information appliance operable to receive a spoken request for desired information from the user, wherein said mobile information appliance comprises a portable remote control device or a set-top box for a television;

(b) spoken language processing logic, operable to render an interpretation of the spoken request;

(c) query construction logic, operable to construct a navigation query based upon the interpretation;

(d) navigation logic, operable to select a portion of the electronic data source using the navigation query, and

(e) electronic communications infrastructure for transmitting the selected portion of the electronic data source from the network server to the mobile information appliance of the user.

20. The system of claim **19**, wherein the spoken language processing logic renders the interpretation of the spoken request at the one or more network servers.

21. The system of claim **19**, wherein the spoken language processing logic renders the interpretation of the spoken request at the mobile information appliance.

22. The system of claim **19**, further comprising user interaction logic operable to solicit additional input from the user, including user interaction in a modality different than the original request; and query refining logic operable to refine the navigation query based upon the additional input; wherein the navigation logic users the refined navigation query to select a portion of the electronic data source.

23. The system of claim **19**, wherein the data link includes a cellular telephone system.

24. The system of claim **19**, wherein the system operates with respect to multiple users.

25. The system of claim **19**, wherein the mobile information appliance is a wireless telephone.

26. The system of claim **19**, wherein the mobile information appliance is a portable computing device.

27. The system of claim **26**, wherein the portable computing device is a personal digital assistant.

* * * * *

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UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. 20231
www.uspto.gov

Bib Data Sheet

CONFIRMATION NO. 2382

SERIAL NUMBER	FILING DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
09/608,872	06/30/2000 RULE	709	2155	SRIIp037B

APPLICANTS

Christine Halversen, San Jose, CA;
Luc Julia, Menlo Park, CA;
Dimitris Voutsas, Thessaloniki, GREECE;
Adam Cheyer, Palo Alto, CA;

** CONTINUING DATA *************************

THIS APPLICATION IS A CON OF 09/524,095 03/13/2000
WHICH IS A CIP OF 09/225,198 01/05/1999
WHICH CLAIMS BENEFIT OF 60/124,718 03/17/1999
AND SAID 09/524,095 03/13/2000
CLAIMS BENEFIT OF 60/124,720 03/17/1999
AND CLAIMS BENEFIT OF 60/124,719 03/17/1999

** FOREIGN APPLICATIONS ********************

IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** SMALL ENTITY **
** 08/31/2000

	STATE OR COUNTRY	SHEETS DRAWING	TOTAL CLAIMS	INDEPENDENT CLAIMS
Foreign Priority claimed ☐ yes ☑ no 35 USC 119 (a-d) conditions met ☐ yes ☑ no ☐ Met after Allowance Verified and Acknowledged — Examiner's Signature — Initials	CA	7	27	3

ADDRESS

THOMASON, MOSER & PATTERSON, LLP
595 SHREWSBURY AVENUE
SUITE 100
SHREWSBURY , NJ 07702

TITLE

mobile navigation of network-based electronic information using spoken input

FILING FEE RECEIVED	FEES	
473	FEES: Authority has been given in Paper No. _________ to charge/credit DEPOSIT ACCOUNT No. _________ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other ___________ ☐ Credit

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Bib Data Sheet

SERIAL NUMBER	FILING DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
09/608,872	06/30/2000 RULE	704	2741	SRIlp037B

APPLICANTS

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Adam Cheyer, Palo Alto, CA ;

** CONTINUING DATA ********************** yes FJ

THIS APPLICATION IS A CON OF 09/524,095 03/13/2000
WHICH IS A CIP OF 09/225,198 01/05/1999
WHICH CLAIMS BENEFIT OF 60/124,718 03/17/1999
WHICH CLAIMS BENEFIT OF 60/124,719 03/17/1999
WHICH CLAIMS BENEFIT OF 60/124,720 03/17/1999

** FOREIGN APPLICATIONS ******************** None FJ

IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 08/31/2000

** SMALL ENTITY **

	STATE OR COUNTRY	SHEETS DRAWING	TOTAL CLAIMS	INDEPENDENT CLAIMS
Foreign Priority claimed ☐ yes ☒ no 35 USC 119 (a-d) conditions met ☐ yes ☒ no ☐ Met after Allowance Verified and Acknowledged FJ Examiner's Signature FJ Initials	CA	7	27	3

ADDRESS

24277

TITLE

Mobile navigation of network-based electronic information using spoken input

FILING FEE RECEIVED	FEES: Authority has been given in Paper	
473	No. ______ to charge/credit DEPOSIT ACCOUNT No. ______ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other ______ ☐ Credit

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PATENT APPLICATION SERIAL NO. ____________________

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE
FEE RECORD SHEET

07/12/2000 PALLEN 00000020 09608872

01 FC:201 345.00 OP
02 FC:203 63.00 OP

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*U.S. GPO: 1999-459-082/19144

07-03-00

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4-2001
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF EXPRESS MAILING
I hereby certify that this paper and the documents and/or fees referred to as attached therein are being deposited with the United States Postal Service on June 30, 2000 in an envelope as "Express Mail Post Office to Addressee" service under 37 CFR §1.10, Mailing Label Number EK858788212US, addressed to the Assistant Commissioner for Patents, Washington, DC 20231.

Kevin J. Zilka

Attorney Docket No.: SRI1P037B

First Named Inventor:

HALVERSEN, Christine

UTILITY PATENT APPLICATION TRANSMITTAL (37 CFR. § 1.53(b))

(Continuation, Divisional or Continuation-in-part application)

Assistant Commissioner for Patents
Box Patent Application
Washington, DC 20231

☐ Duplicate for fee processing

Sir: This is a request for filing a patent application under 37 CFR. § 1.53(b) in the name of inventors: Christine Halversen, Luc Julia, Dimitris Voutsas, Adam Cheyer

For: MOBILE NAVIGATION OF NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN INPUT

This application is a ☒ Continuation ☐ Divisional ☐ Continuation-in-part

of prior Application No.: **09/524,095**, from which priority under 35 U.S.C. §120 is claimed.

Application Elements:

☒ 33 Pages of Specification, Claims and Abstract
☒ 07 Sheets of Drawings
☐ Declaration
☐ Newly executed (original or copy)
☐ Copy from a prior application (37 CFR 1.63(d) for a continuation or divisional).
The entire disclosure of the prior application from which a copy of the declaration is herein supplied is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.
☐ Deletion of inventors Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).

Accompanying Application Parts:

☐ Assignment and Assignment Recordation Cover Sheet (recording fee of $40.00 enclosed)
☐ Power of Attorney
☐ 37 CFR 3.73(b) Statement by Assignee

☐ Information Disclo: Statement with Form PTO-1449 ☐)pies of IDS Citations

☒ Preliminary Amendment

☒ Return Receipt Postcard

☐ Small Entity Statement(s) ☒ Statement filed in prior application. Status still proper and desired.

☐ Other:

Claim For Foreign Priority

☐ Priority of ________ Application No. __________ filed on __________ is claimed under 35 U.S.C. § 119.

☐ The certified copy has been filed in prior application U.S. Application No. _______

☐ The certified copy will follow.

Extension of Time for Prior Pending Application

☐ A Petition for Extension of Time is being concurrently filed in the prior pending application. A copy of the Petition for Extension of Time is attached.

Amendments

☐ Amend the specification by inserting before the first line the sentence: "This is a

☐ Continuation ☐ Continuation-in-part ☐ Divisional

application of copending prior

☐ Application No.__________ filed on __________,

☐ International Application __________ filed on __________ which designated the United States,

the disclosure of which is incorporated herein by reference."

☒ Cancel in this application original claims 2-55 of the prior application before calculating the filing fee. (*At least one original independent claim must be retained.*)

Fee Calculation (37 CFR § 1.16)

	(Col. 1) NO. FILED	(Col. 2) NO. EXTRA	SMALL ENTITY RATE	FEE	OR	LARGE ENTITY RATE	FEE
BASIC FEE			$345	$ 345	OR	$690	$
TOTAL CLAIMS	27 -20 =	7	x09 =	$ 63	OR	x18 =	$
INDEP CLAIMS	3 -03 =	0	x39 =	$	OR	x78 =	$
[ ] Multiple Dependent Claim Presented			$130 =	$	OR	$260 =	$
* If the difference in Col. 1 is less than zero, enter "0" in Col. 2.			Total	$ 408	OR	Total	$

☒ Check No. 137 in the amount of $ 408.00 is enclosed.

☒ The Commissioner is autho to charge any fees beyond the amount ised which may be required, or to credit any overpayment, to Deposit Account No. 50-1351 (Order No. SRI1P037B).

General Authorization for Petition for Extension of Time (37 CFR §1.136)

☒ Applicants hereby make and generally authorize any Petitions for Extensions of Time as may be needed for any subsequent filings. The Commissioner is also authorized to charge any extension fees under 37 CFR §1.17 as may be needed to Deposit Account No. 50-1351 (Order No. SRI1P037B).

☒ Please send correspondence to the following address:

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Date: June 30, 2000

Kevin J. Zilka
Registration No. 41,429

09/608872
U.S. PTO
jc846
06/30/00

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF EXPRESS MAILING
I hereby certify that this paper and the documents and/or fees referred to as attached therein are being deposited with the United States Postal Service on June 30, 2000 in an envelope as "Express Mail Post Office to Addressee" service under 37 CFR §1.10, Mailing Label Number EK858788212US, addressed to the Assistant Commissioner for Patents, Washington, DC 20231.

Kevin J. Zilka

Attorney Docket No.: SRI1P037B

First Named Inventor:

HALVERSEN, Christine

UTILITY PATENT APPLICATION TRANSMITTAL (37 CFR. § 1.53(b))
(Continuation, Divisional or Continuation-in-part application)

Assistant Commissioner for Patents
Box Patent Application
Washington, DC 20231

☒ Duplicate for fee processing

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For: MOBILE NAVIGATION OF NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN INPUT

This application is a ☒ Continuation ☐ Divisional ☐ Continuation-in-part

of prior Application No.: **09/524,095**, from which priority under 35 U.S.C. §120 is claimed.

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☐ Information Discl...re Statement with Form PTO-1449 ☐ Copies of IDS Citations
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☒ Return Receipt Postcard
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☐ Priority of ________ Application No. _________ filed on __________ is claimed under 35 U.S.C. § 119.

☐ The certified copy has been filed in prior application U.S. Application No. _______
☐ The certified copy will follow.

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Amendments

☐ Amend the specification by inserting before the first line the sentence: "This is a

☐ Continuation ☐ Continuation-in-part ☐ Divisional
application of copending prior
☐ Application No.__________ filed on _____________,
☐ International Application _________ filed on _________ which designated the United States,
the disclosure of which is incorporated herein by reference."

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BASIC FEE			$345	$ 345	OR	$690	$
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☒ Please send correspondence to the following address:

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Direct Telephone Calls To: **Kevin J. Zilka at telephone number (408) 505-5100**

Date: June 30, 2000

Kevin J. Zilka
Registration No. 41,429

Navigating Network-Based Electronic Information Using Spoken Natural Language Input with Multimodal Error Feedback

Background of the Invention

~~This is~~ are a Continuation In Part of co-pending U.S. Patent Application No. 09/225,198, filed January 5, 1999, Provisional U.S. Patent Application No. 60/124,718, filed March 17, 1999, Provisional U.S. Patent Application No. 60/124,720, filed March 17, 1999, and Provisional U.S. Patent Application No. 60/124,719, filed March 17, 1999, from which applications priority is claimed and these application are incorporated herein by reference.

The present invention relates generally to the navigation of electronic data by means of spoken natural language requests, and to feedback mechanisms and methods for resolving the errors and ambiguities that may be associated with such requests.

As global electronic connectivity continues to grow, and the universe of electronic data potentially available to users continues to expand, there is a growing need for information navigation technology that allows relatively naïve users to navigate and access desired data by means of natural language input. In many of the most important markets -- including the home entertainment arena, as well as mobile computing -- spoken natural language input is highly desirable, if not ideal. As just one example, the proliferation of high-bandwidth communications infrastructure for the home entertainment market (cable, satellite, broadband) enables delivery of movies-on-demand and other interactive multimedia content to the consumer's home television set. For users to take full advantage of this content stream ultimately requires interactive navigation of content databases in a manner that is too complex for user-friendly selection by means of a traditional remote-control clicker. Allowing spoken natural language requests as the input modality for rapidly searching and accessing desired content is an important objective for a successful consumer entertainment product in a context offering a dizzying range of database content choices. As further examples, this same need to drive navigation of (and transaction with) relatively complex data warehouses using spoken natural language requests applies equally to surfing the Internet/Web or other networks for general information, multimedia content, or e-commerce transactions.

In general, the existing navigational systems for browsing electronic databases and data warehouses (search engines, menus, etc.), have been designed without navigation via spoken natural language as a specific goal. So today's world is full of existing electronic data navigation systems that do not assume browsing via natural spoken commands, but rather assume text and mouse-click inputs (or in the case of TV remote controls, even less). Simply recognizing voice commands within an extremely limited vocabulary and grammar -- the spoken equivalent of button/click input (e.g., speaking "channel 5" selects TV channel 5) -- is really not sufficient by itself to satisfy the objectives described above. In order to deliver a true "win" for users, the voice-driven front-end must accept spoken natural language input in a manner that is intuitive to users. For example, the front-end should not require learning a highly specialized command language or format. More fundamentally, the front-end must allow users to speak directly in terms of what the user ultimately wants -- e.g., "I'd like to see a Western film directed by Clint Eastwood" -- as opposed to speaking in terms of arbitrary navigation structures (e.g., hierarchical layers of menus, commands, etc.) that are essentially artifacts reflecting constraints of the pre-existing text/click navigation system. At the same time, the front-end must recognize and accommodate the reality that a stream of naïve spoken natural language input will, over time, typically present a variety of errors and/or ambiguities: e.g., garbled/unrecognized words (did the user say "Eastwood" or "Easter"?) and under-constrained requests ("Show me the Clint Eastwood movie"). An approach is needed for handling and resolving such errors and ambiguities in a rapid, user-friendly, non-frustrating manner.

What is needed is a methodology and apparatus for rapidly constructing a voice-driven front-end atop an existing, non-voice data navigation system, whereby users can interact by means of intuitive natural language input not strictly conforming to the step-by-step browsing architecture of the existing navigation system, and wherein any errors or ambiguities in user input are rapidly and conveniently resolved. The solution to this need should be compatible with the constraints of a multi-user, distributed environment such as the Internet/Web or a proprietary high-bandwidth content delivery network; a solution contemplating one-at-a-time user interactions at a single location is insufficient, for example.

SUMMARY OF THE INVENTION

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The present invention addresses the above needs by providing a system, method, and article of manufacture for navigating network-based electronic data sources in response to spoken NL input requests. When a spoken natural language input request is received from a user, it is interpreted, such as by using a speech recognition engine to extract speech data from acoustic voice signals, and using a natural language parser to linguistically parse the speech data. The interpretation of the spoken natural language request can be performed on a computing device locally with the user or remotely from the user. The resulting interpretation of the request is thereupon used to automatically construct an operational navigation query to retrieve the desired information from one or more electronic network data sources, which is then transmitted to a client device of the user. If the network data source is a database, the navigation query is constructed in the format of a database query language.

Typically, errors or ambiguities emerge in the interpretation of the spoken NL request, such that the system cannot instantiate a complete, valid navigational template. This is to be expected occasionally, and one preferred aspect of the invention is the ability to handle such errors and ambiguities in relatively graceful and user-friendly manner. Instead of simply rejecting such input and defaulting to traditional input modes or simply asking the user to try again, a preferred embodiment of the present invention seeks to converge rapidly toward instantiation of a valid navigational template by soliciting additional clarification from the user as necessary, either before or after a navigation of the data source, via multimodal input, i.e., by means of menu selection or other input modalities including and in addition to spoken natural language. This clarifying, multi-modal dialogue takes advantage of whatever partial navigational information has been gleaned from the initial interpretation of the user's spoken NL request. This clarification process continues until the system converges toward an adequately instantiated navigational template, which is in turn used to navigate the network-based data and retrieve the user's desired information. The retrieved information is transmitted across the network and presented to the user on a suitable client display device.

In a further aspect of the present invention, the construction of the navigation query includes extracting an input template for an online scripted interface to the data source and using the input template to construct the navigation query. The extraction of the input template can include dynamically scraping the online scripted interface.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention, together with further advantages thereof, may best be understood by reference to the following description taken in conjunction with the accompanying drawings in which:

Figure 1a illustrates a system providing a spoken natural language interface for network-based information navigation, in accordance with an embodiment of the present invention with server-side processing of requests;

Figure 1b illustrates another system providing a spoken natural language interface for network-based information navigation, in accordance with an embodiment of the present invention with client-side processing of requests;

Figure 2 illustrates a system providing a spoken natural language interface for network-based information navigation, in accordance with an embodiment of the present invention for a mobile computing scenario;

Figure 3 illustrates the functional logic components of a request processing module in accordance with an embodiment of the present invention;

Figure 4 illustrates a process utilizing spoken natural language for navigating an electronic database in accordance with one embodiment of the present invention;

Figure 5 illustrates a process for constructing a navigational query for accessing an online data source via an interactive, scripted (e.g., CGI) form; and

Figure 6 illustrates an embodiment of the present invention utilizing a community of distributed, collaborating electronic agents.

DETAILED DESCRIPTION OF THE INVENTION

1. System Architecture

a. Server-End Processing of Spoken Input

Figure 1a is an illustration of a data navigation system driven by spoken natural language input, in accordance with one embodiment of the present invention. As shown, a user's voice input data is captured by a voice input device 102, such as a microphone. Preferably voice input device 102 includes a button or the like that can be pressed or held-down to activate a listening mode, so that the system need not continually pay attention to, or be confused by, irrelevant background noise. In one preferred embodiment well-suited for the home entertainment setting, voice input device 102 is a portable remote control device with an integrated microphone, and the voice data is transmitted from device 102 preferably via infrared (or other wireless) link to communications box 104 (e.g., a set-top box or a similar communications device that is capable of retransmitting the raw voice data and/or processing the voice data) local to the user's environment and coupled to communications network 106. The voice data is then transmitted across network 106 to a remote server or servers 108. The voice data may preferably be transmitted in compressed digitized form, or alternatively --particularly where bandwidth constraints are significant-- in analog format (e.g., via frequency modulated transmission), in the latter case being digitized upon arrival at remote server 108.

At remote server 108, the voice data is processed by request processing logic 300 in order to understand the user's request and construct an appropriate query or request for navigation of remote data source 110, in accordance with the interpretation process exemplified in Figure 4 and Figure 5 and discussed in greater detail below. For purposes of executing this process, request processing logic 300 comprises functional modules including speech recognition engine 310, natural language (NL) parser 320, query construction logic 330, and query refinement logic 340, as shown in Figure 3. Data source 110 may comprise database(s), Internet/web site(s), or other electronic information repositories, and preferably resides on a central server or servers -- which may or may not be the same as server 108, depending on the storage and bandwidth needs of the application and the resources available to the practitioner. Data source 110 may include multimedia content, such as movies or other digital video and audio content, other various forms of entertainment data, or other electronic information. The contents of data source 110 are navigated -- i.e., the contents are accessed and searched, for retrieval of the particular information desired by the user -- using the processes of Figures 4 and 5 as described in greater detail below.

Once the desired information has been retrieved from data source 110, it is electronically transmitted via network 106 to the user for viewing on client display device 112. In a preferred embodiment well-suited for the home entertainment setting, display device 112 is a television monitor or similar audiovisual entertainment device, typically in stationary position for comfortable viewing by users. In addition, in such preferred embodiment, display device 112 is coupled to or integrated with a communications box (which is preferably the same as communications box 104, but may also be a separate unit) for receiving and decoding/formatting the desired electronic information that is received across communications network 106.

Network 106 is a two-way electronic communications network and may be embodied in electronic communication infrastructure including coaxial (cable television) lines, DSL, fiber-optic cable, traditional copper wire (twisted pair), or any other type of hardwired connection. Network 106 may also include a wireless connection such as a satellite-based connection, cellular connection, or other type of wireless connection. Network 106 may be part of the Internet and may support TCP/IP communications, or may be embodied in a proprietary network, or in any other electronic communications network infrastructure, whether packet-switched or connection-oriented. A design consideration is that network 106 preferably provide suitable bandwidth depending upon the nature of the content anticipated for the desired application.

b. Client-End Processing of Spoken Input

Figure 1b is an illustration of a data navigation system driven by spoken natural language input, in accordance with a second embodiment of the present invention. Again, a user's voice input data is captured by a voice input device 102, such as a microphone. In the embodiment shown in Figure 1b, the voice data is transmitted from device 202 to requests processing logic 300, hosted on a local speech processor, for processing and interpretation. In the preferred embodiment illustrated in Figure 1b, the local speech processor is conveniently integrated as part of communications box 104, although implementation in a physically separate (but communicatively coupled) unit is also possible as will be readily apparent to those of skill in the art. The voice data is processed by the components of request processing logic 300 in order to understand the user's request and construct an appropriate query or request for navigation of remote data source 110, in accordance with the interpretation process exemplified in Figures 4 and 5 as discussed in greater detail below.

The resulting navigational query is then transmitted electronically across network 106 to data source 110, which preferably resides on a central server or servers 108. As in Figure 1a, data source 110 may comprise database(s), Internet/web site(s), or other electronic information repositories, and preferably may include multimedia content, such as movies or other digital video and audio content, other various forms of entertainment data, or other electronic information. The contents of data source 110 are then navigated -- i.e., the contents are accessed and searched, for retrieval of the particular information desired by the user -- preferably using the process of Figures 4 and 5 as described in greater detail below. Once the desired information has been retrieved from data source 110, it is electronically transmitted via network 106 to the user for viewing on client display device 112.

In one embodiment in accordance with Figure 1b and well-suited for the home entertainment setting, voice input device 102 is a portable remote control device with an integrated microphone, and the voice data is transmitted from device 102 preferably via infrared (or other wireless) link to the local speech processor. The local speech processor is coupled to communications network 106, and also preferably to client display device 112 (especially for purposes of query refinement transmissions, as discussed below in connection with Figure 4, step 412), and preferably may be integrated within or coupled to communications box 104. In addition, especially for purposes of a home entertainment application, display device 112 is preferably a television monitor or similar audiovisual entertainment device, typically in stationary position for comfortable viewing by users. In addition, in such preferred embodiment, display device 112 is coupled to a communications box (which is preferably the same as communications box 104, but may also be a physically separate unit) for receiving and decoding/formatting the desired electronic information that is received across communications network 106.

Design considerations favoring server-side processing and interpretation of spoken input requests, as exemplified in Figure 1a, include minimizing the need to distribute costly computational hardware and software to all client users in order to perform speech and language processing. Design considerations favoring client-side processing, as exemplified in Figure 1b, include minimizing the quantity of data sent upstream across the network from each client, as the speech recognition is performed before transmission across the network and only the query data and/or request needs to be sent, thus reducing the upstream bandwidth requirements.

c. Mobile Client Embodiment

A mobile computing embodiment of the present invention may be implemented by practitioners as a variation on the embodiments of either Figure 1a or Figure 1b. For example, as depicted in Figure 2, a mobile variation in accordance with the server-side processing architecture illustrated in Figure 1a may be implemented by replacing voice input device 102, communications box 104, and client display device 112, with an integrated, mobile, information appliance 202 such as a cellular telephone or wireless personal digital assistant (wireless PDA). Mobile information appliance 202 essentially performs the functions of the replaced components. Thus, mobile information appliance 202 receives spoken natural language input requests from the user in the form of voice data, and transmits that data (preferably via wireless data receiving station 204) across communications network 206 for server-side interpretation of the request, in similar fashion as described above in connection with Figure 1. Navigation of data source 210 and retrieval of desired information likewise proceeds in an analogous manner as described above. Display information transmitted electronically back to the user across network 206 is displayed for the user on the display of information appliance 202, and audio information is output through the appliance's speakers.

Practitioners will further appreciate, in light of the above teachings, that if mobile information appliance 202 is equipped with sufficient computational processing power, then a mobile variation of the client-side architecture exemplified in Figure 2 may similarly be implemented. In that case, the modules corresponding to request processing logic 300 would be embodied locally in the computational resources of mobile information appliance 202, and the logical flow of data would otherwise follow in a manner analogous to that previously described in connection with Figure 1b.

As illustrated in Figure 2, multiple users, each having their own client input device, may issue requests, simultaneously or otherwise, for navigation of data source 210. This is equally true (though not explicitly drawn) for the embodiments depicted in Figures 1a and 1b. Data source 210 (or 100), being a network accessible information resource, has typically already been constructed to support access requests from simultaneous multiple network users, as known by practitioners of ordinary skill in the art. In the case of server-side speech processing, as exemplified in Figures 1a and 2, the interpretation logic and error correction logic modules are also preferably designed and implemented to support queuing and multi-tasking of requests from multiple simultaneous network users, as will be appreciated by those of skill in the art.

It will be apparent to those skilled in the art that additional implementations, permutations and combinations of the embodiments set forth in Figures 1a, 1b, and 2 may be created without straying from the scope and spirit of the present invention. For example, practitioners will understand, in light of the above teachings and design considerations, that it is possible to divide and allocate the functional components of request processing logic 300 between client and server. For example, speech recognition -- in entirety, or perhaps just early stages such as feature extraction -- might be performed locally on the client end, perhaps to reduce bandwidth requirements, while natural language parsing and other necessary processing might be performed upstream on the server end, so that more extensive computational power need not be distributed locally to each client. In that case, corresponding portions of request processing logic 300, such as speech recognition engine 310 or portions thereof, would reside locally at the client as in Figure 1b, while other component modules would be hosted at the server end as in Figures 1a and 2.

Further, practitioners may choose to implement the each of the various embodiments described above on any number of different hardware and software computing platforms and environments and various combinations thereof, including, by way of just a few examples: a general-purpose hardware microprocessor such as the Intel Pentium series; operating system software such as Microsoft Windows/CE, Palm OS, or Apple Mac OS (particularly for client devices and client-side processing), or Unix, Linux, or Windows/NT (the latter three particularly for network data servers and server-side processing), and/or proprietary information access platforms such as Microsoft's WebTV or the Diva Systems video-on-demand system.

2. Processing Methodology

The present invention provides a spoken natural language interface for interrogation of remote electronic databases and retrieval of desired information. A preferred embodiment of the present invention utilizes the basic methodology outlined in the flow diagram of Figure 4 in order to provide this interface. This methodology will now be discussed.

a. Interpreting Spoken Natural Language Requests

At step 402, the user's spoken request for information is initially received in the form of raw (acoustic) voice data by a suitable input device, as previously discussed in connection with Figures 1-2. At step 404 the voice data received from the user is interpreted in order to understand the user's request for information. Preferably this step includes performing speech recognition in order to extract words from the voice data, and further includes natural language parsing of those words in order to generate a structured linguistic representation of the user's request.

Speech recognition in step 404 is performed using speech recognition engine 310. A variety of commercial quality, speech recognition engines are readily available on the market, as practitioners will know. For example, Nuance Communications offers a suite of speech recognition engines, including Nuance 6, its current flagship product, and Nuance Express, a lower cost package for entry-level applications. As one other example, IBM offers the ViaVoice speech recognition engine, including a low-cost shrink-wrapped version available through popular consumer distribution channels. Basically, a speech recognition engine processes acoustic voice data and attempts to generate a text stream of recognized words.

Typically, the speech recognition engine is provided with a vocabulary lexicon of likely words or phrases that the recognition engine can match against its analysis of acoustical signals, for purposes of a given application. Preferably, the lexicon is dynamically adjusted to reflect the current user context, as established by the preceding user inputs. For example, if a user is engaged in a dialogue with the system about movie selection, the recognition engine's vocabulary may preferably be adjusted to favor relevant words and phrases, such as a stored list of proper names for popular movie actors and directors, etc. Whereas if the current dialogue involves selection and viewing of a sports event, the engine's vocabulary might preferably be adjusted to favor a stored list of proper names for professional sports teams, etc. In addition, a speech recognition engine is provided with language models that help the engine predict the most likely interpretation of a given segment of acoustical voice data, in the current context of phonemes or words in which the segment appears. In addition, speech recognition engines often echo to the user, in more or less real-time, a transcription of the engine's best guess at what the user has said, giving the user an opportunity to confirm or reject.

In a further aspect of step 404, natural language interpreter (or parser) 320 linguistically parses and interprets the textual output of the speech recognition engine. In a preferred embodiment of the present invention, the natural-language interpreter attempts to determine both the meaning of spoken words (semantic processing) as well as the grammar of the statement (syntactic processing), such as the Gemini Natural Language Understanding System developed by SRI International. The Gemini system is described in detail in publications entitled "Gemini: A Natural Language System for Spoken-Language Understanding" and "Interleaving Syntax and Semantics in an Efficient Bottom-Up Parser," both of which are currently available online at http://www.ai.sri.com/natural-language/projects/arpa-sls/nat-lang.html. (Copies of those publications are also included in an information disclosure statement submitted herewith, and are incorporated herein by this reference). Briefly, Gemini applies a set of syntactic and semantic grammar rules to a word string using a bottom-up parser to generate a logical form, which is a structured representation of the context-independent meaning of the string. Gemini can be used with a variety of grammars, including general English grammar as well as application-specific grammars. The Gemini parser is based on "unification grammar," meaning that grammatical categories incorporate features that can be assigned values; so that when grammatical category expressions are matched in the course of parsing or semantic interpretation, the information contained in the features is combined, and if the feature values are incompatible the match fails.

It is possible for some applications to achieve a significant reduction in speech recognition error by using the natural-language processing system to re-score recognition hypotheses. For example, the grammars defined for a language parser like Gemini may be compiled into context-free grammar that, in turn, can be used directly as language models for speech recognition engines like the Nuance recognizer. Further details on this methodology are provided in the publication "Combining Linguistic and Statistical Knowledge Sources in Natural-Language Processing for ATIS" which is currently available online through http://www.ai.sri.com/natural-language/projects/arpa-sls/spnl-int.html. A copy of this publication is included in an information disclosure submitted herewith, and is incorporated herein by this reference.

In an embodiment of the present invention that may be preferable for some applications, the natural language interpreter "learns" from the past usage patterns of a particular user or of groups of users. In such an embodiment, the successfully interpreted requests of users are stored, and can then be used to enhance accuracy by comparing a current request to the stored requests, thereby allowing selection of a most probable result.

b. Constructing Navigation Queries

In step 405 request processing logic 300 identifies and selects an appropriate online data source where the desired information (in this case, current weather reports for a given city) can be found. Such selection may involve look-up in a locally stored table, or possibly dynamic searching through an online search engine, or other online search techniques. For some applications, an embodiment of the present invention may be implemented in which only access to a particular data source (such as a particular vendor's proprietary content database) is supported; in that case, step 405 may be trivial or may be eliminated entirely.

Step 406 attempts to construct a navigation query, reflecting the interpretation of step 404. This operation is preferably performed by query construction logic 330.

A "navigation query" means an electronic query, form, series of menu selections, or the like; being structured appropriately so as to navigate a particular data source of interest in search of desired information. In other words, a navigation query is constructed such that it includes whatever content and structure is required in order to access desired information electronically from a particular database or data source of interest.

For example, for many existing electronic databases, a navigation query can be embodied using a formal database query language such as Standard Query Language (SQL). For many databases, a navigation query can be constructed through a more user-friendly interactive front-end, such as a series of menus and/or interactive forms to be selected or filled in. SQL is a standard interactive and programming language for getting information from and updating a database. SQL is both an ANSI and an ISO standard. As is well known to practitioners, a Relational Database Management System (RDBMS), such as Microsoft's Access, Oracle's Oracle7, and Computer Associates' CA-OpenIngres, allow programmers to create, update, and administer a relational database. Practitioners of ordinary skill in the art will be thoroughly familiar with the notion of database navigation through structured query, and will be readily able to appreciate and utilize the existing data structures and navigational mechanisms for a given database, or to create such structures and mechanisms where desired.

In accordance with the present invention, the query constructed in step 406 must reflect the user's request as interpreted by the speech recognition engine and the NL parser in step 404. In embodiments of the present invention wherein data source 110 (or 210 in the corresponding embodiment of Figure 2) is a structured relational database or the like, step 406 of the present invention may entail constructing an appropriate Structured Query Language (SQL) query or the like, or automatically filling out a front-end query form, series of menus or the like, as described above.

In many existing Internet (and Intranet) applications, an online electronic data source is accessible to users only through the medium of interaction with a so-called Common Gateway Interface (CGI) script. Typically the user who visits a web site of this nature must fill in the fields of an online interactive form. The online form is in turn linked to a CGI script, which transparently handles actual navigation of the associated data source and produces output for viewing by the user's web browser. In other words, direct user access to the data source is not supported, only mediated access through the form and CGI script is offered.

For applications of this nature, an advantageous embodiment of the present invention "scrapes" the scripted online site where information desired by a user may be found in order to facilitate construction of an effective navigation query. For example, suppose that a user's spoken natural language request is: "What's the weather in Miami?" After this request is received at step 402 and interpreted at step 404, assume that step 405 determines that the desired weather information is available online through the medium of a CGI-scripted interactive form. Step 406 is then preferably carried out using the expanded process diagrammed in Figure 5. In particular, at sub-step 520, query construction logic 330 electronically "scrapes" the online interactive form, meaning that query construction logic 330 automatically extracts the format and structure of input fields accepted by the online form. At sub-step 522, a navigation query is then constructed by instantiating (filling in) the extracted input format -- essentially an electronic template -- in a manner reflecting the user's request for information as interpreted in step 404. The flow of control then returns to step 407 of Figure 4. Ultimately, when the query thus constructed by scraping is used to navigate the online data source in step 408, the query effectively initiates the same scripted response as if a human user had visited the online site and had typed appropriate entries into the input fields of the online form.

In the embodiment just described, scraping step 520 is preferably carried out with the assistance of an online extraction utility such as WebL. WebL is a scripting language for automating tasks on the World Wide Web. It is an imperative, interpreted language that has built-in support for common web protocols like HTTP and FTP, and popular data types like HTML and XML. WebL's implementation language is Java, and the complete source code is available from Compaq. In addition, step 520 is preferably performed dynamically when necessary -- in other words, on-the-fly in response to a particular user query -- but in some applications it may be possible to scrape relatively stable (unchanging) web sites of likely interest in advance and to cache the resulting template information.

It will be apparent, in light of the above teachings, that preferred embodiments of the present invention can provide a spoken natural language interface atop an existing, non-voice data navigation system, whereby users can interact by means of intuitive natural language input not strictly conforming to the linear browsing architecture or other artifacts of an existing menu/text/click navigation system. For example, users of an appropriate embodiment of the present invention for a video-on-demand application can directly speak the natural request: "Show me the movie 'Unforgiven'" -- instead of walking step-by-step through a typically linear sequence of genre/title/actor/director menus, scrolling and selecting from potentially long lists on each menu, or instead of being forced to use an alphanumeric keyboard that cannot be as comfortable to hold or use as a lightweight remote control. Similarly, users of an appropriate embodiment of the present invention for a web-surfing application in accordance with the process shown in Figure 5 can directly speak the natural request: "Show me a one-month price chart for Microsoft stock" -- instead of potentially having to navigate to an appropriate web site, search for the right ticker symbol, enter/select the symbol, and specify display of the desired one-month price chart, each of those steps potentially involving manual navigation and data entry to one or more different interaction screens. (Note that these examples are offered to illustrate some of the potential benefits offered by appropriate embodiments of the present invention, and not to limit the scope of the invention in any respect.)

c. Error Correction

Several problems can arise when attempting to perform searches based on spoken natural language input. As indicated at decision step 407 in the process of Figure 4, certain deficiencies may be identified during the process of query construction, before search of the data source is even attempted. For example, the user's request may fail to specify enough information in order to construct a navigation query that is specific enough to obtain a satisfactory search result. For example, a user might orally request "what's the weather?" whereas the national online data source identified in step 405 and scraped in step 520 might require specifying a particular city.

Additionally, certain deficiencies and problems may arise following the navigational search of the data source at step 408, as indicated at decision step 409 in Figure 4. For example, with reference to a video-on-demand application, a user may wish to see the movie "Unforgiven", but perhaps the user can't recall name of the film, but knows it was directed by and starred actor Clint Eastwood. A typical video-on-demand database might indeed be expected to allow queries specifying the name of a leading actor and/or director, but in the case of this query -- as in many cases -- that will not be enough to narrow the search to a single film, and additional user input in some form is required.

In the event that one or more deficiencies in the user's spoken request, as processed, result in the problems described, either at step 407 or 409, some form of error handling is in order. A straightforward, crude technique might be for the system to respond simply *"input not understood / insufficient; please try again."* However, that approach will likely result in frustrated users, and is not optimal or even acceptable for most applications. Instead, a preferred technique in accordance with the present invention handles such errors and deficiencies in user input at step 412, whether detected at step 407 or step 409, by soliciting additional input from the user in a manner taking advantage of the partial construction already performed and via user interface modalities in addition to spoken natural language ("multi-modality"). This supplemental interaction is preferably conducted through client display device 112 (202, in the embodiment of Figure 2), and may include textual, graphical, audio and/or video media. Further details and examples are provided below. Query refinement logic 340 preferably carries out step 412. The additional input received from the user is fed into and augments interpreting step 404, and query construction step 406 is likewise repeated with the benefit of the augmented interpretation. These operations, and subsequent navigation step 408, are preferably repeated until no remaining problems or deficiencies are identified at decision points 407 or 409. Further details and examples for this query refinement process are provided immediately below.

Consider again the example in which the user of a video-on-demand application wishes to see "Unforgiven" but can only recall that it was directed by and starred Clint Eastwood. First, it bears noting that using a prior art navigational interface, such as a conventional menu interface, will likely be relatively tedious in this case. The user can proceed through a sequence of menus, such as Genre (select "western"), Title (skip), Actor ("Clint Eastwood"), and Director ("Clint Eastwood"). In each case --especially for the last two items -- the user would typically scroll and select from fairly long lists in order to enter his or her desired name, or perhaps use a relatively couch-unfriendly keypad to manually type the actor's name twice.

Using a preferred embodiment of the present invention, the user instead speaks aloud, holding remote control microphone 102, "I want to see that movie starring and directed by Clint Eastwood. Can't remember the title." At step 402 the voice data is received. At step 404 the voice data is interpreted. At step 405 an appropriate online data source is selected (or perhaps the system is directly connected to a proprietary video-on-demand provider). At step 406 a query is automatically constructed by the query construction logic 330 specifying "Clint Eastwood" in both the actor and director fields. Step 407 detects no obvious problems, and so the query is electronically submitted and the data source is navigated at step 408, yielding a list of several records satisfying the query (e.g., "Unforgiven", "True Crime", "Absolute Power", etc.). Step 409 detects that additional user input is needed to further refine the query in order to select a particular film for viewing.

At that point, in step 412 query refinement logic 340 might preferably generate a display for client display device 112 showing the (relatively short) list of film titles that satisfy the user's stated constraints. The user can then preferably use a relatively convenient input modality, such as buttons on the remote control, to select the desired title from the menu. In a further preferred embodiment, the first title on the list is highlighted by default, so that the user can simply press an "OK" button to choose that selection. In a further preferred feature, the user can mix input modalities by speaking a response like "I want number one on the list." Alternatively, the user can preferably say, "Let's see Unforgiven," having now been reminded of the title by the menu display.

Utilizing the user's supplemental input, request processing logic 300 iterates again through steps 404 and 406, this time constructing a fully-specified query that specifically requests the Eastwood film "Unforgiven." Step 408 navigates the data source using that query and retrieves the desired film, which is then electronically transmitted in step 410 from network server 108 to client display device 112 via communications network 106.

Now consider again the example in which the user of a web surfing application wants to know his or her local weather, and simply asks, "what's the weather?" At step 402 the voice data is received. At step 404 the voice data is interpreted. At step 405 an online web site providing current weather information for major cities around the world is selected. At step 406 and sub-step 520, the online site is scraped using a WebL-style tool to extract an input template for interacting with the site. At sub-step 522, query construction logic 330 attempts to construct a navigation query by instantiating the input template, but determines (quite rightly) that a required field -- name of city -- cannot be determined from the user's spoken request as interpreted in step 404. Step 407 detects this deficiency, and in step 412 query refinement logic 340 preferably generates output for client display device 112 soliciting the necessary supplemental input. In a preferred embodiment, the output might display the name of the city where the user is located highlighted by default. The user can then simply press an "OK" button -- or perhaps mix modalities by saying "yes, exactly" -- to choose that selection. A preferred embodiment would further display an alphabetical scrollable menu listing other major cities, and/or invite the user to speak or select the name of the desired city.

Here again, utilizing the user's supplemental input, request processing logic 300 iterates through steps 404 and 406. This time, in performing sub-step 520, a cached version of the input template already scraped in the previous iteration might preferably be retrieved. In sub-step 522, query construction logic 330 succeeds this time in instantiating the input template and constructing an effective query, since the

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desired city has now been clarified. Step 408 navigates the data source using that query and retrieves the desired weather information, which is then electronically transmitted in step 410 from network server 108 to client display device 112 via communications network 106.

It is worth noting that in some instances, there may be details that are not explicitly provided by the user, but that query construction logic 330 or query refinement logic 340 may preferably deduce on their own through reasonable assumptions, rather than requiring the use to provide explicit clarification. For example, in the example previously described regarding a request for a weather report, in some applications it might be preferable for the system to simply assume that the user means a weather report for his or her home area and to retrieve that information, if the cost of doing so is not significantly greater than the cost of asking the user to clarify the query. Making such an assumption might be even more strongly justified in a preferred embodiment, as described earlier, where user histories are tracked, and where such history indicates that a particular user or group of users typically expect local information when asking for a weather forecast. At any rate, in the event such an assumption is made, if the user actually intended to request the weather for a different city, the user would then need to ask his or her question again. It will be apparent to practitioners, in light of the above teachings, that the choice of whether to program query construction logic 330 and query refinement logic 340 to make make particular assumptions will typically involve trade-offs involving user conveience that can be assessed in the context of specific applications.

3. Open Agent Architecture (OAA®)

Open Agent Architecture™ (OAA®) is a software platform, developed by the assignee of the present invention, that enables effective, dynamic collaboration among communities of distributed electronic agents. OAA is described in greater detail in co-pending U.S. Patent Application No. 09/225,198, which has been incorporated herein by reference. Very briefly, the functionality of each client agent is made available to the agent community through registration of the client agent's capabilities with a facilitator. A software "wrapper" essentially surrounds the underlying application program performing the services offered by each client. The common infrastructure for constructing agents is preferably supplied by an *agent library.* The agent library is preferably accessible in the runtime environment of several different programming languages. The agent library preferably minimizes the effort required to construct a new system and maximizes the ease with which legacy systems can be "wrapped" and made compatible with the agent-based architecture of the present invention. When invoked, a client agent makes a connection to a facilitator, which is known as its *parent facilitator*. Upon connection, an agent registers with its parent facilitator a specification of the capabilities and services it can provide, using a high-level, declarative Interagent Communication Language (*"ICL"*) to express those capabilities. Tasks are presented to the facilitator in the form of ICL goal expressions. When a facilitator determines that the registered capabilities of one of its client agents will help satisfy a current goal or sub-goal thereof, the facilitator delegates that sub-goal to the client agent in the form of an ICL request. The client agent processes the request and returns answers or information to the facilitator. In processing a request, the client agent can use *ICL* to request services of other agents, or utilize other infrastructure services for collaborative work. The facilitator coordinates and integrates the results received from different client agents on various sub-goals, in order to satisfy the overall goal.

OAA provides a useful software platform for building systems that integrate spoken natural language as well as other user input modalities. For example, see the above-referenced co-pending patent application, especially Figure 13 and the corresponding discussion of a "multi-modal maps" application, and Figure 12 and the corresponding discussion of a "unified messaging" application. Another example is the InfoWiz interactive information kiosk developed by the assignee and described in the document entitled "InfoWiz: An Animated Voice Interactive Information System" available online at http://www.ai.sri.com/~oaa/applications.html. A copy of the InfoWhiz document is provided in an Information Disclosure Statement submitted herewith and incorporated herein by this reference. A further example is the "CommandTalk" application developed by the assignee for the U.S. military, as described online at http://www.ai.sri.com/~lesaf/commandtalk.html and in the following publications, copies of which are provided in an Information Disclosure Statement submitted herewith and incorporated herein by this reference:

- "CommandTalk: A Spoken-Language Interface for Battlefield Simulations", 1997, by Robert Moore, John Dowding, Harry Bratt, J. Mark Gawron, Yonael Gorfu and Adam Cheyer, in "Proceedings of the Fifth Conference on Applied Natural Language Processing", Washington, DC, pp. 1-7, Association for Computational Linguistics

- "The CommandTalk Spoken Dialogue System", 1999, by Amanda Stent, John Dowding, Jean Mark Gawron, Elizabeth Owen Bratt and Robert Moore, in "Proceedings of the Thirty-Seventh Annual Meeting of the ACL", pp. 183-190, University of Maryland, College Park, MD, Association for Computational Linguistics

- "Interpreting Language in Context in CommandTalk", 1999, by John Dowding and Elizabeth Owen Bratt and Sharon Goldwater, in "Communicative Agents: The Use of Natural Language in Embodied Systems", pp. 63-67, Association for Computing Machinery (ACM) Special Interest Group on Artificial Intelligence (SIGART), Seattle, WA

For some applications and systems, OAA can provide an advantageous platform for constructing embodiments of the present invention. For example, a representative application is now briefly presented, with reference to Figure 6. If the statement "show me movies starring John Wayne" is spoken into the voice input device, the voice data for this request will be sent by UI agent 650 to facilitator 600, which in turn will ask natural language (NL) agent 620 and speech recognition agent 610 to interpret the query and return the interpretation in *ICL* format. The resulting *ICL* goal expression is then routed by the facilitator to appropriate agents -- in this case, video-on-demand database agent 640 -- to execute the request. Video database agent 640 preferably includes or is coupled to an appropriate embodiment of query construction logic 330 and query refinement logic 340, and may also issue ICL requests to facilitator 600 for additional assistance -- e.g., display of menus and capture of additional user input in the event that query refinement is needed -- and facilitator 600 will delegate such requests to appropriate client agents in the community. When the desired video content is ultimately retrieved by video database agent 640, UI agent 650 is invoked by facilitator 600 to display the movie.

Other spoken user requests, such as a request for the current weather in New York City or for a stock quote, would eventually lead facilitator to invoke web database agent 630 to access the desired information from an appropriate Internet site. Here again, web database agent 630 preferably includes or is coupled to an appropriate embodiment of query construction logic 330 and query refinement logic 340, including a scraping utility such as WebL. Other spoken requests, such as a request to view recent emails or access voice mail, would lead the facilitator to invoke the appropriate email agent 660 and/or telephone agent 680. A request to record a televised program of interest might lead facilitator 600 to invoke web database agent 630 to return televised program schedule information, and then invoke VCR controller agent 680 to program the associated VCR unit to record the desired television program at the scheduled time.

Control and connectivity embracing additional electronic home appliances (e.g., microwave oven, home surveillance system, etc.) can be integrated in comparable fashion. Indeed, an advantage of OAA-based embodiments of the present invention, that will be apparent to practitioners in light of the above teachings and in light of the teachings disclosed in the cited co-pending patent applications, is the relative ease and flexibility with which additional service agents can be plugged into the existing platform, immediately enabling the facilitator to respond dynamically to spoken natural language requests for the corresponding services.

4. Further Embodiments and Equivalents

While the present invention has been described in terms of several preferred embodiments, there are many alterations, permutations, and equivalents that may fall within the scope of this invention. It should also be noted that there are many alternative ways of implementing the methods and apparatuses of the present invention. It is therefore intended that the following appended claims be interpreted as including all such alterations, permutations, and equivalents as fall within the true spirit and scope of the present invention.

CLAIMS

What is claimed is:

1. A method for utilizing spoken natural language for navigating an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising the steps of:

(a) receiving a spoken natural language ("NL") request for desired information from the user;

(b) rendering an interpretation of the spoken natural language request;

(c) constructing at least part of a navigation query based upon the interpretation;

(d) soliciting additional input from the user, including user interaction in a modality different than the original request;

(e) refining the navigation query, based upon the additional input;

(f) using the refined navigation query to select a portion of the electronic data source; and

(g) transmitting the selected portion of the electronic data source from the network server to a client device of the user.

2. The method of claim 1, wherein the step of rendering an interpretation further includes deriving linguistic information by using a speech recognition engine and an NL parser.

3. The method of claim 1, wherein the step of constructing a navigation query further includes the steps of extracting an input template for an online scripted interface to the data source, and using the input template to construct the navigation query.

4. The method of claim 3, wherein the step of extracting an input template includes dynamically scraping the online scripted interface.

5. The method of claim 1, wherein the navigation query is constructed in the format of a database query language.

6. The method of claim 1, wherein the step of rendering an interpretation and the step of constructing a navigation query are performed, at least in part, on a computing device located locally with the user.

7. The method of claim 1, wherein the step of rendering an interpretation and the step of constructing a navigation query are performed, at least in part, on a network computing device located remotely from the user.

8. The method of claim 1, wherein the step of soliciting additional input is performed in response to one or more deficiencies encountered during the step of constructing a navigation query.

9. The method of claim 8, wherein the deficiencies include unresolved words of the spoken NL request.

10. The method of claim 8, wherein the deficiencies include one or more required elements of the navigational query ~~not~~ determinable from the interpretation of the spoken NL request.

11. The method of claim 1, wherein the step of soliciting additional input is performed in response to one or more deficiencies encountered after a first navigation of the data source using the navigation query constructed in step (c).

12. The method of claim 11, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

13. The method of claim 11, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

14. The method of claim 1, wherein the input modality of step (d) includes selecting from a displayed option menu.

15. The method of claim 14, wherein the act of selecting from the displayed option menu is performed by speaking.

16. The method of claim 1, wherein the method is performed with respect to a plurality of simultaneous users and corresponding client devices.

17. The method of claim 1, further including the step of selecting the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken NL request.

18. The method of claim 1, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

19. A system for utilizing spoken natural language to navigate an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, the system comprising:

(a) a portable microphone operable to receive a spoken natural language ("NL") request for desired information from the user;

(b) spoken language processing logic, operable to render an interpretation of the spoken natural language request;

(c) query construction logic, operable to construct a navigation query in response to the interpretation of the spoken natural language request;

(d) user interaction logic, operable to solicit additional input from the user, including user interaction in a modality different than the original request;

(e) query refining logic, operable to refine the navigation query, based upon the additional input;

(f) navigation logic, operable to select a portion of the electronic data source using the navigation query; and

(g) electronic communications infrastructure for transmitting the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user.

20. The system of claim 19, wherein the spoken language processing logic includes speech recognition logic and an NL parsing logic for deriving linguistic information.

21. The system of claim 19, wherein the spoken language processing logic extracts an input template for an online scripted interface to the data source, and uses the input template to construct the navigation query.

22. The system of claim 21, wherein the spoken language processing logic dynamically scrapes the online scripted interface.

23. The system of claim 19, wherein the query construction logic constructs the query in the format of a database query language.

24. The system of claim 19, wherein at least a portion of the spoken language processing logic is hosted on a computing device located locally with the user, and wherein the portable microphone is electronically coupled to the local computing device.

25. The system of claim 19, wherein at least a portion of the spoken language processing logic is hosted on a network computing device located remotely from the user, and wherein the portable microphone sends data to the remote network computing device via the communications infrastructure.

26. The system of claim 19, wherein the user interaction logic solicits additional input in response to one or more deficiencies encountered during construction of the navigation query.

27. The system of claim 26, wherein the deficiencies include unresolved words of the spoken NL request.

28. The system of claim 26, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken NL request.

29. The system of claim 19, wherein the user interaction logic solicits additional input in response to one or more deficiencies encountered after a first navigation of the data source performed by the navigation logic.

30. The system of claim 29, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

31. The system of claim 29, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

32. The system of claim 19, wherein the user interaction logic displays an option menu.

33. The system of claim 32, wherein the act of selecting from the displayed option menu is performed by speaking.

34. The system of claim 19, wherein the navigation logic selects the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken NL request.

35. The system of claim 19, wherein the electronic data source stores multimedia content including at least ~~one of~~ video content and audio content.

36. The system of claim 19, wherein the display device receives data from the electronicdata source on the network servers via a communications box.

37. The system of claim 19, wherein the electronic communication infrastructure is a two-way infrastructure and is selected from among one or more of the following group: {coaxial cable, DSL, satellite, wireless/cellular, fiber-optic}.

38. An computer program embodied on a computer readable medium for utilizing spoken natural language for navigating an electronic data source, the

electronic data source being located at one or more network servers located remotely from a user, comprising:

(a) a code segment that receives a spoken natural language ("NL") request for desired information from the user;

(b) a code segment that renders an interpretation of the spoken natural language request;

(c) a code segment that constructs at least part of a navigation query based upon the interpretation;

(d) a code segment that solicits additional input from the user, including user interaction in a modality different than the original request;

(e) a code segment that refines the navigation query, based upon the additional input;

(f) a code segment that uses the refined navigation query to select a portion of the electronic data source; and

(g) a code segment that transmits the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user.

39. The computer program of claim 38, further comprising a code segment that derives linguistic information by using a speech recognition engine and an NL parser.

40. The computer program of claim 38, further comprising a code segment that extract an input template for an online scripted interface to the data source, and a code segment that uses the input template to construct the navigation query.

41. The computer program of claim 40, further comprising a code segment that dynamically scrapes the online scripted interface.

42. The computer program of claim 38, wherein the navigation query is constructed in the format of a database query language.

43. The computer program of claim 38, wherein rendering of the interpretation and the construction of the navigation query are performed, at least in part, on a computing device located locally with the user.

44. The computer program of claim 38, wherein the rendering of the interpretation and the construction of a navigation query are performed, at least in part, on a network computing device located remotely from the user.

45. The computer program of claim 38, wherein code segment that solicits additional input solicits the additional input in response to one or more deficiencies encountered during the constructing of the navigation query.

46. The computer program of claim 45, wherein the deficiencies include unresolved words of the spoken NL request.

47. The computer program of claim 45, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken NL request.

48. The computer program of claim 38, wherein the code segment that solicits the additional input solicits the additional input in response to one or more deficiencies encountered after a first navigation of the data source.

49. The computer program of claim 48, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

50. The computer program of claim 48, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

51. The computer program of claim 38, wherein code segment that solicits additional input displays an option menu.

52. The computer program of claim 51, wherein the act of selecting from the displayed option menu is performed by speaking.

53. The computer program of claim 38, wherein the code segments of the computer program operate with respect to a plurality of simultaneous users and corresponding client devices.

54. The computer program of claim 38, further comprising a code segment that selects the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken NL request.

55. The computer program of claim 38, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

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NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK

ABSTRACT OF THE INVENTION

A system, method, and article of manufacture are provided for navigating an electronic data source by means of spoken natural language. When a spoken natural language input request is received from a user, it is interpreted. Additional input is solicited from the user in a modality different than the original request and used to refine the navigation query. The resulting interpretation of the request is thereupon used to automatically construct an operational navigation query to retrieve the desired information from one or more electronic network data sources.

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Phone # 408-971-4660	Phone # 650-859-6631
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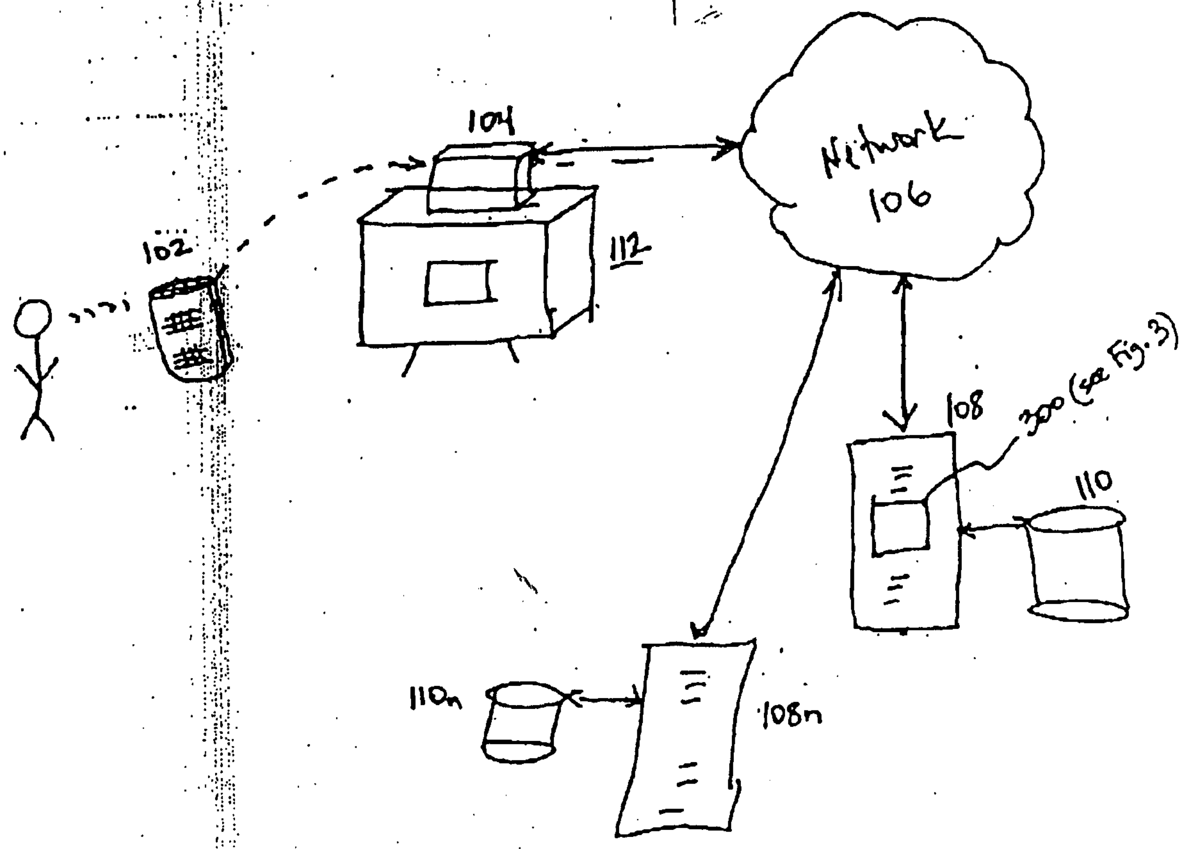

Fig. 1a

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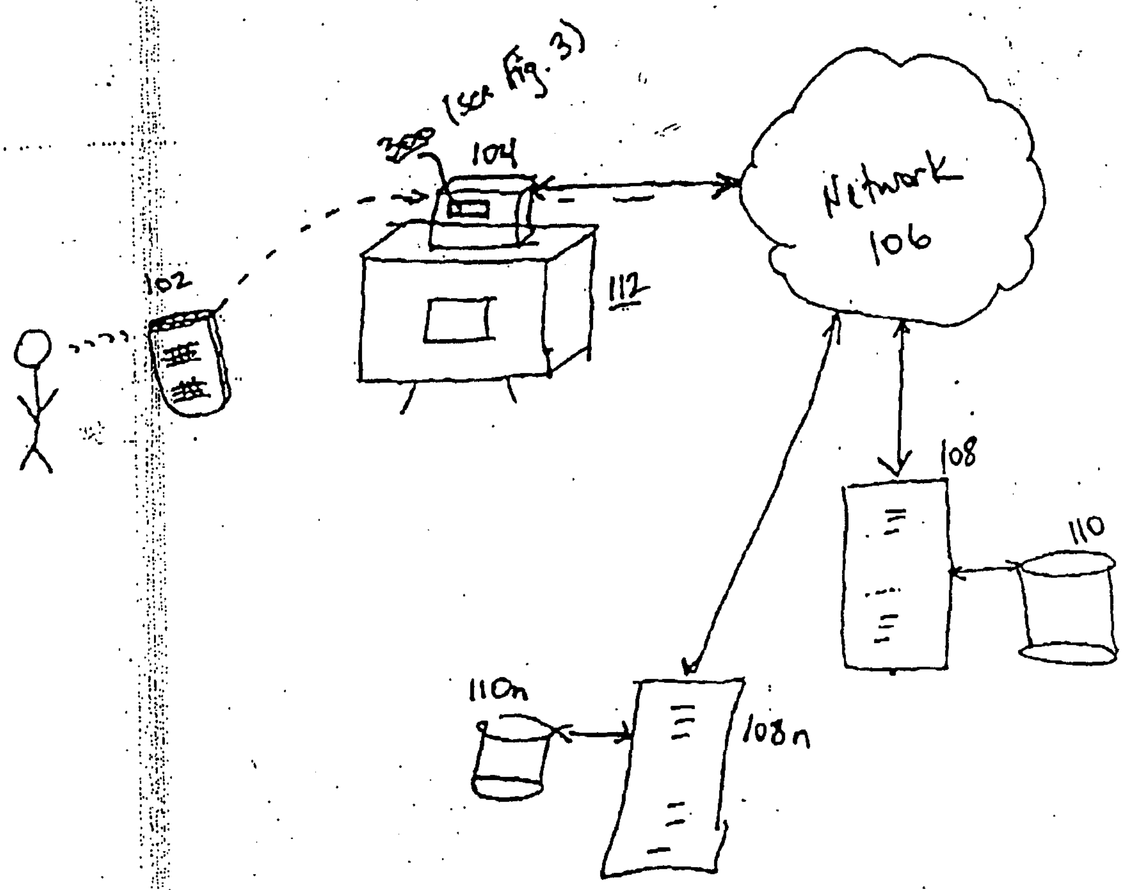

Fig. 1b

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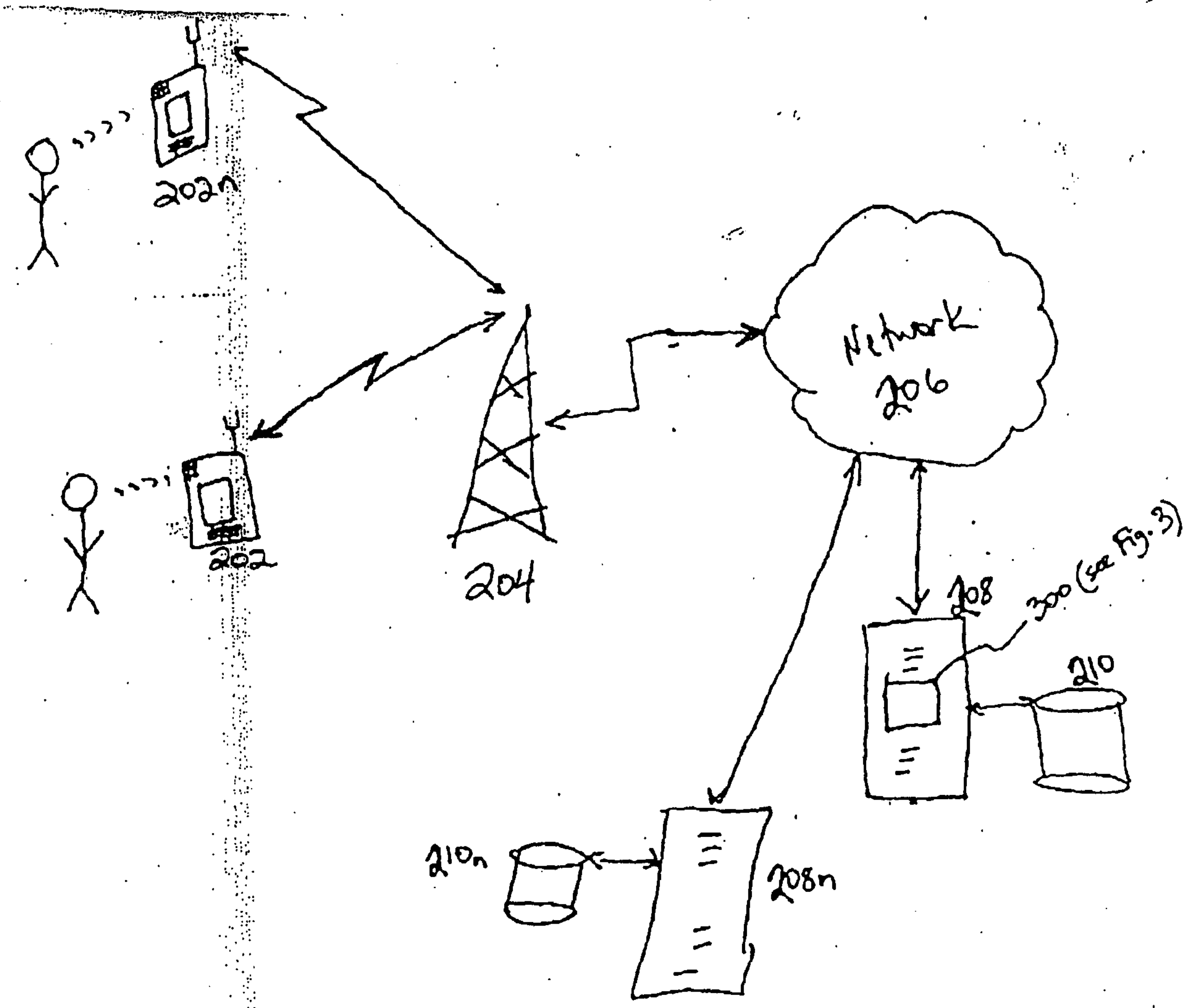

Fig. 2

Request Processing logic 300

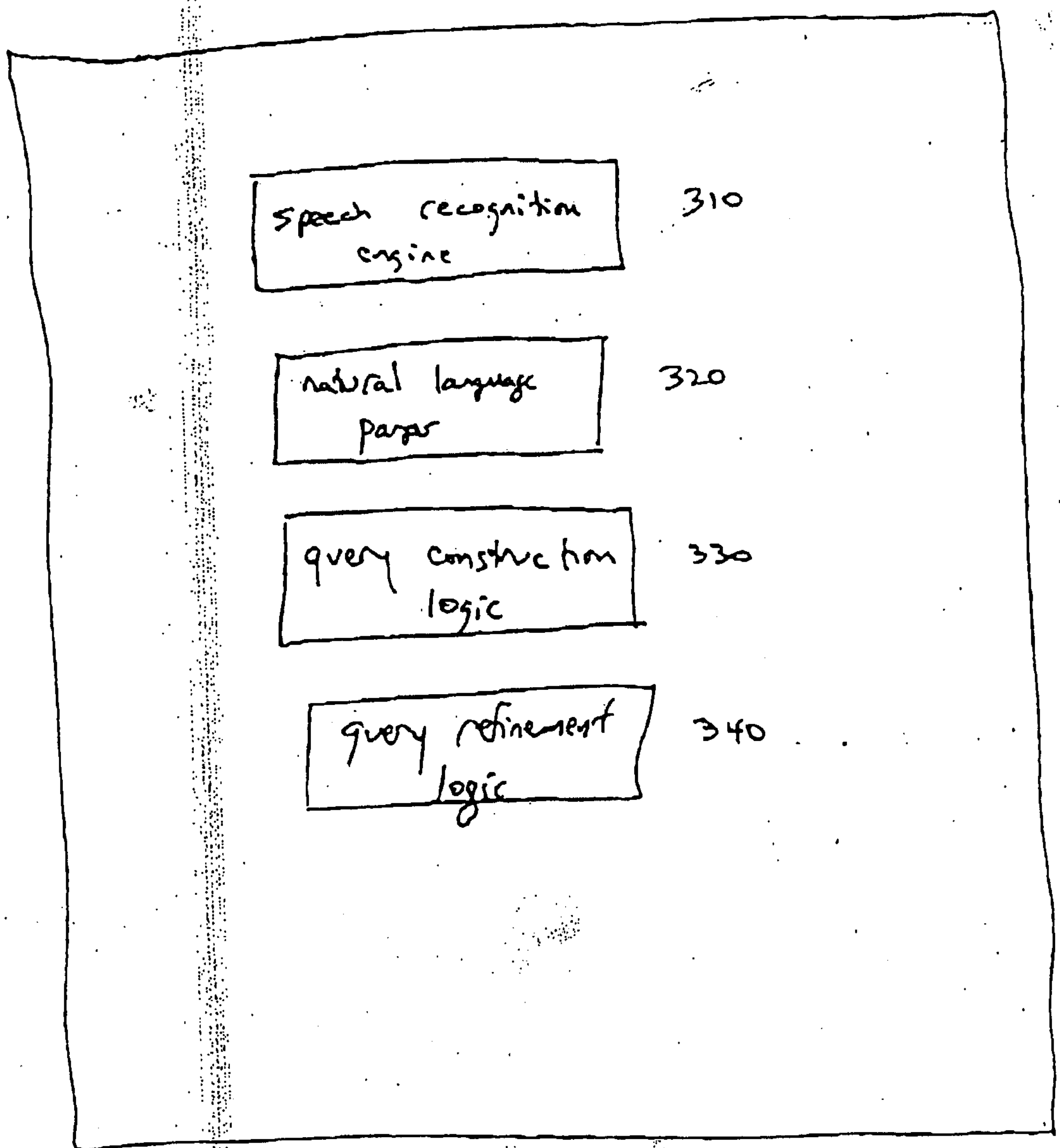

Fig. 3

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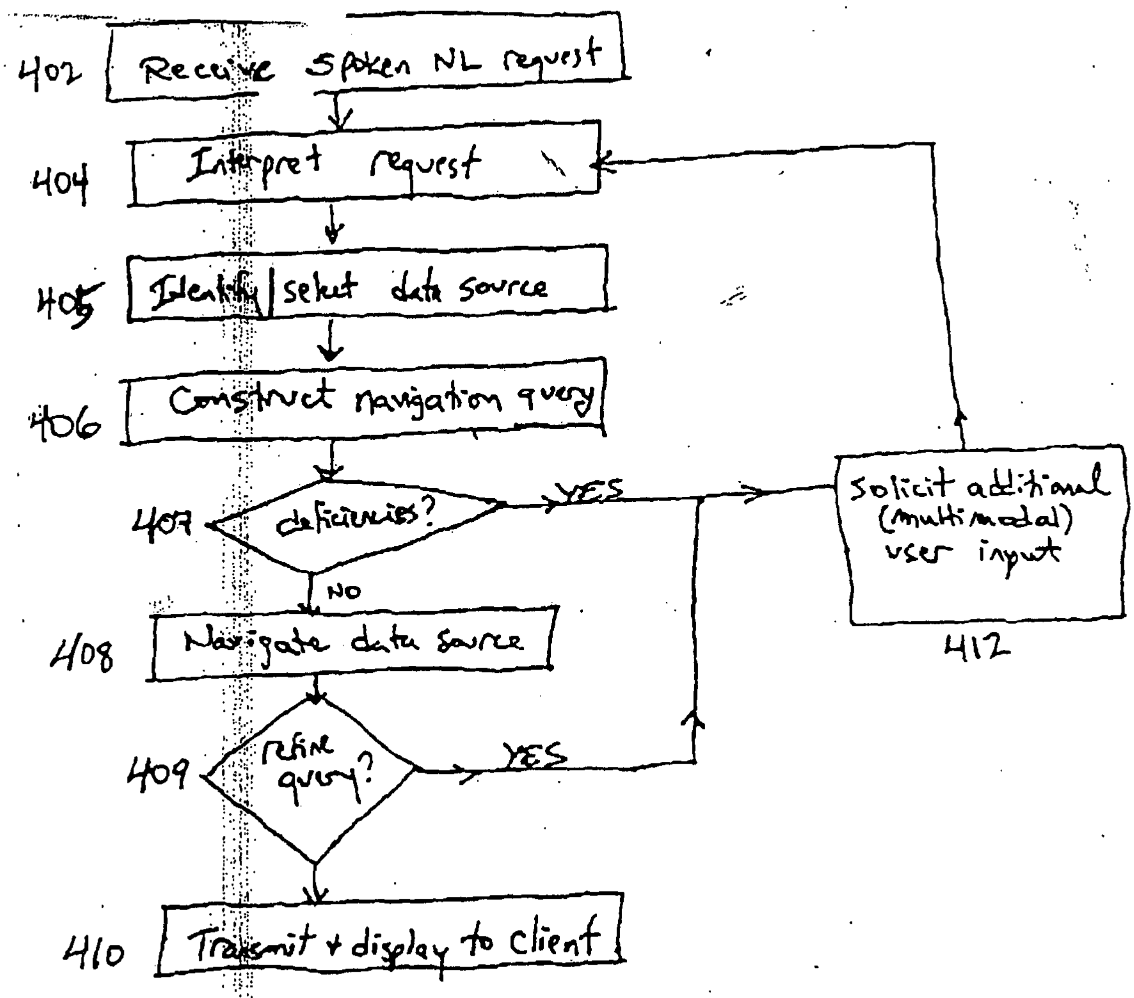

Fig. 4

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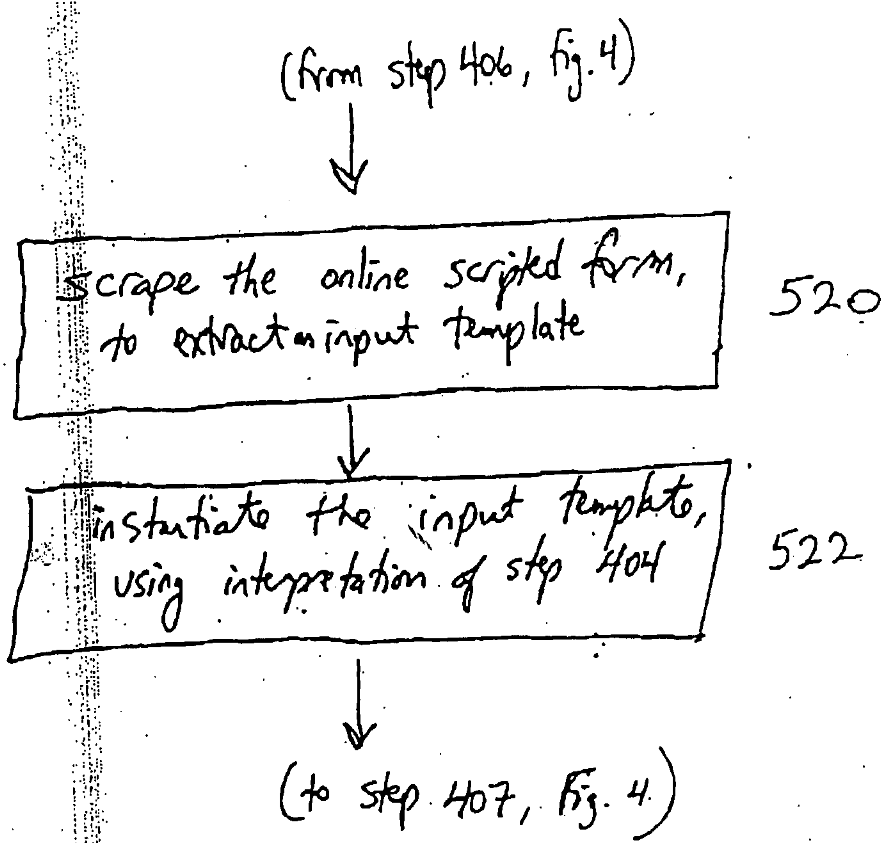

Fig. 5

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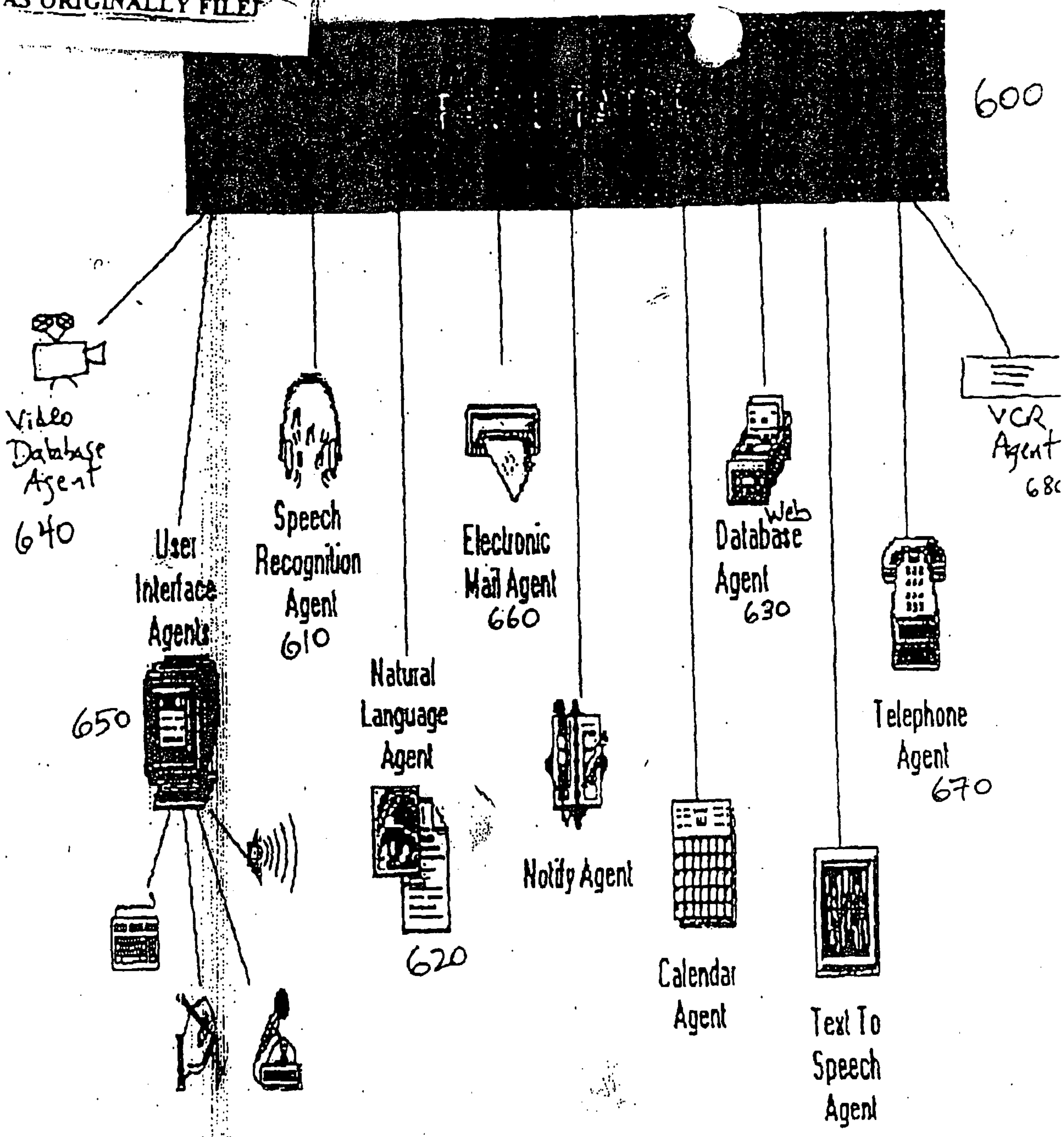

Fig. 6

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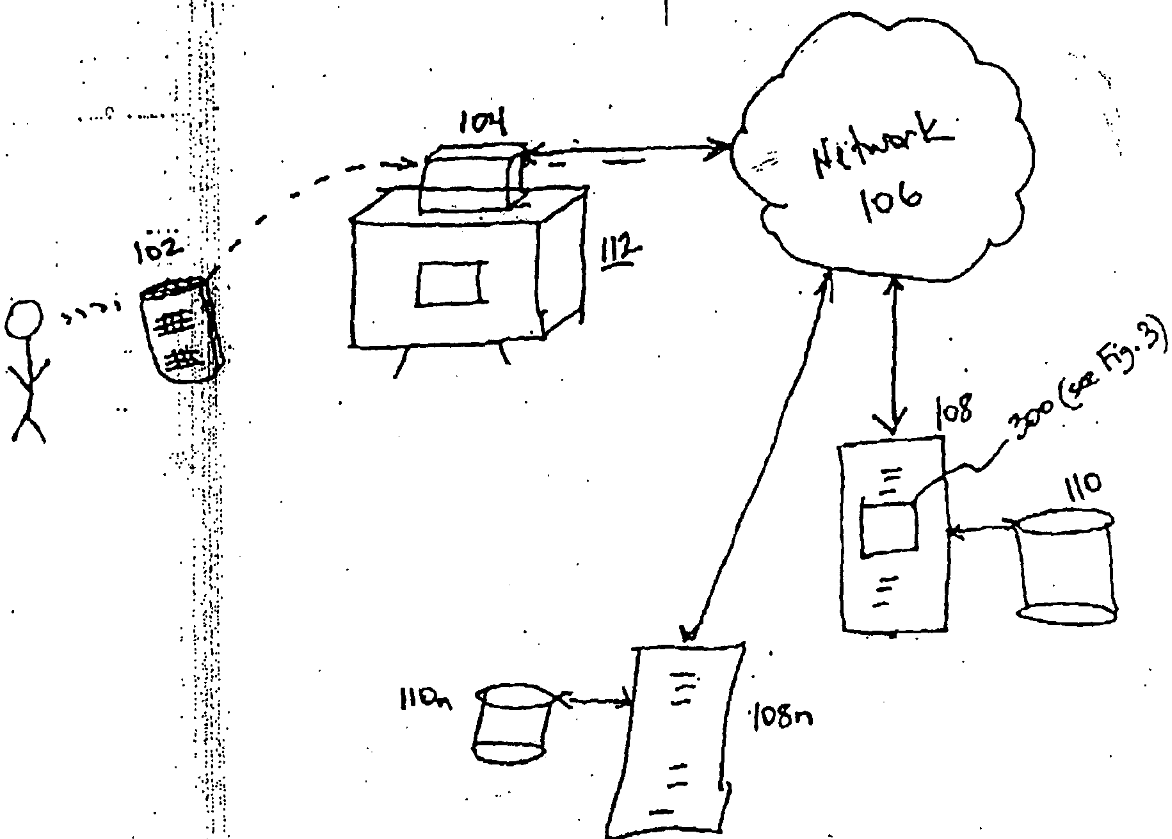

Fig. 1a

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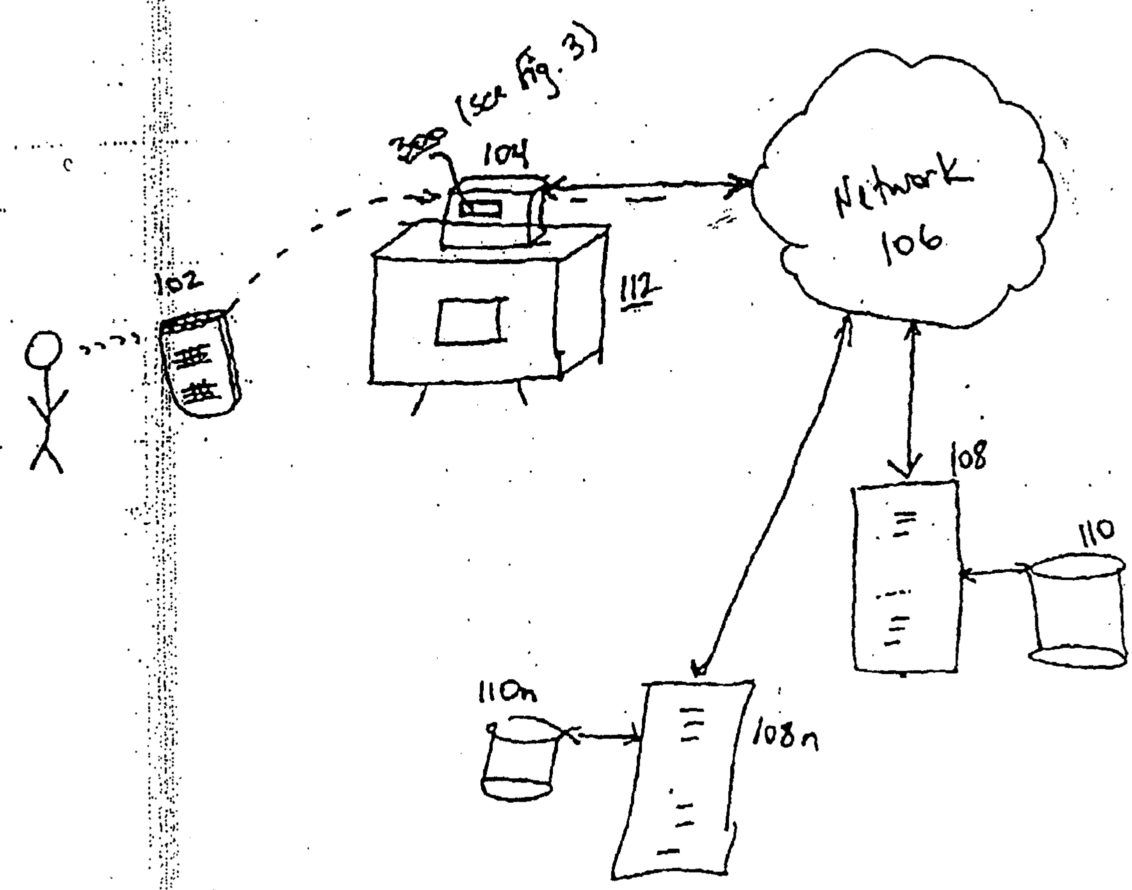

Fig. 1b

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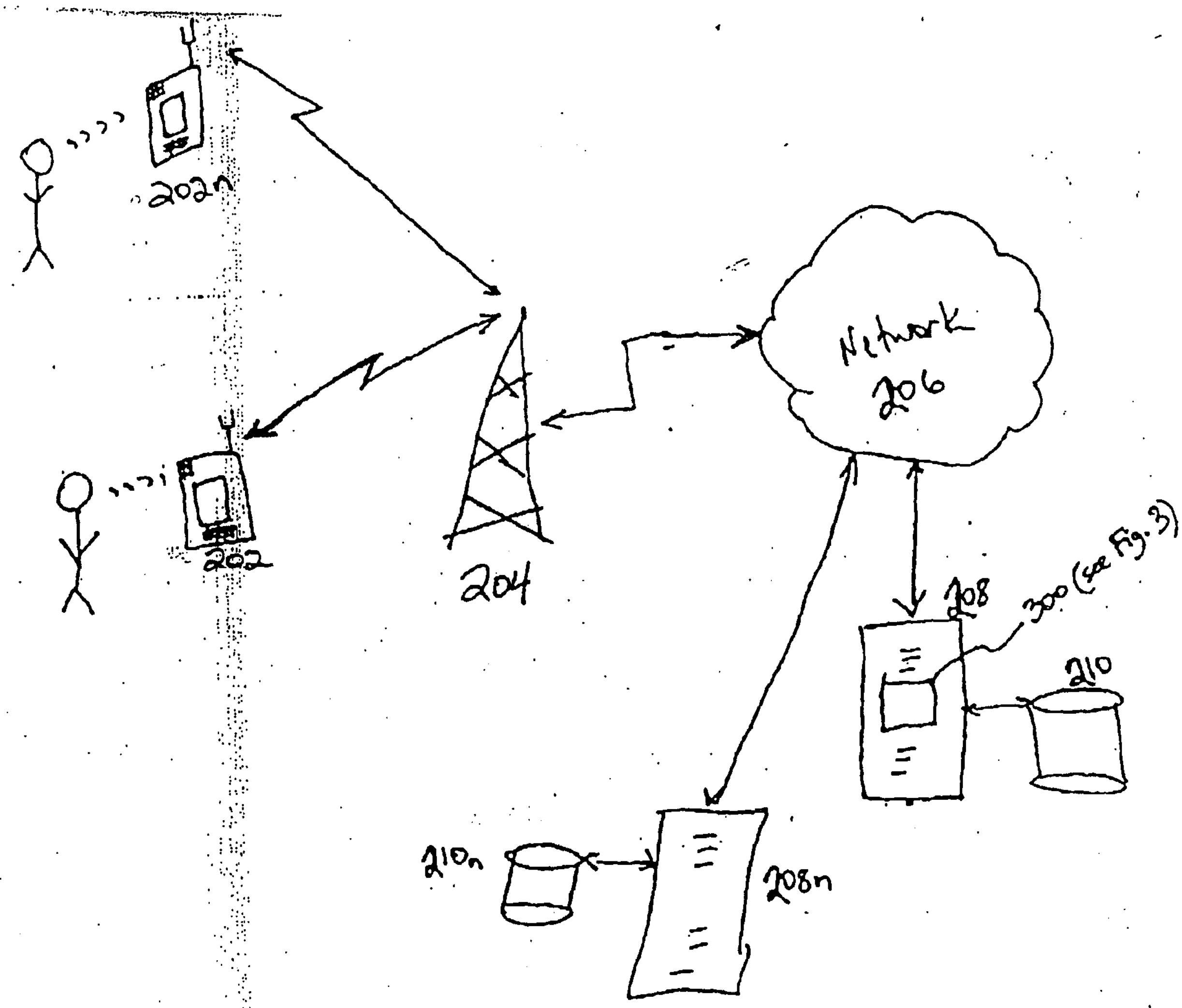

Fig. 2

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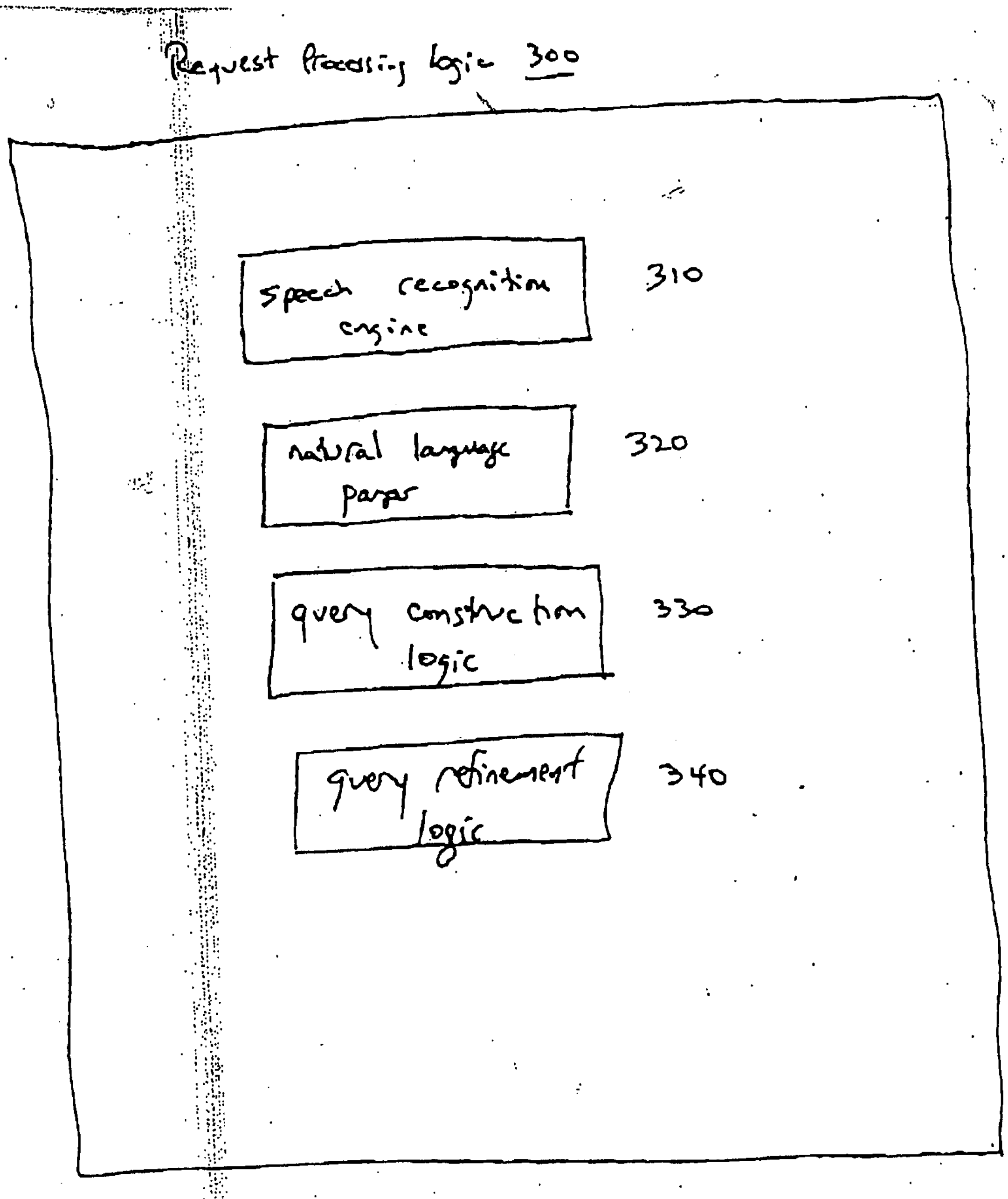

Fig. 3

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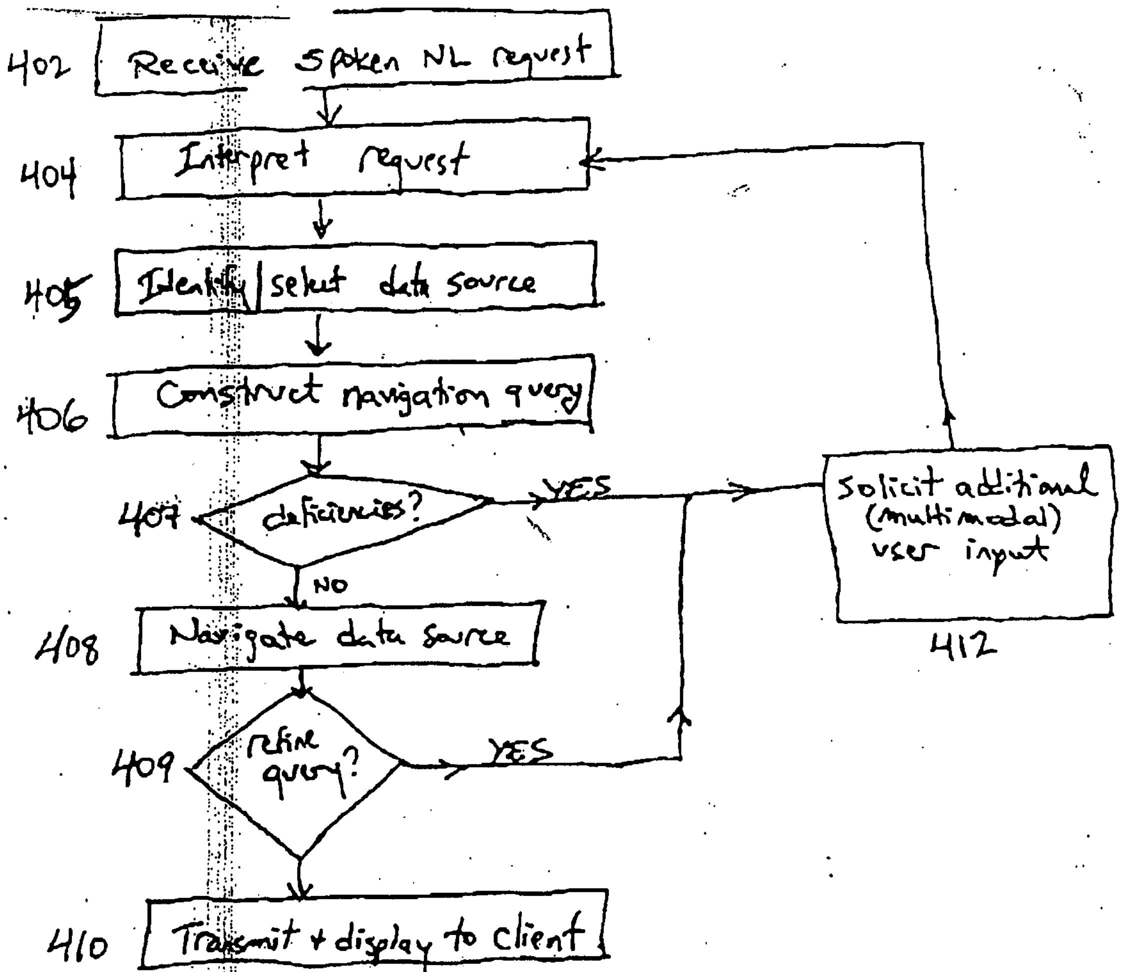


Fig. 4

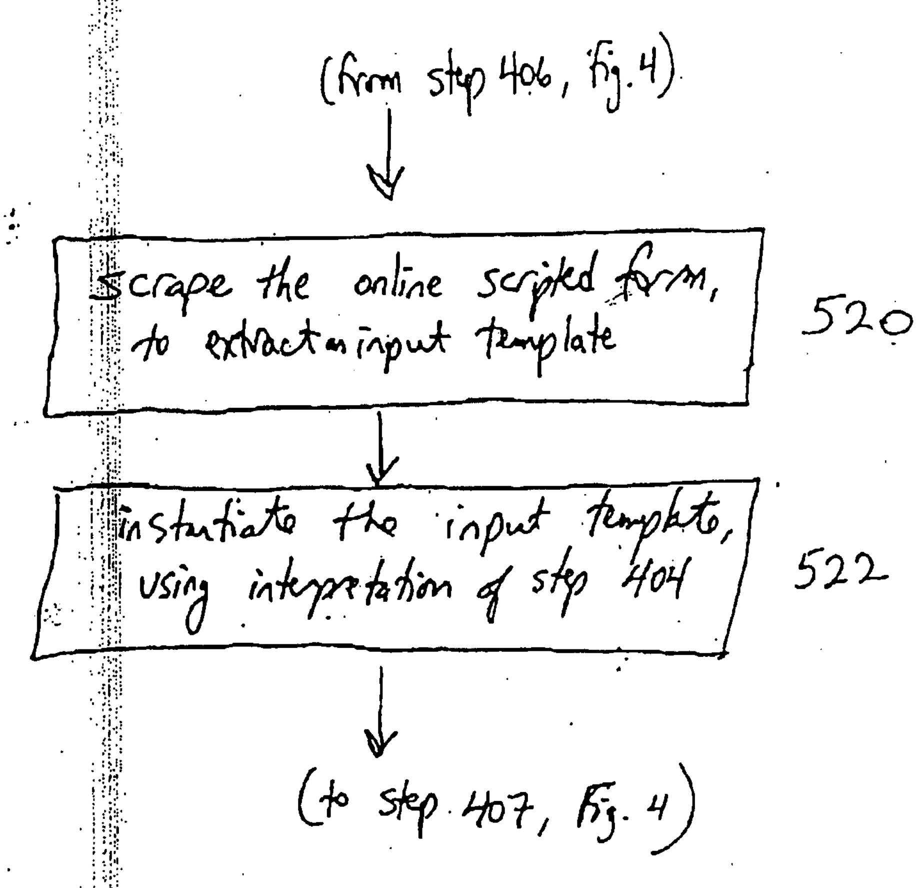
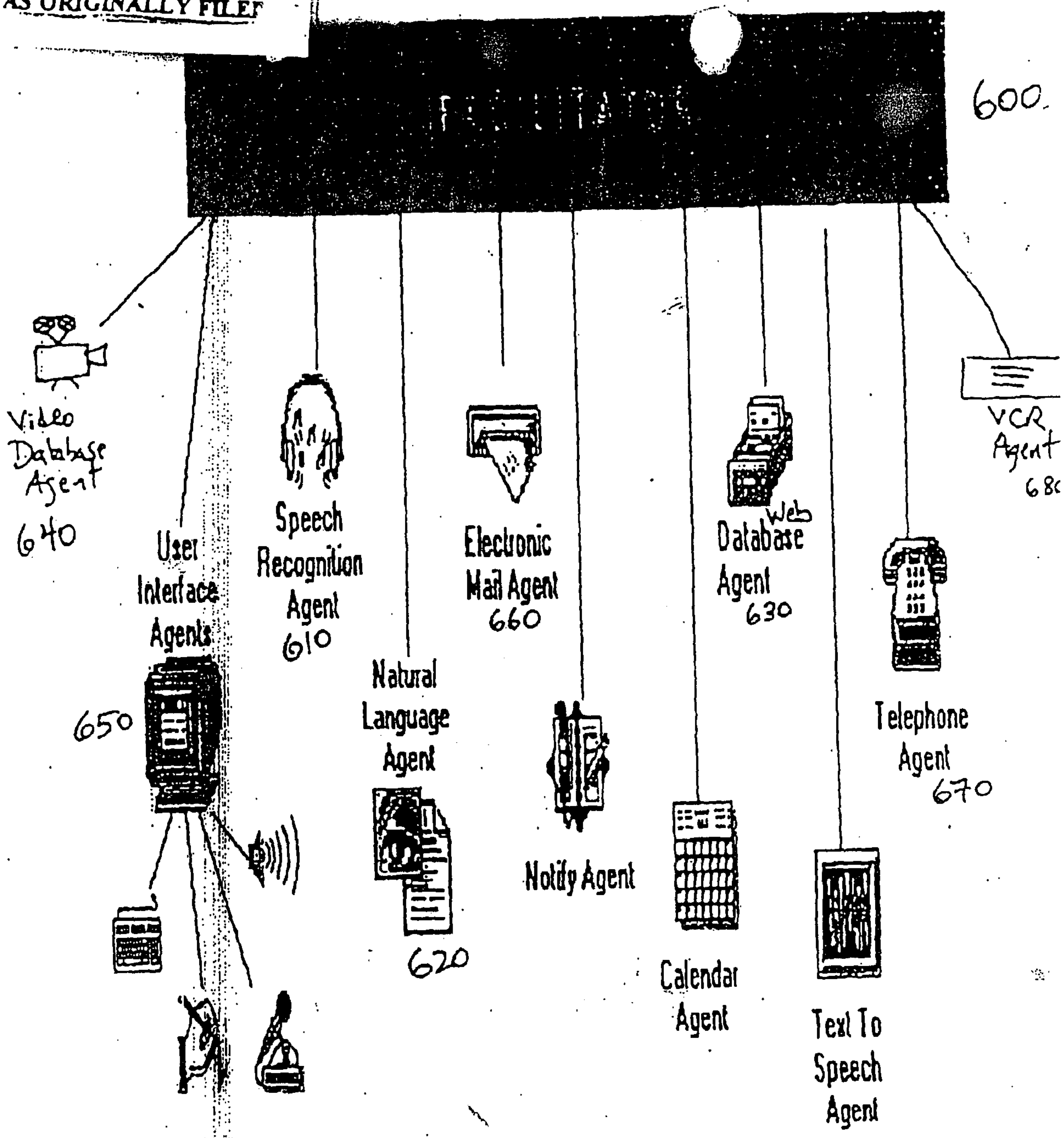

(from step 406, Fig. 4)
Scrape the online scripted form, to extract an input template
520
instantiate the input template, using interpretation of step 404
522
(to step 407, Fig. 4)

Fig. 5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Video Database Agent
640
User Interface Agents
650
Speech Recognition Agent
610
Natural Language Agent
620
Electronic Mail Agent
660
Notify Agent
Web Database Agent
630
Calendar Agent
Text To Speech Agent
Telephone Agent
670
VCR Agent

Fig. 6

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Phone # 408-971-4660	Phone # 650-859-6631
Fax # 408-971-4660	Fax # 650.859-6420

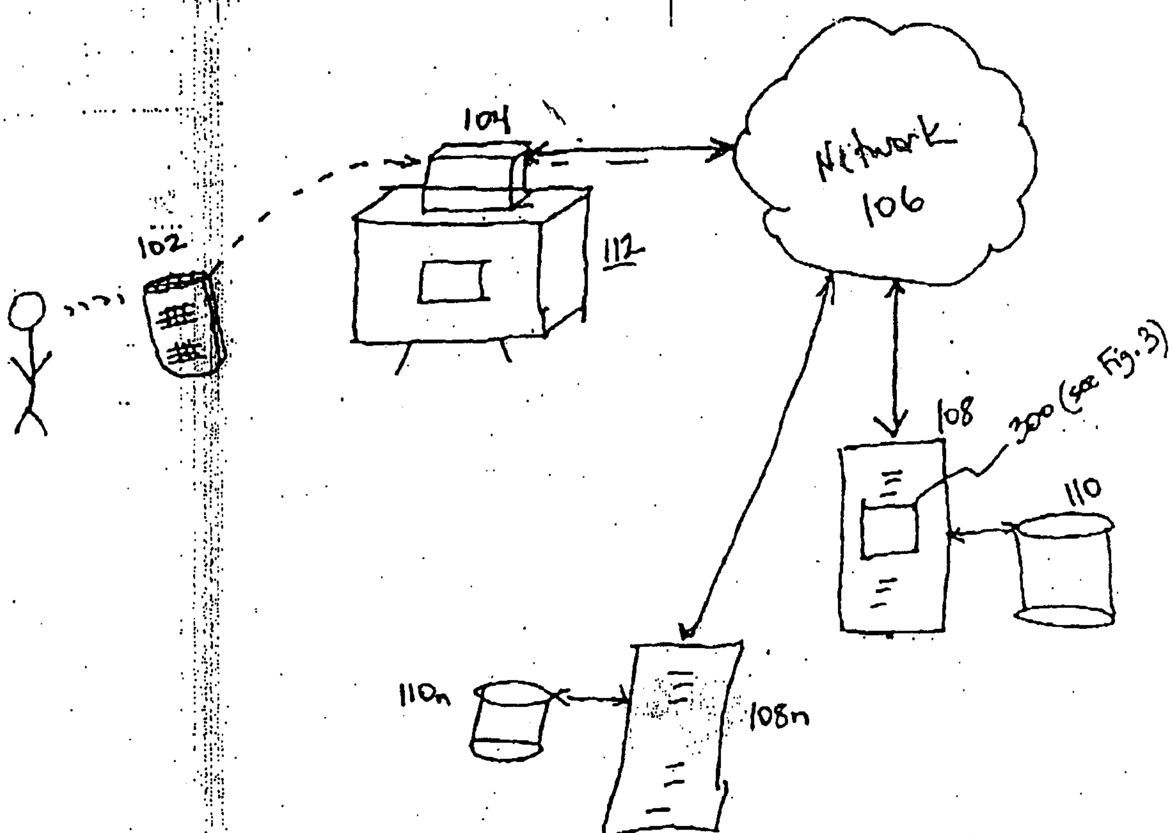

Fig. 1a

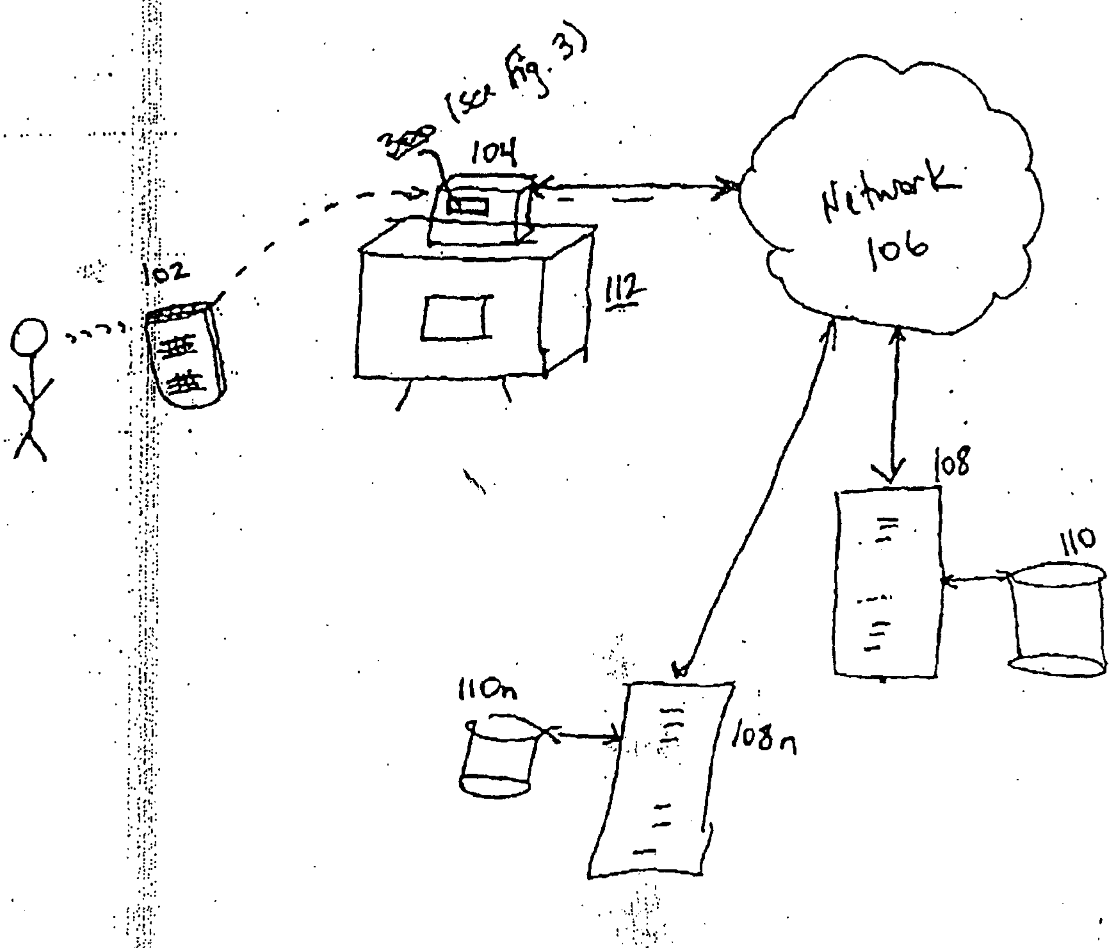

Fig. 1b

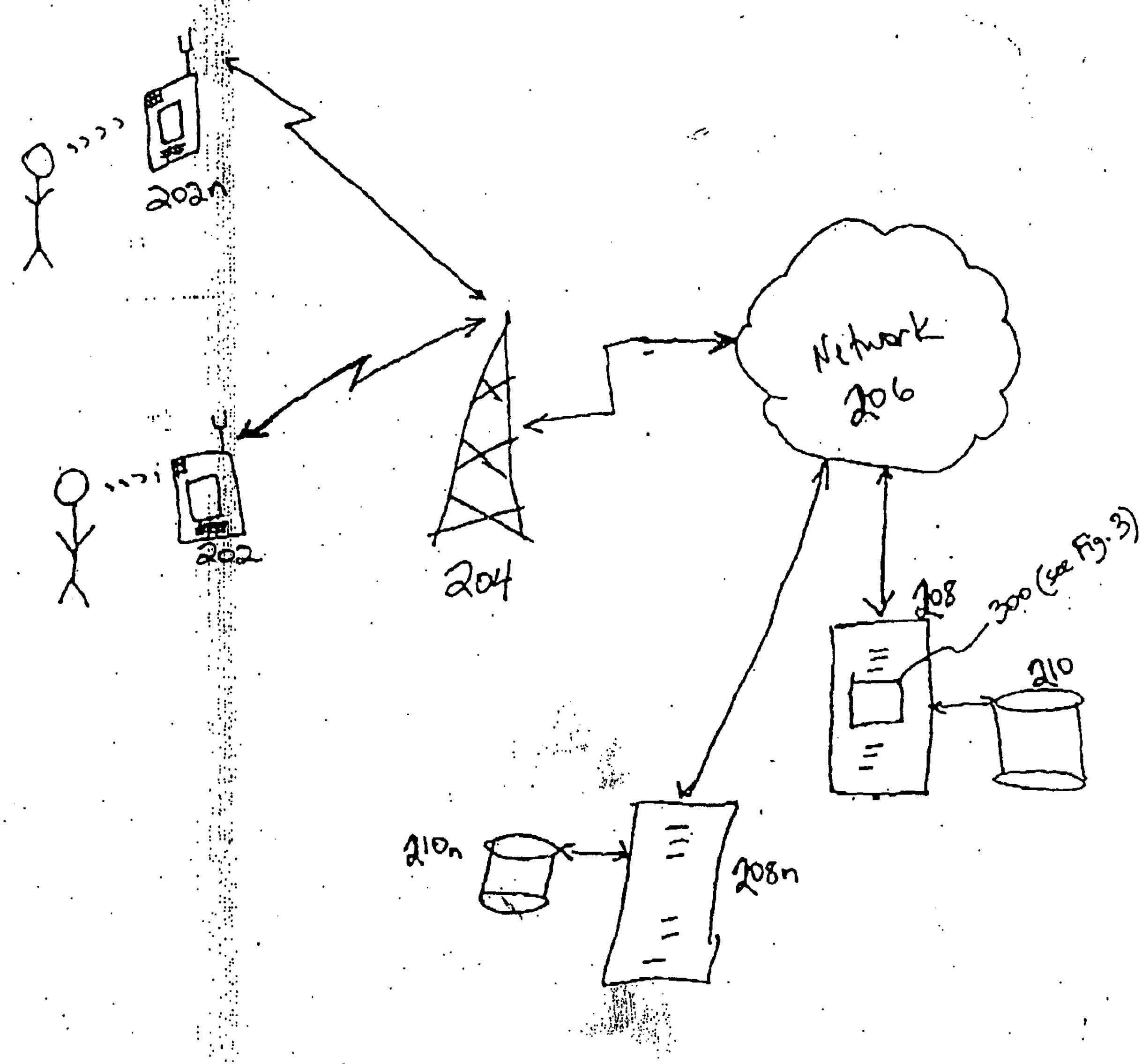

Fig. 2

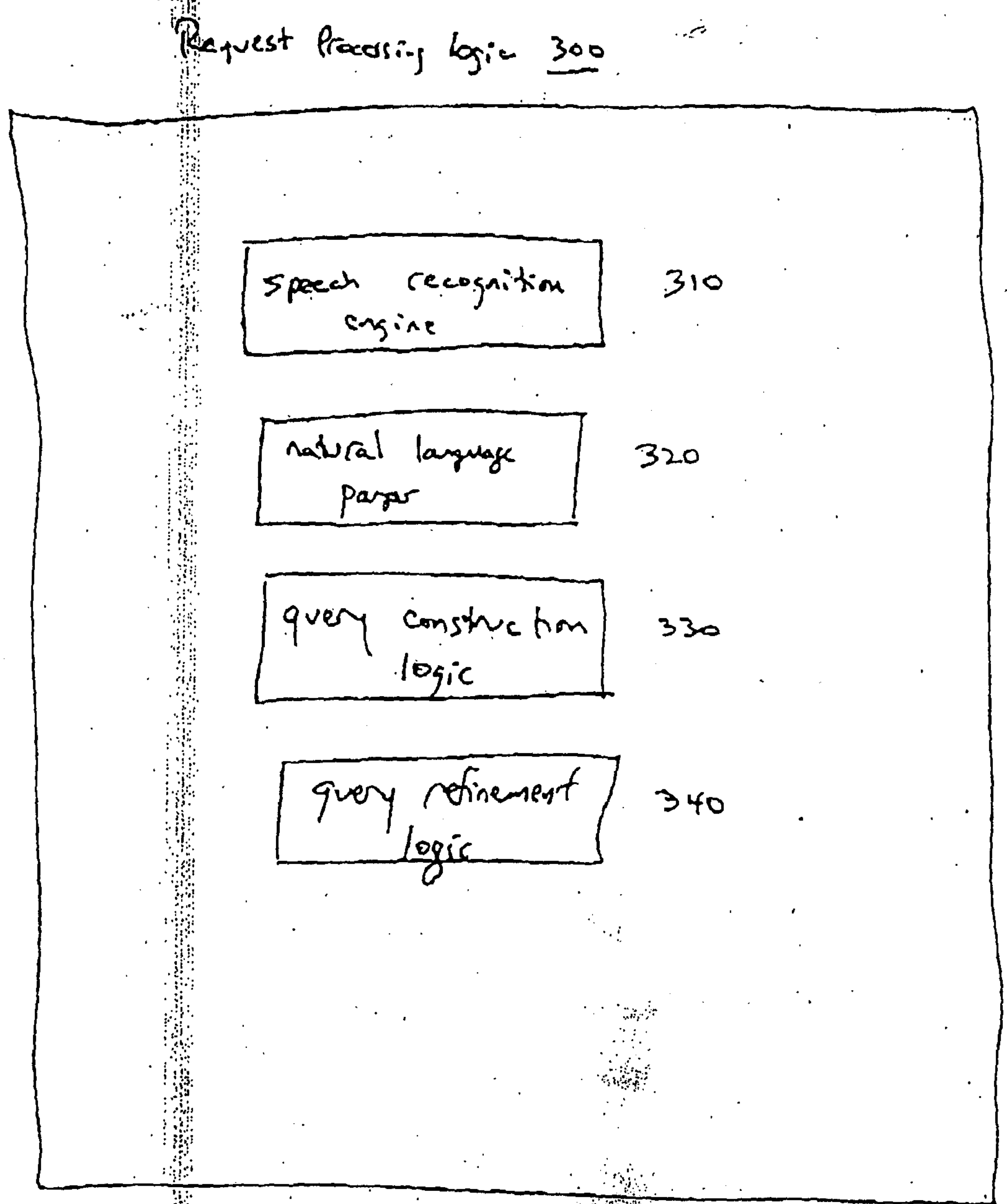
Request Processing logic 300
speech recognition engine
310
natural language parser
320
query construction logic
330
query refinement logic
340

Fig. 3

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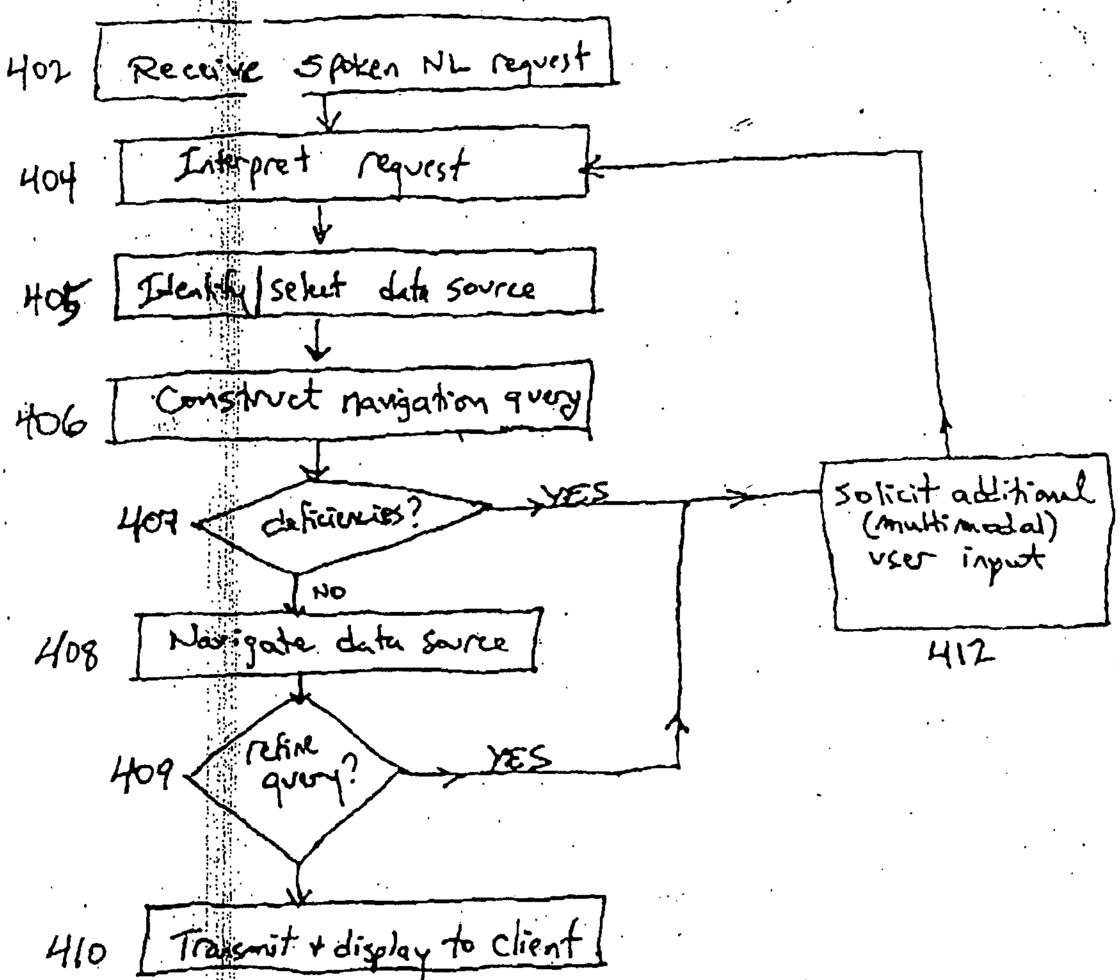

Fig. 4

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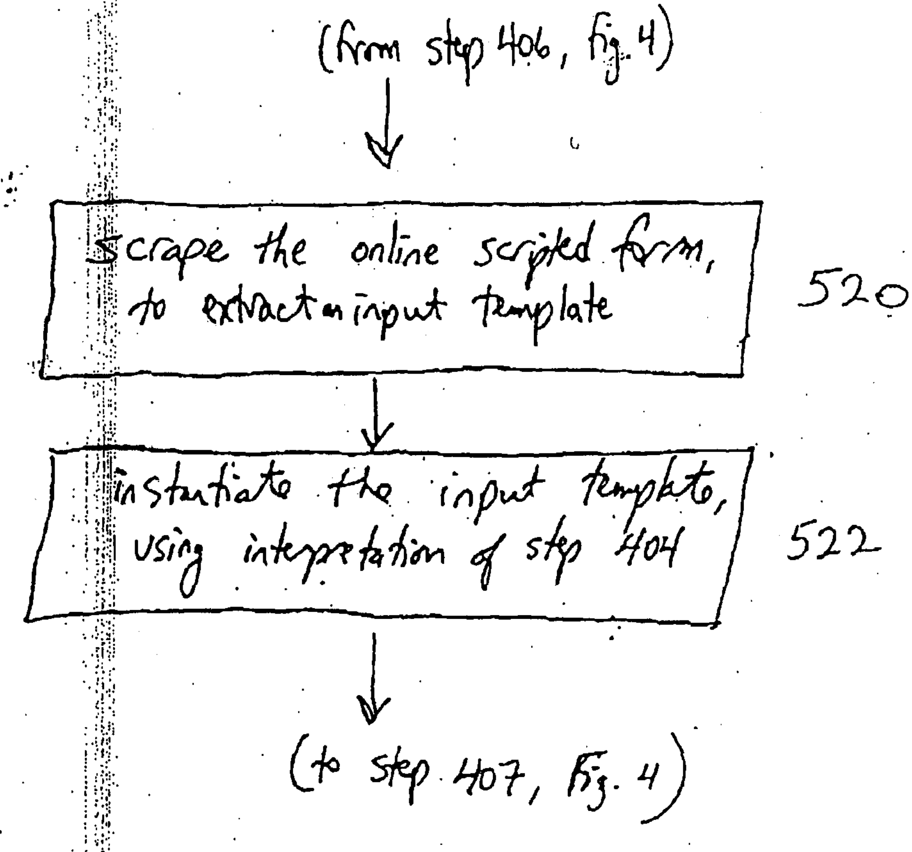

Fig. 5

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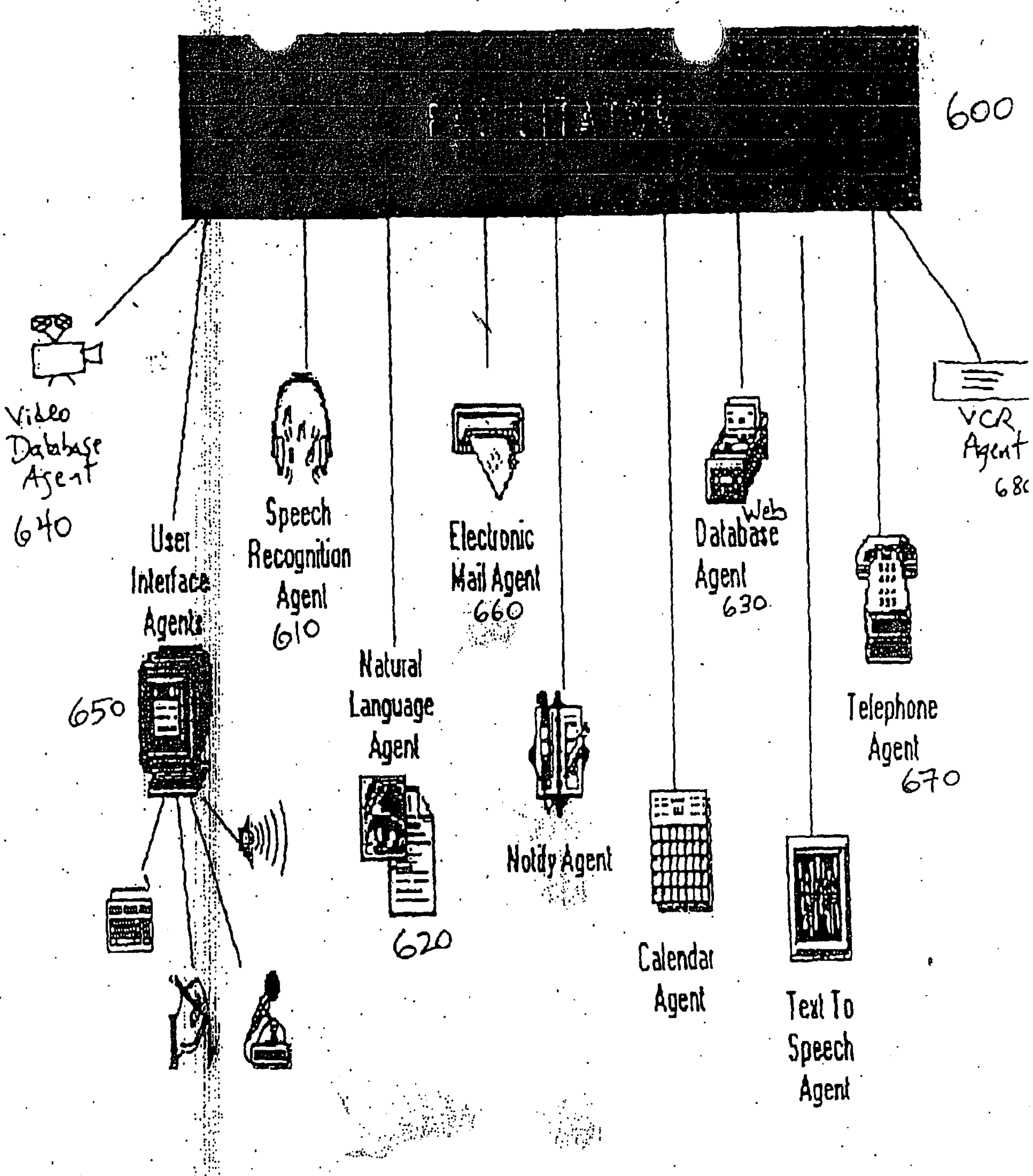
600
Video Database Agent
640
User Interface Agents
650
Speech Recognition Agent
610
Natural Language Agent
620
Electronic Mail Agent
660
Notify Agent
Calendar Agent
Text To Speech Agent
Web Database Agent
630
Telephone Agent
670
VCR Agent

Fig. 6

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

#5/B
LDJ
4-20-01
entered

In re the application of	)	Docket:
Christine HALVERSEN et al.	)	SRI1P037B
Application No. 09/~~524,095~~ 608,872	)	
Filed: March 13, 2000	)	Date: June 30, 2000
For: NAVIGATING NETWORK BASED ELECTRONIC INFORMATION USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK	)	

09608872 .063000

Preliminary Amendment

Assistant Commissioner for Patents
and Trademarks
Washington, DC 20231

Dear Sir:

In regard to the above-named patent application, please enter the following amendments.

IN THE TITLE:

Please delete "NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK", and insert therefore, --MOBILE NAVIGATION OF NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN INPUT--.

IN THE ABSTRACT:

Please delete the Abstract and insert therefore --A system, method, and article of manufacture are provided for navigating an electronic data source by means of spoken language where a portion of the data link between a mobile information appliance of the user and the data

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source utilizes wireless communication. When a spoken input request is received from a user who is using the mobile information appliance, it is interpreted. The resulting interpretation of the request is thereupon used to automatically construct an operational navigation query to retrieve the desired information from one or more electronic network data sources, which is transmitted to the mobile information appliance.--

B1 end

IN THE SPECIFICATION:

On page 1, line 5, please delete "This is" and insert therefore, --This application is a continuation of an application entitled NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK which was filed on March 13, 2000 under serial number 09/524,095 and which is--.

B2

Please delete page 3, lines 3 to 32, and insert therefore, --The present invention addresses the above needs by providing a system, method, and article of manufacture for mobile navigation of network-based electronic data sources in response to spoken input requests. When a spoken input request is received from a user using a mobile information appliance that communicates with a network server via an at least partially wireless communications system, it is interpreted, such as by using a speech recognition engine to extract speech data from acoustic voice signals, and using a language parser to linguistically parse the speech data. The interpretation of the spoken request can be performed on a computing device locally with the user, such as the mobile information appliance, or remotely from the user. The resulting interpretation of the request is thereupon used to automatically construct an operational navigation query to retrieve the desired information from one or more electronic network data sources, which is then transmitted to a client device of the user. If the network data source is a database, the navigation query is constructed in the format of a database query language.

B3

Typically, errors or ambiguities emerge in the interpretation of the spoken request, such that the system cannot instantiate a complete, valid navigational template. This is to be expected occasionally, and one preferred aspect of the invention is the ability to handle such errors and ambiguities in relatively graceful and user-friendly manner. Instead of simply rejecting such input and defaulting to traditional input modes or simply asking the user to try again, a preferred embodiment of the present invention seeks to converge rapidly toward instantiation of a valid navigational template by soliciting additional clarification from the user as necessary, either before or after a navigation of the data source, via multimodal input, i.e., by means of menu

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selection or other input modalities including and in addition to spoken input. This clarifying, multi-modal dialogue takes advantage of whatever partial navigational information has been gleaned from the initial interpretation of the user's spoken request. This clarification process continues until the system converges toward an adequately instantiated navigational template, which is in turn used to navigate the network-based data and retrieve the user's desired information. The retrieved information is transmitted across the network and presented to the user on a suitable client display device.

33 end

IN THE CLAIMS:

Please delete claims 1-55, and insert therefore the following claims ~~1-27~~ 56 82:

56 ~~1.~~ ~~(New)~~ A method for speech-based navigation of an electronic ~~data source located at one~~ or more network servers located remotely from a user, wherein at least a portion of a data link between a mobile information appliance of the user and the one or more network servers utilizes wireless communication, comprising the steps of:

(a) receiving a spoken request for desired information from the user utilizing the mobile information appliance of the user;

(b) rendering an interpretation of the spoken request;

(c) constructing a navigation query based upon the interpretation;

(d) utilizing the navigation query to select a portion of the electronic data source; and

(e) transmitting the selected portion of the electronic data source from the network ~~server to the mobile information appliance of the user.;~~

34

2 ~~57~~ ~~2.~~ (New) The method of claim ~~1~~ ~~56~~ 1, wherein the step of rendering the interpretation of the spoken request is performed at the one or more network servers.

3 ~~58~~ ~~3.~~ (New) The method of claim ~~1~~ ~~56~~ 1, wherein the step of rendering the interpretation of the spoken request is performed by the mobile information appliance.

4 ~~59~~ ~~4.~~ (New) The method of claim ~~1~~ ~~56~~ 1, further comprising the steps of soliciting additional input from the user, including user interaction in a modality different than the original request;

refining the navigation query, based upon the additional input; and using the refined navigation query to select a portion of the electronic data source.

5 ~~60~~ ~~5.~~ (New) The method of claim 1 ~~56~~ ~~1~~, wherein the data link includes a cellular telephone system.

6 ~~61~~ ~~6.~~ (New) The method of claim 1 ~~56~~ ~~1~~, wherein steps (a)-(d) are performed with respect to multiple users.

7 ~~62~~ ~~7.~~ (New) The method of claim 1 ~~56~~ ~~1~~, wherein the mobile information appliance is a wireless telephone.

8 ~~63~~ ~~8.~~ (New) The method of claim 1 ~~56~~ ~~1~~, wherein the mobile information appliance is a portable computing device.

B4

9 ~~64~~ ~~9.~~ (New) The method of claim 8 ~~63~~ ~~8~~, wherein the portable computing device is a personal digital assistant.

65 ~~10.~~ ~~(New) A computer program embodied on a~~ computer readable medium for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, wherein at least a portion of a data link between a mobile information appliance of the user and the one or more network servers utilizes wireless communication, comprising:

(a) a code segment that receives a spoken request for desired information from the user utilizing the mobile information appliance of the user;

(b) a code segment that renders an interpretation of the spoken request;

(c) a code segment that constructs a navigation query based upon the interpretation;

(d) a code segment that utilizes the navigation query to select a portion of the electronic data source; and

(e) a code segment that transmits the selected portion of the electronic data source from the network server to the mobile information appliance of the user.

30 B

11 ~~66~~ ~~11~~. (New) The computer program of claim 10 ~~65~~ ~~10~~, wherein the rendering of the interpretation of the spoken request is performed at the one or more network servers.

12 ~~67~~ ~~12~~. (New) The computer program of claim 10 ~~65~~ ~~10~~, wherein the rendering of the interpretation of the spoken request is performed by the mobile information appliance.

Rule 1.126

13 ~~68~~ ~~13~~. (New) The computer program of claim 10 ~~65~~ ~~10~~, further comprising a code segment that solicits additional input from the user, including user interaction in a modality different than the original request; a code segment that refines the navigation query, based upon the additional input; and a code segment that uses the refined navigation query to select a portion of the electronic data source.

B4

14 ~~69~~ ~~14~~. (New) The computer program of claim 10 ~~65~~ ~~10~~, wherein the data link includes a wireless telephone system.

15 ~~70~~ ~~15~~. (New) The computer program of claim 10 ~~65~~ ~~10~~, wherein code segments (a)-(d) are executed with respect to multiple users.

16 ~~71~~ ~~16~~. (New) The computer program of claim 10 ~~65~~ ~~10~~, wherein the mobile information appliance is a wireless telephone.

17 ~~72~~ ~~17~~. (New) The computer program of claim 10 ~~65~~ ~~10~~, wherein the mobile information appliance is a portable computing device.

18 ~~73~~ ~~18~~. (New) The computer program of claim 17 ~~72~~ ~~17~~, wherein the portable computing device is a personal digital assistant.

Amd B

~~74~~ ~~19~~. ~~(New) A system for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, comprising:~~

~~(a) a mobile information appliance operable to receive a spoken request for desired information from the user;~~

~~(b) spoken language processing logic, operable to render an interpretation of the spoken request;~~

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Amd D3

(c) query construction logic, operable to construct a navigation query based upon the interpretation;

(d) navigation logic, operable to select a portion of the electronic data source using the navigation query; and

(e) electronic communications infrastructure for transmitting the selected portion of the electronic data source from the network server to the mobile information appliance of the user, wherein at least a portion of a data link of the electronic communications infrastructure between a mobile information appliance of the user and the one or more network servers utilizes wireless communication.

34

20 ~~75~~ ~~20.~~ (New) The system of claim 19 ~~74~~ ~~19~~, wherein the spoken language processing logic renders the interpretation of the spoken request at the one or more network servers.

21 ~~76~~ ~~21.~~ (New) The system of claim 19 ~~74~~ ~~19~~, wherein the spoken language processing logic renders the interpretation of the spoken request at the mobile information appliance.

22 ~~77~~ ~~22.~~ (New) The system of claim 19 ~~74~~ ~~19~~, further comprising user interaction logic operable to solicit additional input from the user, including user interaction in a modality different than the original request; and query refining logic operable to refine the navigation query based upon the additional input; wherein the navigation logic users the refined navigation query to select a portion of the electronic data source.

23 ~~78~~ ~~23.~~ (New) The system of claim 19 ~~74~~ ~~19~~, wherein the data link includes a cellular telephone system.

24 ~~79~~ ~~24.~~ (New) The system of claim 19 ~~74~~ ~~19~~, wherein the system operates with respect to multiple users.

25 ~~80~~ ~~25.~~ (New) The system of claim 19 ~~74~~ ~~19~~, wherein the mobile information appliance is a wireless telephone.

26 ~~81~~ ~~26.~~ (New) The system of claim 19 ~~74~~ ~~19~~, wherein the mobile information appliance is a portable computing device.

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27
~~22~~
~~27.~~ (New) The system of claim ~~26~~ 26, wherein the portable computing device is a personal digital assistant.

B4 end

In the event a telephone conversation would expedite the prosecution of this application, the Examiner may reach the undersigned at (408) 505-5100. If any fees are due in connection with the filing of this paper, then the Commissioner is authorized to charge such fees to Deposit Account No. 50-1351 (Order No. SRI1P037B). A duplicate copy of the transmittal is enclosed for this purpose.

Respectfully submitted,

Kevin J. Zilka
Registration No. 41,429

P.O. Box 721030
San Jose, CA 95172
Telephone: (408) 505-5100

33 B

File History Content Report

The following content is missing from the original file history record obtained from the United States Patent and Trademark Office. No additional information is available.

Document Date - 2000-08-31

Document Title - USPTO Communication Re: Change of Address

UNITED STATES PATENT AND TRADEMARK OFFICE

COMMISSIONER FOR PATENTS
UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. 20231
www.uspto.gov

APPLICATION NUMBER	FILING/RECEIPT DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NUMBER
09/608,872	06/30/2000	Christine Halversen	SR1lp037B

Kevin J Zilka
P O Box 721030
San Jose, CA 95172-1030

FORMALITIES LETTER

OC000000005370740

Date Mailed: 09/01/2000

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given TWO MONTHS from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The oath or declaration is missing.
  A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.
- To avoid abandonment, a late filing fee or oath or declaration surcharge as set forth in 37 CFR 1.16(e) of $65 for a small entity in compliance with 37 CFR 1.27, must be submitted with the missing items identified in this letter.

- **The balance due by applicant is $ 65.**

A copy of this notice MUST be returned with the reply.

M. Middleton
Customer Service Center
Initial Patent Examination Division (703) 308-1202
PART 3 - OFFICE COPY

OIPE JC131
NOV 02 2000
PATENT & TRADEMARK OFFICE

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of	
Halverson et al.	Examiner: Not Assigned
Application No. 09/608,872	Art Unit: 2741
Filed: June 30, 2000	Atty. Docket No. SRI1P037B
For: MOBILE NAVIGATION OF NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN INPUT	Date: October 30, 2000

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, ~~D.C. 20231 on October 30,~~ 2000.

Signed: [signature]
Julie A. Curts

RESPONSE TO NOTICE TO FILE MISSING PARTS

Assistant Commissioner for Patents
Box: Missing Parts
Washington, D.C. 20231

Sir:

In response to the Notice to File Missing Parts of Application--Filing Date Granted dated September 1, 2000, Applicants hereby attach an original executed Declaration and Power of Attorney, and the copy of the Notice to be returned with this response.

Applicants are also attaching Check No. 238 for $65.00 in payment of the surcharge fee. The Commissioner is authorized to charge any other fees that may be due to our Deposit Account No. 50-1351 (Order No. SRI1P037B). A copy of this sheet is enclosed for this purpose.

Respectfully submitted,
SILICON VALLEY IP LAW GROUP

Kevin J. Zilka
Reg. No 41,429

P.O. Box 721030
San Jose, CA 95172-1030
(408) 505-5100

DECLARATION AND POWER OF ATTORNEY FOR ORIGINAL U.S. PATENT APPLICATION

Attorney's Docket No. SRI1P037

As a below-named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: NAVIGATING NETWORK-BASED ELECTRONIC INFORMATIN USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK, the specification of which,

(check one)

1. ☐ is attached hereto.

2. ☒ was filed on March 13, 2000 as U.S. Application Serial No. 09/524,095 and was amended on ______.

3. ☐ was filed on ______ as International PCT Application Serial No. ______ and was amended on ______.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, CFR § 1.56.

I hereby claim foreign priority benefits under Title 35, United States code, § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

(Appl. No.)	(Country)	(Filing Date)	Priority Benefits Claimed?
			☐Yes ☐No
			☐Yes ☐No
			☐Yes ☐No

I hereby claim the benefit under 35 U.S.C. §119(e) of any United States provisional application(s) listed below:

(Application Serial No.)	(Filing Date)

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s), or § 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

Prior U.S. Application(s)

(Application Serial No.) (Filing Date) (Status - patented, pending, abandoned)

(Application Serial No.) (Filing Date) (Status - patented, pending, abandoned)

And I hereby appoint the law firm of Hickman Stephens Coleman & Hughes, including Paul L. Hickman (Reg. No. 28,516); L. Keith Stephens (Reg. No. 32,632); Brian R. Coleman (Reg. No. 39,145); Michael J. Hughes (Reg. No. 29,077); Michael E. Melton (Reg. No. 32,276); Raymond E. Roberts (Reg. No. 38,597); Vidya R. Bhakar (Reg. No. 42,323); Larry B. Guernsey (Reg. No. 40,008); Douglas E. Mackenzie (Reg. No. 38,955); Michael D. Plimier (Reg. No. 43,004); Ronald B. Feece (Reg. No. P46,327); Stefanie M. Howell (Reg. No. P45,929); and Robert D. Hayden (Reg. No. 42,645) as my principal attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

Send Correspondence To: **HICKMAN STEPHENS COLEMAN & HUGHES, LLP**
P.O. BOX 52037
Palo Alto, California 94303-0746

Direct Telephone Calls To: Raymond E. Roberts at telephone number (408) 558-9950

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Typewritten Full Name of Sole or First Inventor: Christine Halverson Citizenship: USA

Inventor's signature: Christine Halverson Date of Signature: 6-16-00

Residence: (City) San Jose (State/Country) California/USA

Post Office Address: 1623 Fairorchard Avenue, San Jose, California 95125

Full Name of Second Joint Inventor (if any): Luc Julia Citizenship: ~~USA~~ FRANCE

Inventor's signature: Date of Signature: 6.21.00

Residence: (City) Menlo Park (State/Country) California/USA

Post Office Address: 607 Menlo Avenue, Menlo Park, California 94025

Full Name of Third Joint Inventor (if any): Dimitris Voutsas Citizenship: Greece

Inventor's signature: Date of Signature: 6/16/00

Residence: (City) Thessaloniki (State/Country) Greece

Post Office Address: 14 M. Pyrza Street, Neoi Epivates, Thessaloniki 57019, Greece

Full Name of Fourth Joint Inventor (if any):	Adam Cheyer	Citizenship:	USA
Inventor's signature:	Adam J. Cheyer	Date of Signature:	6/22/00
Residence: (City)	Palo Alto	(State/Country)	California /USA
Post Office Address:	757 Cereza Drive, Palo Alto, California 94306		

SECTOR 3

#3

UNITED STATES PATENT AND TRADEMARK OFFICE

COMMISSIONER FOR PATENTS
UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. 20231
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APPLICATION NUMBER	FILING/RECEIPT DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NUMBER
09/608,872	06/30/2000	Christine Halversen	SRIIp037B

OIPE JC131
NOV 0 2 2000
PATENT & TRADEMARK OFFICE

Kevin J Zilka
P O Box 721030
San Jose, CA 95172-1030

FORMALITIES LETTER

OC000000005370740

Date Mailed: 09/01/2000

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given TWO MONTHS from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The oath or declaration is missing.
  A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.
- To avoid abandonment, a late filing fee or oath or declaration surcharge as set forth in 37 CFR 1.16(e) of $65 for a small entity in compliance with 37 CFR 1.27, must be submitted with the missing items identified in this letter.

- **The balance due by applicant is $ 65.**

A copy of this notice MUST be returned with the reply.

M. Middleton
Customer Service Center
Initial Patent Examination Division (703) 308-1202
PART 2 - COPY TO BE RETURNED WITH RESPONSE

11/03/2000 HNOOR1 00000067 09608872
01 FC:205 65.00 OP

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/608,872	06/30/00	HALVERSEN C	SRILP037B

024277
Kevin J. Zilka
PO Box 721030
San Jose CA 95172

TM02/0424

EXAMINER	
BACKER,F	
ART UNIT	PAPER NUMBER
2155	6

DATE MAILED: 04/24/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

PTO-90C (Rev.11/00)

1- File Copy

Office Action Summary	Application No. 09/608,872	Applicant(s) HALVERSEN ET AL.
	Examiner Firmin Backer	Art Unit 2155

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 June 2000* .

2a)☐ This action is **FINAL.** 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 56-82 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 56-82 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) ☒ Notice of References Cited (PTO-892)
16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
18) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
19) ☐ Notice of Informal Patent Application (PTO-152)
20) ☐ Other:

DETAILED ACTION

This is in response to a letter for patent filed on June 30th, 2000 in which claims 56-82 are presented for examination. Claims 56-82 are pending in the letter.

Double Patenting

1. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

2. Claims 56-82 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 56-126 of copending Application No. 09/524,095. Although the conflicting claims are not identical, they are not patentably distinct. It would have been obvious to one of ordinary skill in the art to observed that the omission of the limitations "***soliciting additional input from the user, including user interaction in a modality different that the original request and, refining the navigation query, based upon the additional input***", of applicant claims 56-82 are already in the Co-pending application 09/524,095, as such they are obvious variation of the inventive concept defined in claims 56-126 of the Co-pending application 09/524,095. See In re Karlson, 136USPQ 184 (CCPA 1963). This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

4. Claims 56-82 are rejected under 35 U.S.C. 102(e) as being anticipated by Levin et al. (U.S. Patent No. 6,173,279).

5. As per claim 56, Levin et al teach a method for speech-based navigation (information server, 110) of an electronic data source located at one or more network servers located remotely from a user, wherein at least a portion of a data link between a mobile information appliance of the user and the one or more network servers utilizes wireless communication (see abstract, fig 1, column 3 lines 5-35), comprising receiving a spoken request (*receive a natural language query*) for desired information from the user (user) utilizing the mobile information appliance (PC, 102) of the user; rendering an interpretation (*creating a semantic representation*) of the spoken request, constructing a navigation (*generating search*) query based upon the interpretation; utilizing the navigation query to select a portion of the electronic data source; and transmitting the selected portion of the electronic data source from the network server to the mobile information appliance of the user. (see abstract, fig 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22)

6. As per claim 57, 58, 62-64, Levin et al teach a method of rendering the interpretation of the spoken request is performed at the one or more network servers by the mobile information appliance including a wireless telephone, a portable computer that is a personal digital assistance (see abstract, fig 1, column 3 lines 5-35).

7. As per claim 59, Levin et al teach a method of soliciting additional input from the user, including user interaction in a modality different than the original request; refining the navigation query, based upon the additional input; and using the refined navigation query to select a portion of the electronic data source (see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22).

8. As per claim 60, Levin et al teach a method wherein the data link includes a cellular telephone system (see fig 1, column 2 line 61-67).

9. As per claim 61, Levin et al teach a method wherein steps (a)-(d) are performed with respect to multiple users (see abstract, fig 1, column 3 lines 5-35).

10. As per claim 65, Levin et al teach a computer system for speech-based navigation (information server, 110) of an electronic data source located at one or more network servers located remotely from a user, wherein at least a portion of a data link between a mobile information appliance of the user and the one or more network servers utilizes wireless communication (see abstract, fig 1, column 3 lines 5-35), comprising a code segment receiving a

spoken request (*receive a natural language query*) for desired information from the user (user) utilizing the mobile information appliance (PC, 102) of the user; a code segment rendering an interpretation (*creating a semantic representation*) of the spoken request, a code segment constructing a navigation (*generating search)* query based upon the interpretation; a code segment utilizing the navigation query to select a portion of the electronic data source; and a code segment transmitting the selected portion of the electronic data source from the network server to the mobile information appliance of the user. (see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22)

11. As per claim 66, 67, 71-73, Levin et al teach a system of rendering the interpretation of the spoken request is performed at the one or more network servers by the mobile information appliance including a wireless telephone, a portable computer that is a personal digital assistance (see abstract, fig 1, column 3 lines 5-35).

12. As per claim 68, Levin et al teach a system of soliciting additional input from the user, including user interaction in a modality different than the original request; refining the navigation query, based upon the additional input; and using the refined navigation query to select a portion of the electronic data source (see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22).

13. As per claim 69, Levin et al teach a system wherein the data link includes a cellular telephone system (see fig 1, column 2 line 61-67).

14. As per claim 70, Levin et al teach a system wherein steps (a)-(d) are performed with respect to multiple users (see abstract, fig 1, column 3 lines 5-35).

15. As per claim 74, Levin et al teach a system for speech-based navigation (information server, 110) of an electronic data source located at one or more network servers located remotely from a user, wherein at least a portion of a data link between a mobile information appliance of the user and the one or more network servers utilizes wireless communication (see abstract, fig 1, column 3 lines 5-35), comprising receiving a spoken request (*receive a natural language query*) for desired information from the user (user) utilizing the mobile information appliance (PC, 102) of the user; rendering an interpretation (*creating a semantic representation*) of the spoken request, constructing a navigation (*generating search)* query based upon the interpretation; utilizing the navigation query to select a portion of the electronic data source; and transmitting the selected portion of the electronic data source from the network server to the mobile information appliance of the user. (see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22)

16. As per claim 75, 76, 80-81, Levin et al teach a method of rendering the interpretation of the spoken request is performed at the one or more network servers by the mobile information appliance including a wireless telephone, a portable computer that is a personal digital assistance (see abstract, fig 1, column 3 lines 5-35).

17. As per claim 77, Levin et al teach a system of soliciting additional input from the user, including user interaction in a modality different than the original request; refining the

navigation query, based upon the additional input; and using the refined navigation query to select a portion of the electronic data source (see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22).

18. As per claim 78, Levin et al teach a system wherein the data link includes a cellular telephone system (see fig 1, column 2 line 61-67).

19. As per claim 79, Levin et al teach a system wherein steps (a)-(d) are performed with respect to multiple users (see abstract, fig 1, column 3 lines 5-35).

Conclusion

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. (6,192,338).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Firmin Backer whose telephone number is 703-305-0624. The examiner can normally be reached on Mon-Thu 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sheikh Ayaz can be reached on 703-305-9648. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3718 for regular communications and 703-305-5352 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Firmin Backer
April 9, 2001

AYAZ SHEIKH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

FORM PTO-892 U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	SERIAL NO.	GROUP ART UNIT	ATTACHMENT TO PAPER NO.
NOTICE OF REFERENCES CITED	09/608,872	2155 ~~2781~~	10
	APPLICANT(S) HALVERSEN ET AL.		

U.S. PATENT DOCUMENTS

*		DOCUMENT NO.	DATE	NAME	CLASS	SUB-CLASS	FILING DATE
	A	6,192,338	2/2001	Haszto et al	704	257	
	B	6,173,279	1/2001	Levin et al.	707	5	
	C						
	D						
	E						
	F						
	G						
	H						
	I						
	J						
	K						

FOREIGN PATENT DOCUMENTS

*		DOCUMENT NO.	DATE	COUNTRY	NAME	CLASS	SUB-CLASS
	L						
	M						
	N						
	O						
	P						
	Q						

OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, Etc.)

R	
S	
T	
U	

EXAMINER	DATE	
Firmin Backer	April 9, 2001	Form892ccs2106b

* A copy of this reference is not being furnished with this office action.
(See Manual of Patent Examining Procedure, section 707.05(a).)

Attachment for PTO-948 (Rev. 03/01, or earlier)
6/18/01

The below text replaces the pre-printed text under the heading, "Information on How to Effect Drawing Changes," on the back of the PTO-948 (Rev. 03/01, or earlier) form.

INFORMATION ON HOW TO EFFECT DRAWING CHANGES

1. Correction of Informalities -- 37 CFR 1.85

New corrected drawings must be filed with the changes incorporated therein. Identifying indicia, if provided, should include the title of the invention, inventor's name, and application number, or docket number (if any) if an application number has not been assigned to the application. If this information is provided, it must be placed on the front of each sheet and centered within the top margin. If corrected drawings are required in a Notice of Allowability (PTOL-37), the new drawings **MUST** be filed within the **THREE MONTH** shortened statutory period set for reply in the Notice of Allowability. Extensions of time may NOT be obtained under the provisions of 37 CFR 1.136(a) or (b) for filing the corrected drawings after the mailing of a Notice of Allowability. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

2. Corrections other than Informalities Noted by Draftsperson on form PTO-948.

All changes to the drawings, other than informalities noted by the Draftsperson, **MUST** be made in the same manner as above except that, normally, a highlighted (preferably red ink) sketch of the changes to be incorporated into the new drawings **MUST** be approved by the examiner before the application will be allowed. No changes will be permitted to be made, other than correction of informalities, unless the examiner has approved the proposed changes.

Timing of Corrections

Applicant is required to submit the drawing corrections <u>within the time period set in the attached Office communication</u>. See 37 CFR 1.85(a).

Failure to take corrective action within the set period will result in ABANDONMENT of the application.

06/01/01

OIPE JC170
APR 3 0 2001
PATENT & TRADEMARK OFFICE

2155

PATENT

#7
LDS
5-8-01

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of:	
Halverson et al.	Group Art Unit: 2741
	Examiner: Unassigned
Application No. 09/608,872	
	Atty. Docket No. SRI1P037B/ 44454/03450
Filed: 06/30/2000	
For: MOBILE NAVIGATION OF NETWORK -BASED ELECTRONIC INFORMATION USING SPOKEN INPUT	Date: April 27, 2001

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MAY 4 - 2001
Technology Center 2100

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, DC 20231 on April 27, 2001.

Signed: Erica L. Mann
Erica L. Mann

INFORMATION DISCLOSURE STATEMENT
UNDER 37 CFR §§ 1.56 AND 1.97(c)

Assistant Commissioner for Patents
Washington, DC 20231

Dear Sir:

The references listed in the attached PTO Form 1449, copies of which are attached, may be material to examination of the above-identified patent application. Applicants submit these references in compliance with their duty of disclosure pursuant to 37 CFR §§ 1.56 and 1.97. The Examiner is requested to make these references of official record in this application.

This Information Disclosure Statement is not to be construed as a representation that a search has been made, that additional information material to the examination of this application does not exist, or that these references indeed constitute prior art.

This Information Disclosure Statement is believed to be filed before the mailing date of a first Office Action on the merits. Accordingly, it is believed that no fees are due in connection with the filing of this Information Disclosure Statement. However, if it is determined that any fees are due, the Commissioner is hereby authorized to charge such fees to Deposit Account 03-0683 (Order No. 44454/03450/SRI1P037B).

Respectfully submitted,
CARLTON FIELDS

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MAY 4 - 2001
Technology Center 2100

Dominic M. Kotab
Reg. No. 42,762

P.O. Box 721030
San Jose, CA 95172-1030
Telephone: (408) 271-2300

#7

Form 1449 (Modified) **Information Disclosure Statement By Applicant** (Use Several Sheets if Necessary)	Atty: Docket No. SRI1P037B Applicant: Halverson et al. Filing Date: 06/30/2000	Application No.: 09/608,872 Group Art Unit: ~~2741~~ 2155

OIPE APR 3 0 2001 PATENT & TRADEMARK OFFICE

U.S. Patent Documents

Examiner Initial	No.	Patent No.	Date	Patentee	Class	Sub-class	Filing Date
KU	A	6,026,388	02/15/00	Liddy et al.	707	1	08/14/96
	B	6,102,030	01/04/00	French- St. George et al.	704	275	04/21/98
	C	6,003,072	12/14/99	Gerritsen et al.	709	218	06/30/94
	D	5,890,123	03/30/99	Brown et al.	704	275	06/05/95
	E	5,855,002	12/29/98	Armstrong	704	270	06/11/96
	F	5,963,940	10/05/99	Liddy et al.	707	5	08/14/96
	G	5,805,775	09/08/98	Eberman et al.	395	12	02/02/96
	H	5,802,526	09/01/98	Fawcett et al.	707	10	04/18/96
	I	5,794,050	08/11/98	Dahlgren et al.	395	708	10/20/97
	J	5,774,859	06/30/98	Houser et al.	704	275	01/03/95
KU	K	5,748,974	05/05/98	Johnson	395	759	12/13/94

RECEIVED MAY 2001 Technology Center 2100

Foreign Patent or Published Foreign Patent Application

Examiner Initial	No.	Document No.	Publication Date	Country or Patent Office	Class	Sub-class	Translation Yes	Translation No
	L							
	M							
	N							
	O							
	P							

Other Documents

Examiner Initial	No.	Author, Title, Date, Place (e.g. Journal) of Publication
KU	R	Stent, Amanda et al., "The CommandTalk Spoken Dialogue System", SRI International
KU	S	Moore, Robert et al., "CommandTalk: A Spoken-Language Interface for Battlefield Simulations", October 23, 1997, SRI International
KU	T	Dowding, John et al., "Interpreting Language in Context in CommandTalk", February 5, 1999, SRI International

Examiner	[signature]	Date Considered	9/27/02

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

#7

Form 1449 (Modified) **Information Disclosure Statement By Applicant** (Use Several Sheets if Necessary)	Atty. Docket No. SRI1P037B Applicant: Halverson et al. Filing Date: 06/30/2000	Application No.: 09/608,872 Group Art Unit: ~~2741~~ 2155

OIPE APR 3 0 2001 PATENT & TRADEMARK OFFICE

U.S. Patent Documents

Examiner Initial	No.	Patent No.	Date	Patentee	Class	Sub-class	Filing Date
[illegible]	A	5,729,659	03/17/98	Potter	395	2.79	06/06/95
	B	5,721,938	02/24/98	Stuckey	395	754	06/07/95
	C	5,608,624	03/04/97	Luciw	395	794	05/15/95
	D	5,519,608	05/21/96	Kupiec	364	419.08	06/24/93
	E	5,434,777	07/18/95	Luciw	364	419.13	03/18/94
	F	5,386,556	01/31/95	Hedin et al.	395	600	[illegible]/23/92
[illegible]	G	5,197,005	03/23/93	Shwartz et al.	364	419	05/01/89
	H						
	I						
	J						
	K						

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Foreign Patent or Published Foreign Patent Application

Examiner Initial	No.	Document No.	Publication Date	Country or Patent Office	Class	Sub-class	Translation Yes	Translation No
	L							
	M							
	N							
	O							
	P							

Other Documents

Examiner Initial	No.	Author, Title, Date, Place (e.g. Journal) of Publication
[illegible]	R	http://www.ai.sri.com/~oaa/infowiz.html, "InfoWiz: An Animated Voice Interactive Information System, May 8, 2000.
[illegible]	S	Dowding, John, "Interleaving Syntax and Semantics in an Efficient Bottom-up Parser", SRI International
[illegible]	T	Moore, Robert et al., "Combining Linguistic and Statistical Knowledge Sources in Natural-Language Processing for ATIS", SRI International

Examiner [signature]	Date Considered 9/27/02

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

#7

Form 1449 (Modified) **Information Disclosure Statement By Applicant** (Use Several Sheets if Necessary)	Atty. Docket No. SRI1P037B Applicant: Halverson et al. Filing Date: 06/30/2000	Application No.: 09/608,872 Group Art Unit: ~~2741~~ 2155

OIPE JC170 APR 3 0 2001 PATENT & TRADEMARK OFFICE

U.S. Patent Documents

Examiner Initial	No.	Patent No.	Date	Patentee	Class	Sub-class	Filing Date
	A						
	B						
	C						
	D						
	E						
	F						
	G						
	H						
	I						
	J						
	K						

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Foreign Patent or Published Foreign Patent Application

Examiner Initial	No.	Document No.	Publication Date	Country or Patent Office	Class	Sub-class	Translation Yes	Translation No
	L							
	M							
	N							
	O							
	P							

Other Documents

Examiner Initial	No.	Author, Title, Date, Place (e.g. Journal) of Publication
TG	R	Dowding, John et al., "Gemini: A Natural Language System For Spoken-Language Understanding", SRI International
	S	
	T	

Examiner	[signature]	Date Considered	9/27/02

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

OIPE JC157
MAY 14 2001
PATENT & TRADEMARK OFFICE

#9

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.: 09/608,872
INVENTOR: Halverson, Christine
TITLE: MOBILE NAVIGATION OF NETWORK-BASED ELECTRONIC INFORMATIONUSING SPOKEN INPUT

FILING DATE: 6/30/00
ATTORNEY DOCKET NO. SRI1P037B

RECEIVED
MAY 17 2001
Technology Center 2100

NOTICE OF CHANGE OF CORRESPONDENCE ADDRESS

Assistant Commissioner for Patents
Washington, DC 20231

Sir:

Please change the correspondence address relating to the above-identified application as follows:

C. Douglas McDonald , Esq.
Carlton Fields, et al.
P.O. Box 3239
Tampa, FL 33601-3239

Respectfully submitted,

C. Douglas McDonald

Date: May 10, 2001

C. Douglas McDonald
Reg. No. 26,659
CARLTON FIELDS, P.A.
P.O. Box 3239
Tampa, FL 33601-3239
(813) 223-7000
Attorney of Record

TPA#1524975.01

4B17 GAU-2155 #8

Attorney Docket No.: SRI1P037B

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF: HALVERSON, CHRISTINE
SERIAL NO.: 09/608,872
FILED: 6/30/00
TITLE: MOBILE NAVIGATION OF NETWORK-BASED ELECTRONIC INFORMATIONUSING SPOKEN INPUT

ASSOCIATE POWER OF ATTORNEY

Assistant Commissioner for Patents
Washington, DC 20231

Dear Sir:

I hereby appoint: C. Douglas McDonald (Reg. No. 26,659)

whose post office address is

Carlton Fields, P.A.
P. O. Box 3239
Tampa, Florida 33601-3239

as my associate attorney in the above-entitled application, to prosecute this application, to make alterations and amendments therein, and to transact all business in the Patent and Trademark Office connected therewith.

Please continue to address all future communications to:

Carlton Fields, LLP
P. O. Box 721030
San Jose, CA 95172-1030

Respectfully submitted

Date: MAY 1 2001

Kevin J. Zilka (Reg. No. 41,429)
Dominic Kotab (Reg. No. 42,762)
Carlton Fields LLP
P.O. Box 721030
San Jose, CA 95172-1030
Telephone: (408) 271-2300
Fax: (408) 275-9579

TPA#1680358.01

File History Content Report

The following content is missing from the original file history record obtained from the United States Patent and Trademark Office. No additional information is available.

Document Date - 2001-05-21

Document Title - USPTO Communication Re: Change of Address

GAU 2155

PTO/SB/21 (08-00)

Please type a plus sign (+) inside this box ⟶ [+]

Approved for use through 10/31/2002. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
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OIPE SEP 2 1 2001 PATENT & TRADEMARK OFFICE

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	09/608,872
Filing Date	June 30, 2000
First Named Inventor	HALVERSON
Group Art Unit	2155
Examiner Name	F. BACKER
Attorney Docket Number	SRI 1 P 037B
Total Number of Pages in This Submission	

ENCLOSURES *(check all that apply)*

- [x] Fee Transmittal Form
  - [x] Fee Attached
- [x] Amendment / Response
  - [ ] After Final
  - [ ] Affidavits/declaration(s)
- [x] Extension of Time Request
- [ ] Express Abandonment Request
- [ ] Information Disclosure Statement
- [ ] Certified Copy of Priority Document(s)
- [ ] Response to Missing Parts/ Incomplete Application
  - [ ] Response to Missing Parts under 37 CFR 1.52 or 1.53
- [ ] Assignment Papers *(for an Application)*
- [ ] Drawing(s)
- [ ] Licensing-related Papers
- [ ] Petition
- [ ] Petition to Convert to a Provisional Application
- [x] Power of Attorney, Revocation Change of Correspondence Address
- [ ] Terminal Disclaimer
- [ ] Request for Refund
- [ ] CD, Number of CD(s)
- [ ] After Allowance Communication to Group
- [ ] Appeal Communication to Board of Appeals and Interferences
- [ ] Appeal Communication to Group *(Appeal Notice, Brief, Reply Brief)*
- [ ] Proprietary Information
- [ ] Status Letter
- [ ] Other Enclosure(s) *(please identify below)*:

Remarks

RECEIVED SEP 2 6 2001 Technology Center 2100

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	KIN-WAH TONG
Signature	[signature]
Date	September 19, 2001

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on this date: September 19, 2001

Typed or printed name	Linda DeNardi		
Signature	Linda DeNardi	Date	September 19, 2001

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be send to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

PTO/SB/21 (08-00)

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Approved for use through 10/31/2002. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

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OIPE JC95 SEP 2 1 2001 PATENT & TRADEMARK OFFICE

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	09/608,872
Filing Date	June 30, 2000
First Named Inventor	HALVERSON
Group Art Unit	2155
Examiner Name	F. BACKER
Attorney Docket Number	SRI 1 P 037B

Total Number of Pages in This Submission

ENCLOSURES *(check all that apply)*

- [x] Fee Transmittal Form
  - [x] Fee Attached
- [x] Amendment / Response
  - [ ] After Final
  - [ ] Affidavits/declaration(s)
- [x] Extension of Time Request
- [ ] Express Abandonment Request
- [ ] Information Disclosure Statement
- [ ] Certified Copy of Priority Document(s)
- [ ] Response to Missing Parts/ Incomplete Application
  - [ ] Response to Missing Parts under 37 CFR 1.52 or 1.53
- [ ] Assignment Papers *(for an Application)*
- [ ] Drawing(s)
- [ ] Licensing-related Papers
- [ ] Petition
- [ ] Petition to Convert to a Provisional Application
- [x] Power of Attorney, Revocation Change of Correspondence Address
- [ ] Terminal Disclaimer
- [ ] Request for Refund
- [ ] CD, Number of CD(s)
- [ ] After Allowance Communication to Group
- [ ] Appeal Communication to Board of Appeals and Interferences
- [ ] Appeal Communication to Group *(Appeal Notice, Brief, Reply Brief)*
- [ ] Proprietary Information
- [ ] Status Letter
- [ ] Other Enclosure(s) *(please identify below)*:

Remarks

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SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	KIN-WAH TONG
Signature	K-W Tong
Date	September 19, 2001

CERTIFICATE OF MAILING

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Typed or printed name	Linda DeNardi		
Signature	Linda DeNardi	Date	September 19, 2001

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be send to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

OIPE
SEP 2 1 2001
PATENT & TRADEMARK OFFICE

FEE TRANSMITTAL for FY 2001

Patent fees are subject to annual revision.

DURING PENDENCY, PLEASE CHARGE DEPOSIT ACCOUNT 20-0782 FOR ANY 37 C.F.R. 1.16 AND/OR 37 C.F.R. 1.17 FEES DUE AND NOT OTHERWISE AUTHORIZED. PLEASE CREDIT DEPOSIT ACCOUNT 20-0782 FOR ANY OVERPAYMENTS

TOTAL AMOUNT OF PAYMENT ($) 195.00

Complete if Known	
Application Number	09/608,872
Filing Date	June 30, 2000
First Named Inventor	HALVERSON
Examiner Name	F. BACKER
Group / Art Unit	2155
Attorney Docket No.	SRI 1P037B

RECEIVED SEP 26 2001 Technology Center 2100

METHOD OF PAYMENT (check one)

1. ☒ The Commissioner is hereby authorized to charge indicated fees and credit any over payments to:

Deposit Account Number: 20-0782

Deposit Account Name:

☒ Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17

☒ Applicant claims small entity status. See 37 CFR 1.27

2. ☒ Payment Enclosed:

☒ Check ☐ Credit card ☐ Money Order ☐ Other

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
101	710	201	355	Utility filing fee	
106	320	206	160	Design filing fee	
107	490	207	245	Plant filing fee	
108	710	208	355	Reissue filing fee	
114	150	214	75	Provisional filing fee	

SUBTOTAL (1) ($) 0

2. EXTRA CLAIM FEES

			Extra Claims		Fee from below		Fee Paid
Total Claims		-20** =	0	X		=	0
Independent Claims		-3** =	0	X		=	0
Multiple Dependent				X		=	0

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description
103	18	203	9	Claims in excess of 20
102	80	202	40	Independent claims in excess of 3
104	270	204	135	Multiple dependent claim, if not paid
109	80	209	40	** Reissue independent claims over original patent
110	18	210	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) ($) 0

**or number previously paid, if greater; For Reissues, see above

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
105	130	205	65	Surcharge - late filing fee or oath	
127	50	227	25	Surcharge - late provisional filing fee or cover sheet.	
139	130	139	130	Non-English specification	
147	2,520	147	2,520	For filing a request for reexamination	
112	920*	112	920*	Requesting publication of SIR prior to Examiner action	
113	1,840*	113	1,840*	Requesting publication of SIR after Examiner action	
115	110	215	55	Extension for reply within first month	
116	390	216	195	Extension for reply within second month	195.00
117	890	217	445	Extension for reply within third month	
118	1,390	218	695	Extension for reply within fourth month	
128	1,890	228	945	Extension for reply within fifth month	
119	310	219	155	Notice of Appeal	
120	310	220	155	Filing a brief in support of an appeal	
121	270	221	135	Request for oral hearing	
138	1,510	138	1,510	Petition to institute a public use proceeding	
140	110	240	55	Petition to revive – unavoidable	
141	1,240	241	620	Petition to revive – unintentional	
142	1,240	242	620	Utility issue fee (or reissue)	
143	440	243	220	Design issue fee	
144	600	244	300	Plant issue fee	
122	130	122	130	Petitions to the Commissioner	
123	130	123	130	Petitions related to provisional applications	
126	180	126	180	Submission of Information Disclosure Stmt	
581	40	581	40	Recording each patent assignment per property (times number of properties)	
146	710	246	355	Filing a submission after final rejection (37 CFR § 1.129(a))	
149	710	249	355	For each additional invention to be examined (37 CFR § 1.129(b))	
179	710	279	355	Request for Continued Examination (RCE)	
169	900	169	900	Request for expedited examination of a design application	

Other fee (specify)

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) ($) 195.00

SUBMITTED BY				Complete *(if applicable)*	
Name (Print/Type)	KIN-WAH TONG	*Registration No. Attorney/Agent)*	39,400	*Telephone*	(732) 530-9404
Signature	K. W. Tong			*Date*	SEPTEMBER 19, 2001

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FEE TRANSMITTAL for FY 2001

Patent fees are subject to annual revision.

DURING PENDENCY, PLEASE CHARGE DEPOSIT ACCOUNT 20-0782 FOR ANY 37 C.F.R. 1.16 AND/OR 37 C.F.R. 1.17 FEES DUE AND NOT OTHERWISE AUTHORIZED. PLEASE CREDIT DEPOSIT ACCOUNT 20-0782 FOR ANY OVERPAYMENTS

TOTAL AMOUNT OF PAYMENT ($) 195.00

Complete If Known	
Application Number	09/608,872
Filing Date	June 30, 2000
First Named Inventor	HALVERSON
Examiner Name	F. BACKER
Group / Art Unit	2155
Attorney Docket No.	SRI 1P037B

OIPE SEP 21 2001 PATENT & TRADEMARK OFFICE

METHOD OF PAYMENT (check one)

1. ☒ The Commissioner is hereby authorized to charge indicated fees and credit any over payments to:

Deposit Account Number: 20-0782

Deposit Account Name:

☒ Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17

☒ Applicant claims small entity status. See 37 CFR 1.27

2. ☒ Payment Enclosed:

☒ Check ☐ Credit card ☐ Money Order ☐ Other

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
101	710	201	355	Utility filing fee	
106	320	206	160	Design filing fee	
107	490	207	245	Plant filing fee	
108	710	208	355	Reissue filing fee	
114	150	214	75	Provisional filing fee	

SUBTOTAL (1) ($) 0

2. EXTRA CLAIM FEES

			Extra Claims		Fee from below		Fee Paid
Total Claims		-20** =	0	X		=	0
Independent Claims		-3** =	0	X		=	0
Multiple Dependent				X		=	0

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description
103	18	203	9	Claims in excess of 20
102	80	202	40	Independent claims in excess of 3
104	270	204	135	Multiple dependent claim, if not paid
109	80	209	40	** Reissue independent claims over original patent
110	18	210	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) ($) 0

**or number previously paid, if greater; For Reissues, see above

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
105	130	205	65	Surcharge - late filing fee or oath	
127	50	227	25	Surcharge - late provisional filing fee or cover sheet.	
139	130	139	130	Non-English specification	
147	2,520	147	2,520	For filing a request for reexamination	
112	920*	112	920*	Requesting publication of SIR prior to Examiner action	
113	1,840*	113	1,840*	Requesting publication of SIR after Examiner action	
115	110	215	55	Extension for reply within first month	
116	390	216	195	Extension for reply within second month	195.00
117	890	217	445	Extension for reply within third month	
118	1,390	218	695	Extension for reply within fourth month	
128	1,890	228	945	Extension for reply within fifth month	
119	310	219	155	Notice of Appeal	
120	310	220	155	Filing a brief in support of an appeal	
121	270	221	135	Request for oral hearing	
138	1,510	138	1,510	Petition to institute a public use proceeding	
140	110	240	55	Petition to revive – unavoidable	
141	1,240	241	620	Petition to revive – unintentional	
142	1,240	242	620	Utility issue fee (or reissue)	
143	440	243	220	Design issue fee	
144	600	244	300	Plant issue fee	
122	130	122	130	Petitions to the Commissioner	
123	130	123	130	Petitions related to provisional applications	
126	180	126	180	Submission of Information Disclosure Stmt	
581	40	581	40	Recording each patent assignment per property (times number of properties)	
146	710	246	355	Filing a submission after final rejection (37 CFR § 1.129(a))	
149	710	249	355	For each additional invention to be examined (37 CFR § 1.129(b))	
179	710	279	355	Request for Continued Examination (RCE)	
169	900	169	900	Request for expedited examination of a design application	

Other fee (specify)

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) ($) 195.00

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SUBMITTED BY		Complete *(if applicable)*			
Name (Print/Type)	KIN-WAH TONG	*Registration No. Attorney/Agent)*	39,400	*Telephone*	(732) 530-9404
Signature	K. Wah Tong			*Date*	SEPTEMBER 19, 2001

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09/608,872

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#12
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10-01-01

IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE

PATENT APPLICATION

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Applicant: **Halverson et al.**

Case: **SRI1P037B**

Serial No.: **09/608,872** Filed: **June 30, 2000**

Group Art Unit: **2155**

Examiner: **Firmin Backer**

Title: **MOBILE NAVIGATION OF NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN INPUT**

ASSISTANT COMMISSIONER FOR PATENTS
Box Non-Fee Amendment
Washington, D. C. 20231

S I R:

RESPONSE UNDER 37 C.F.R. § 1.111

This response addresses the Office Action dated April 24, 2001 (Paper No. 10).

REMARKS

In view of the following discussion, the Applicants submit that none of the claims now pending in the application are anticipated under the provisions of 35 U.S.C. § 102. Thus, the Applicants believe that all of these claims are now in allowable form.

I. REJECTION OF CLAIMS 56-82 UNDER DOUBLE PATENTING

The Examiner provisionally rejected claims 56-82 in Paragraphs 1-2 of the Office Action based on statutory type double patenting under 35 U.S.C. § 101 as claiming the same invention as that of claims 56-126 of copending Application No. 09/524,095. Applicants respectfully traverse the rejection.

First, the Examiner noted that "it would have been obvious to one of ordinary skill in the art to observe that the omission of the limitations '**soliciting additional input**

from the user, including user interaction in a modality different tha[n] the original request and, refining the navigation query, based upon the additional input'. After noting the differences between the scope of the claims between the two applications, the Examiner then concluded that claims 56-82 "are obvious variation of the inventive concept defined in claims 56-126 of co-pending application 09/524,095".

Applicants direct the Examiner's attention to the fact that there are two types of double patenting rejections: "statutory" and "non-statutory (obviousness-type)". MPEP 804 states that "[i]n determining whether a statutory basis for a double patenting rejection exists, the question to be asked is: Is the same invention being claimed twice?" "A reliable test for double patenting under 35 U.S.C. 101 is whether a claim in the application could be literally infringed without literally infringing a corresponding claim in the patent". Given the substantial differences between the claims of the two applications as noted by the Examiner, Applicants respectfully submit that applying the statutory double patenting test as promoted in the MPEP would not produce a statutory double patenting rejection in the present application. As such, Applicants submit that the present statutory double patenting rejection against claims 56-82 is inappropriate.

Second, it should be noted that the present application is a continuation of the co-pending application 09/524,095. As such, if and when these two applications mature into issued patents, both patents will have the same term. Thus, given the differences between the scope of the claims of both applications and the fact that both applications will expire at the same time (if issued), Applicants respectfully submit that statutory double patenting rejection against claims 56-82 is inappropriate.

II. REJECTION OF CLAIMS 56-82 UNDER 35 U.S.C. § 102

The Examiner has rejected claims 56-82 in Paragraphs 4-19 of the Office Action as being anticipated by the Levin et al. patent (US Patent 6,173,279 issued January 9, 2001, hereinafter referred to as Levin). The rejection is respectfully traversed.

Levin teaches "a method of using at least one natural language query to retrieve information from one or more data resources and further performing a requested action using the retrieved information is disclosed". (See Levin, Column 2, lines 15-18)

Namely, Levin teaches a method for using natural language query to obtain information, where upon receipt of the requested information, a desired action is executed based upon the requested information. To illustrate, Levin provides the example, where a user employs natural language to request the telephone number of a restaurant. Upon receipt of the telephone number, the telephone number is actually dialed for the user. (See Levin, Column 3 line 62 to Column 4, line 1)

In contrast, Levin fails to teach or suggest the novel concept of speech-based navigation where the method receives spoken request for desired information from the user utilizing the mobile information appliance of the user and where, in turn, the selected electronic data source from the network server is transmitted to the mobile information appliance of the user. Specifically, Applicants' independent claims 56, 65 and 74 positively recite:

> 56. A method for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, wherein at least a portion of a data link between a mobile information appliance of the user and the one or more network servers utilize wireless communication, comprising the steps of:
> (a) receiving a spoken request for desired information from the user utilizing the mobile information appliance of the user;
> (b) rendering an interpretation of the spoken request;
> (c) constructing a navigation query based upon the interpretation;
> (d)utilizing the navigation query to select a portion of the electronic data source; and
> (e) transmitting the selected portion of the electronic data source from the network server to the mobile information appliance of the user. (emphasis added)
>
> 65. A computer program embodied on a computer readable medium for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, wherein at least a portion of a data link between a mobile information appliance of the user and the one or more network servers utilizes wireless communication, comprising:
> (a) a code segment that receives a spoken request for desired information from the user utilizing the mobile information appliance of the user;
> (b) a code segment that renders an interpretation of the spoken request.
> (c) a code segment that constructs a navigation query based upon the

interpretation;
(d) a code segment that utilizes the navigation query to select a portion of the electronic data source; and
(e) a code segment that transmits the selected portion of the electronic data source from the network server to the mobile information appliance of the user. (emphasis added)

74. A system for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, comprising:
(a) a mobile information appliance operable to receive a spoken request for desired information from the user;
(b) spoken language processing logic, operable to render an interpretation of the spoken request;
(c) query construction logic, operable to construct a navigation query based upon the interpretation;
(d) navigation logic, operable to select a portion of the electronic data source using the navigation query, and
(e) electronic communications infrastructure for transmitting the selected portion of the electronic data source from the network server to the mobile information appliance of the user, wherein at least a portion of a data link of the electronic communications infrastructure between a mobile information appliance of the user and the one or more network servers utilizes wireless communication. (emphasis added)

Applicants' invention teaches a novel method and apparatus for speech-based navigation where the method receives spoken request for desired information from the user utilizing the **mobile information appliance** of the user and where, in turn, the selected electronic data source from the network server is **transmitted to the mobile information appliance** of the user. Specifically, Applicants address the criticality of providing speech-based navigation via a mobile, i.e., wireless communication, approach in addition to spoken natural language. It has been noted that with the proliferation of various mobile appliances, it would be advantageous to allow these mobile appliances to access the same vastness of electronic data sources that are available to hard-wired appliances like a desktop computer. However, the very essence of a mobile appliance is its portability, small size and ease of use. As such, unlike hard-wired appliances, mobile appliances are not equipped with large bulky input devices. In fact, even if the mobile appliance is equipped with extensive input devices, most users would still find these "shrunken" input devices to be cumbersome and difficult to use, e.g., an electronic representation of a keyboard on a PDA and the like.

To further exacerbate the problem, obtaining information from an electronic data source may require extensive and complex interaction between the user's mobile appliance and the system holding the electronic data source. Thus, the limited or cumbersome input/output capability of a mobile appliance presents a substantial barrier to its ability to access a data resource that requires extensive and complex interaction.

To address this criticality, Applicants disclose a speech-based navigation method that is deployed in conjunction with mobile appliances. To illustrate, the user can request via a mobile appliance, e.g., a cellular telephone, all the names of a particular ethnic restaurant on a particular street. Clearly, this request is rather complex given the limited input capability (generally a numeric keypad) of a cellular phone. Without additional input devices, this complex request may require numerous interactions between the user and a remote data resource, e.g., long repeated sequences of presenting a menu, scrolling within the menu and selecting the desired information within the menu and so on for the next menu and beyond. Such tedium discourages a user from attempting to acquire complex information via mobile appliances.

In contrast, Applicants' invention allows the complex request to be received as a spoken request directly via the user's mobile information appliance, thereby substantially reducing the amount of interaction of the user with the remote data resource. The present method will interpret and construct a navigation query that is utilized to obtain the selected data. For example, if the navigation query produces three possible results, then the results can be simply transmitted to the user via a menu on the screen of the mobile appliance.

In contrast, Levin teaches that "[u]sing a personal computer (PC) 102, a user establishes a connection with packet network 108 via an access server 106". Levin then states that "[t]he user may also use a telephone 103 to connect to the packet network 108" and that "[t]ypically <u>a modem connection</u> (not shown) may be used to connect the PC 102 to the packet 108 <u>in a conventional manner</u>". (emphasis added) (See Levin, Column 3, lines 5-10). Additionally, Levin states that "[t]he PC 102 dials into an access server 106 that is connected to the Internet or other database service via a logical network interface (not shown)" and that "[t]he logical network interface may be a local area network (LAN), a Serial Line Internet Protocol (SLIP) connection over a modem, an ISDN port or via a connection to a special LAN such as an ATM LAN or a LAN that offers bandwidth reservation". (See Levin, Column 4, lines 23-29) It is respectfully submitted that none of Levin's statements provides any specific teaching as to mobile appliances or wireless communication. In fact, terms such as "modem connection" and "ISDN port" are typically associated with hard-wired appliances. Thus, Levin does not teach or disclose a <u>method that receives spoken request for desired information from the user utilizing the mobile information appliance of the user and where, in turn, the selected electronic data source from the network server is transmitted to the mobile information appliance of the user</u>. Namely, the scope of Applicants' claims is specifically directed to speech-based navigation via mobile information appliances. This novel concept is not disclosed by the Levin reference and Applicants' claims would not read on the Levin reference.

Therefore, the Applicants respectfully submit that independent claims 56, 65 and 74 are not anticipated by the Levin reference. As such, claims 56, 65 and 74 fully satisfy the requirements of 35 U.S.C. §102 and are patentable thereunder.

Claims 57-64, 66-73 and 75-82 depend, either directly or indirectly, from claims 56, 65 and 74 and recite additional features therefor. Since Levin fails to anticipate Applicants' invention as recited in Applicants' independent claims 56, 65 and 74, dependent claims 57-64, 66-73 and 75-82 are also not anticipated under 35 U.S.C. § 102 and are allowable for the same reason noted above.

<u>Conclusion</u>

Thus, the Applicants submit that all of these claims now fully satisfy the requirements of 35 U.S.C. §102. Consequently, the Applicants believe that all these claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

09/608,872

If, however, the Examiner believes that there are any unresolved issues requiring the issuance of a final action in any of the claims now pending in the application, it is requested that the Examiner telephone Mr. Kin-Wah Tong, Esq. at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

9/19/01

Kin-Wah Tong, Attorney
Reg. No. 39,400
(732) 530-9404

Moser, Patterson & Sheridan, LLP
595 Shrewsbury Avenue
First Floor,
Shrewsbury, New Jersey 07702

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PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)	Docket Number (Optional) SRI 1P037B

#10
LDJ
10-01-01

OIPE JC95
SEP 2 1 2001
PATENT & TRADEMARK OFFICE

In re Application of HALVERSON, et al	
Application Number 09/608,872	Filed June 30, 2000
For Mobile Navigation of Network-Based Electronic Information Using Spoken Input	
Group Art Unit 2155	Examiner F. Backer

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a response in the above identified application.

The requested extension and appropriate non-small-entity fee are as follows (check time period desired):

- ☐ One month (37 CFR 1.17(a)(1)) $
- ☒ Two months (37 CFR 1.17(a)(2)) $390.00
- ☐ Three months (37 CFR 1.17(a)(3)) $
- ☐ Four months (37 CFR 1.17(a)(4)) $
- ☐ Five months (37 CFR 1.17(a)(5)) $

☒ Applicant claims small entity status. See 37 CFR 1.27. Therefore, the fee amount shown above is reduced by one-half, and the resulting fee is: $ 195.00 .

☒ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Commissioner has already been authorized to charge fees in this application to a Deposit Account.

☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 20-0782 .

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I am the ☐ applicant/inventor.

☐ assignee of record of the entire interest. See 37 CFR 3.71

Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).

☒ attorney or agent of record.

☐ attorney or agent under 37 CFR 1.34(a).

Registration number if acting under 37 CFR 1.34(a). ______

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September 19, 2001
Date

Signature

KIN-WAH TONG, Reg. No. 39,400
Typed or printed name

09/25/2001 MWOLDEK1 00000030 09608872
01 FC:216 195.00 OP

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

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PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)	Docket Number (Optional) SRI 1P037B

In re Application of HALVERSON, et al		
Application Number 09/608,872	Filed June 30, 2000	
For Mobile Navigation of Network-Based Electronic Information Using Spoken Input		
Group Art Unit 2155	Examiner F. Backer	

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- ☐ Five months (37 CFR 1.17(a)(5)) $

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☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 20-0782 .

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☐ assignee of record of the entire interest. See 37 CFR 3.71

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☒ attorney or agent of record.

☐ attorney or agent under 37 CFR 1.34(a).

Registration number if acting under 37 CFR 1.34(a). ______ .

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September 19, 2001

Date

Signature

KIN-WAH TONG, Reg. No. 39,400

Typed or printed name

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

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#11
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SEP 21 2001

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IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE

PATENT APPLICATION

Applicant(s):	**HALVERSON, et al.**	Atty. Docket No.	**SRI 1P037B**
Serial No.:	**09/608,872**	Group Art Unit:	**2155**
Filed:	**June 30, 2000**	Examiner:	**F. Backer**
Title:	**MOBILE NAVIGATION OF NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN INPUT**		

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Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

REVOCATION OF PREVIOUS POWER OF ATTORNEY AND NEW APPOINTMENT

The undersigned assignee of the above-identified application hereby revokes all previous Powers of Attorney and appoints the following attorneys with full power to prosecute the application, to make alterations and amendments therein, and to transact all business in the United States Patent and Trademark Office connected therewith and with full power of substitution and revocation:

Raymond R. Moser, Jr.; Reg. No. 34,682; Kin-Wah Tong, Reg. No. 39,400; Robert Brush, Reg. No. 45,710; Steven Weiner, Reg. No. 38,360; and Edward E. Davis, Reg. No. 35,112.

CHANGE OF CORRESPONDENCE ADDRESS

Please change the correspondence address for the above-identified application to:

Thomason, Moser & Patterson, LLP
595 Shrewsbury Avenue – Suite 100
Shrewsbury, New Jersey 07702

Please direct all telephone calls to: Kin-Wah Tong, telephone # (732) 530-9404

SRI/4116-6

OIPE
SEP 2 1 2001
JC95
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<u>**CERTIFICATE UNDER 37 C.F.R. § 3.73(B)**</u>

SRI International, a corporation of the State of California, certifies that it is the assignee of the entire right, title and interest in the patent application identified above by virtue of:

An Assignment from the inventor(s) of the parent patent application that is claimed as priority in the above-identified patent application. The Assignment was recorded in the United States Patent and Trademark Office, for which a copy thereof is attached.

The undersigned (whose title is supplied below) is empowered to act on behalf of the assignee.

Respectfully submitted,

Date: 9/11/01

~~EDWARD E. DAVIS, Assistant Secretary~~
STEVEN WEINER, VICE PRESIDENT

SRI International
333 Ravenswood Avenue
Menlo Park, CA 94025
Telephone No.: 650-859-3115

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ASSIGNMENT OF PATENT APPLICATION

(Not Accompanying Application)

Whereas I/we the undersigned inventor(s) have invented certain new and useful improvements as set forth in the patent application entitled:

NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK

for which I/we have executed an application for a United States Letters Patent which was filed in the U.S. Patent and Trademark Office on March 13, 2000, and which bears the Application No. 09/524,095.

For good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, I/we the undersigned inventor(s) hereby:

1) Sell(s), assign(s) and transfer(s) to **SRI International**, a California non-profit corporation having a place of business at 333 Ravenswood Avenue, Menlo Park, California 94025, (hereinafter referred to as "ASSIGNEE"), the entire right title and interest in any and all improvements and inventions disclosed in, application(s) based upon, and Patent(s) (including foreign patents) granted upon the information which is disclosed in the above referenced application.

2) Authorize and request the Commissioner of Patents to issue any and all Letters Patents resulting from said application or any division(s), continuation(s), substitutes(s) or reissue(s) thereof to the ASSIGNEE.

3) Agree to execute all papers and documents and, entirely at the ASSIGNEE's expense, perform any acts which are reasonably necessary in connection with the prosecution of said application, as well as any derivative and applications thereof, foreign applications based thereon, and/or the enforcement of patents resulting from such applications.

4) Agree that the terms, covenants and conditions of this assignment shall inure to the benefit of the Assignee, its successors, assigns and other legal representative, and shall be binding upon the inventor(s), as well as the inventor's heirs, legal representatives and assigns.

5) Warrant and represent that I/we have not entered, and will not enter into any assignment, contract, or understanding that conflicts with this assignment.

Signed on the date(s) indicated beside my (our) signature(s).

1) Signature: [signature] Date: 6-16-00
Typed Name: Christine Halverson

2) Signature: ______ Date: ______
Typed Name: Luc Julia

3) Signature: [signature] Date: 6/16/00
Typed Name: Dimitris Voutsas

4) Signature: [signature] Date: 6/22/00
Typed Name: Adam Cheyer

Attny Docket No. SRI1P037

ASSIGNME[illegible]T OF PATENT APPLICATIO[illegible]
(Not Accompanying Application)

Whereas I/we the undersigned inventor(s) have invented certain new and useful improvements as set forth in the patent application entitled:

NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK

for which I/we have executed an application for a United States Letters Patent which was filed in the U.S. Patent and Trademark Office on March 13, 2000, and which bears the Application No. 09/524,095.

For good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, I/we the undersigned inventor(s) hereby:

1) Sell(s), assign(s) and transfer(s) to **SRI International**, a California non-profit corporation having a place of business at 333 Ravenswood Avenue, Menlo Park, California 94025, (hereinafter referred to as "ASSIGNEE"), the entire right title and interest in any and all improvements and inventions disclosed in, application(s) based upon, and Patent(s) (including foreign patents) granted upon the information which is disclosed in the above referenced application.

2) Authorize and request the Commissioner of Patents to issue any and all Letters Patents resulting from said application or any division(s), continuation(s), substitutes(s) or reissue(s) thereof to the ASSIGNEE.

3) Agree to execute all papers and documents and, entirely at the ASSIGNEE's expense, perform any acts which are reasonably necessary in connection with the prosecution of said application, as well as any derivative and applications thereof, foreign applications based thereon, and/or the enforcement of patents resulting from such applications.

4) Agree that the terms, covenants and conditions of this assignment shall inure to the benefit of the Assignee, its successors, assigns and other legal representative, and shall be binding upon the inventor(s), as well as the inventor's heirs, legal representatives and assigns.

5) Warrant and represent that I/we have not entered, and will not enter into any assignment, contract, or understanding that conflicts with this assignment.

Signed on the date(s) indicated beside my (our) signature(s).

1) Signature: Christine Halverson Date: 6-16-00.
Typed Name: Christine Halverson

2) Signature: [signature] Date: 6·20.00
Typed Name: Luc Julia

3) Signature: [signature] Date: 6/16/00
Typed Name: Dimitris Voutsas

4) Signature: ________ Date: ________
Typed Name: Adam Cheyer

Attny Docket No. SRI1P037

ASSIGNMENT OF PATENT APPLICATION

(Not Accompanying Application)

Whereas I/we the undersigned inventor(s) have invented certain new and useful improvements as set forth in the patent application entitled:

NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK

for which I/we have executed an application for a United States Letters Patent which was filed in the U.S. Patent and Trademark Office on March 13, 2000, and which bears the Application No. 09/524,095.

For good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, I/we the undersigned inventor(s) hereby:

1) Sell(s), assign(s) and transfer(s) to **SRI International**, a California non-profit corporation having a place of business at 333 Ravenswood Avenue, Menlo Park, California 94025, (hereinafter referred to as "ASSIGNEE"), the entire right title and interest in any and all improvements and inventions disclosed in, application(s) based upon, and Patent(s) (including foreign patents) granted upon the information which is disclosed in the above referenced application.

2) Authorize and request the Commissioner of Patents to issue any and all Letters Patents resulting from said application or any division(s), continuation(s), substitutes(s) or reissue(s) thereof to the ASSIGNEE.

3) Agree to execute all papers and documents and, entirely at the ASSIGNEE's expense, perform any acts which are reasonably necessary in connection with the prosecution of said application, as well as any derivative and applications thereof, foreign applications based thereon, and/or the enforcement of patents resulting from such applications.

4) Agree that the terms, covenants and conditions of this assignment shall inure to the benefit of the Assignee, its successors, assigns and other legal representative, and shall be binding upon the inventor(s), as well as the inventor's heirs, legal representatives and assigns.

5) Warrant and represent that I/we have not entered, and will not enter into any assignment, contract, or understanding that conflicts with this assignment.

Signed on the date(s) indicated beside my (our) signature(s).

1) Signature: Christine Halverson Date: 6-16-00.
Typed Name: Christine Halverson

2) Signature: ______________ Date: ________
Typed Name: Luc Julia

3) Signature: ______________ Date: 6/16/00
Typed Name: Dimitris Voutsas

4) Signature: ______________ Date: ________
Typed Name: Adam Cheyer

File History Content Report

The following content is missing from the original file history record obtained from the United States Patent and Trademark Office. No additional information is available.

Document Date - 2001-10-01

Document Title - USPTO Communication Re: Power of Attorney

File History Content Report

The following content is missing from the original file history record obtained from the United States Patent and Trademark Office. No additional information is available.

Document Date - 2001-10-01

Document Title - USPTO Communication Re: Change of Address

#13

UNITED STATES PATENT AND TRADEMARK OFFICE

COMMISSIONER FOR PATENTS
UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. 20231
www.uspto.gov

APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/608,872	06/30/2000	Christine Halversen	SRIlp037B

CONFIRMATION NO. 2382

OC000000006829467

OC000000006829467

THOMASON, MOSER & PATTERSON, LLP
595 SHREWSBURY AVENUE
SUITE 100
SHREWSBURY, NJ 07702

Date Mailed: 10/02/2001

NOTICE REGARDING POWER OF ATTORNEY

This is in response to the Power of Attorney filed 09/21/2001.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Lavinia Johnson

LAVINIA D JOHNSON
2100 7033085229

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#11

UNITED STATES PATENT AND TRADEMARK OFFICE

COMMISSIONER FOR PATENTS
UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. 20231
www.uspto.gov

APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/608,872	06/30/2000	Christine Halversen	SRIlp037B

CONFIRMATION NO. 2382

OC000000006829442
OC000000006829442

C. DOUGLAS McDONALD, ESQ.
CALTON FIELDS, et al.
P. O. BOX 3239
TAMPA,, FL 33601-3239

Date Mailed: 10/02/2001

NOTICE REGARDING POWER OF ATTORNEY

This is in response to the Power of Attorney filed 09/21/2001.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

Lavinia Johnson

LAVINIA D JOHNSON
2100 7033085229

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UNITED ST[illegible] DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/608,872	06/30/00	HALVERSEN C	SRILP037B

TM02/1010

THOMASON, MOSER & PATTERSON, LLP
595 SHREWSBURY AVENUE
SUITE 100
SHREWSBURY NJ 07702

EXAMINER	
BACKER, F	
ART UNIT	PAPER NUMBER
2155	14

DATE MAILED: 10/10/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

PTO-90C (Rev. 2/95)
*U.S. GPO: 2000-473-000/44602

1- File Copy

Office Action Summary	Application No. 09/608,872	Applicant(s) HALVERSEN ET AL.
	Examiner Firmin Backer	Art Unit 2155

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 26 September 2001.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 56-82 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 56-82 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) ☐ Notice of References Cited (PTO-892)
16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
18) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
19) ☐ Notice of Informal Patent Application (PTO-152)
20) ☐ Other:

Response to Request for Reconsideration

This is in response to a request for reconsideration file on September 26th, 2001. Claims 56-82 are being reconsidered in this action.

Double Patenting

1. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

2. Claims 56-82 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 56-126 of copending Application No. 09/524,095. Although the conflicting claims are not identical, they are not patentably distinct. It would have been obvious to one of ordinary skill in the art to observed that the omission of the limitations "**soliciting additional input from the user, including user interaction in a modality different that the original request and, refining the navigation query, based upon the additional input**", of applicant claims 56-82 are already in the Co-pending application 09/524,095, as such they are obvious variation of the inventive concept defined in claims 56-126 of the Co-pending application 09/524,095. See In re Karlson, 136USPQ 184 (CCPA 1963). This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

4. Claims 56-82 are rejected under 35 U.S.C. 102(e) as being anticipated by Levin et al. (U.S. Patent No. 6,173,279).

5. As per claim 56, Levin et al teach a method for speech-based navigation (*information server, 110*) of an electronic data source located at one or more network servers located remotely from a user, wherein at least a portion of a data link between a mobile information appliance of the user and the one or more network servers utilizes wireless communication (see abstract, fig 1, column 3 lines 5-35), comprising receiving a spoken request (*receive a natural language query*), for desired information from the user (*user, 112*) utilizing the mobile information appliance (*PC, 102*) of the user; rendering an interpretation (*creating a semantic representation*) of the spoken request, constructing a navigation (*generating search)* query based upon the interpretation; utilizing the navigation query to select a portion of the electronic data source; and transmitting (*sending*) the selected portion of the electronic data source from the network server to the mobile information appliance of the user. (see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22)

6. As per claim 57, 58, 62-64, Levin et al teach a method of rendering the interpretation of the spoken request is performed at the one or more network servers by the mobile information appliance including a wireless telephone, a portable computer that is a personal digital assistance (see abstract, fig 1, column 3 lines 5-35).

7. As per claim 59, Levin et al teach a method of soliciting additional input from the user, including user interaction in a modality different than the original request; refining the navigation query, based upon the additional input; and using the refined navigation query to select a portion of the electronic data source (see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22).

8. As per claim 60, Levin et al teach a method wherein the data link includes a cellular telephone system (see fig 1, column 2 line 61-67).

9. As per claim 61, Levin et al teach a method wherein steps (a)-(d) are performed with respect to multiple users (see abstract, fig 1, column 3 lines 5-35).

10. As per claim 65, Levin et al teach a computer system for speech-based navigation (information server, 110) of an electronic data source located at one or more network servers located remotely from a user, wherein at least a portion of a data link between a mobile information appliance of the user and the one or more network servers utilizes wireless communication (see abstract, fig 1, column 3 lines 5-35), comprising a code segment receiving a

spoken request (*receive a natural language query*) for desired information from the user (user) utilizing the mobile information appliance (PC, 102) of the user; a code segment rendering an interpretation (*creating a semantic representation*) of the spoken request, a code segment constructing a navigation (*generating search)* query based upon the interpretation; a code segment utilizing the navigation query to select a portion of the electronic data source; and a code segment transmitting the selected portion of the electronic data source from the network server to the mobile information appliance of the user. (see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22)

11. As per claim 66, 67, 71-73, Levin et al teach a system of rendering the interpretation of the spoken request is performed at the one or more network servers by the mobile information appliance including a wireless telephone, a portable computer that is a personal digital assistance (see abstract, fig 1, column 3 lines 5-35).

12. As per claim 68, Levin et al teach a system of soliciting additional input from the user, including user interaction in a modality different than the original request; refining the navigation query, based upon the additional input; and using the refined navigation query to select a portion of the electronic data source (see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22).

13. As per claim 69, Levin et al teach a system wherein the data link includes a cellular telephone system (see fig 1, column 2 line 61-67).

14. As per claim 70, Levin et al teach a system wherein steps (a)-(d) are performed with respect to multiple users (see abstract, fig 1, column 3 lines 5-35).

15. As per claim 74, Levin et al teach a system for speech-based navigation (information server, 110) of an electronic data source located at one or more network servers located remotely from a user, wherein at least a portion of a data link between a mobile information appliance of the user and the one or more network servers utilizes wireless communication (see abstract, fig 1, column 3 lines 5-35), comprising receiving a spoken request (*receive a natural language query*) for desired information from the user (user) utilizing the mobile information appliance (PC, 102) of the user; rendering an interpretation (*creating a semantic representation*) of the spoken request, constructing a navigation (*generating search)* query based upon the interpretation; utilizing the navigation query to select a portion of the electronic data source; and transmitting the selected portion of the electronic data source from the network server to the mobile information appliance of the user. (see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22)

16. As per claim 75, 76, 80-81, Levin et al teach a method of rendering the interpretation of the spoken request is performed at the one or more network servers by the mobile information appliance including a wireless telephone, a portable computer that is a personal digital assistance (see abstract, fig 1, column 3 lines 5-35).

17. As per claim 77, Levin et al teach a system of soliciting additional input from the user, including user interaction in a modality different than the original request; refining the

navigation query, based upon the additional input; and using the refined navigation query to select a portion of the electronic data source (see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22).

18. As per claim 78, Levin et al teach a system wherein the data link includes a cellular telephone system (see fig 1, column 2 line 61-67).

19. As per claim 79, Levin et al teach a system wherein steps (a)-(d) are performed with respect to multiple users (see abstract, fig 1, column 3 lines 5-35).

Response to Arguments

1. Applicant's arguments filed on September 26th, 2001 have been fully considered but they are not persuasive. ***

a. Applicant argues that the statutory-type obviousness double patenting is not appropriate. Examiner respectfully disagrees with applicant characterization of the statutory-type obviousness double patenting concept. The inventive concepts in the applications are not patenbly different. Different variation of the same inventive concept is being claimed twice. According to MPEP in determining whether a statutory basis for a double patenting rejection exists, the question to be asked is: Is the same invention being claimed twice? 35 U.S.C. 101 prevents two patents from issuing on the same invention. "Same invention" means identical subject matter. Miller v. Eagle Mfg. Co., 151 U.S.

186 (1984); In re Vogel, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and In re Ockert, 245 F.2d 467, 114 USPQ 330 (CCPA 1957).

b. Applicant further argues that the prior art "fails to teach or suggest the novel concept of speech-based navigation where the method receives spoken request for desired information from the user utilizing the mobile information appliance of the user and where in turn the selected electronic data source from the network server is transmitted to the mobile information appliance of the user." Examiner respectfully disagrees with the applicant perspective and characterization of Levin inventive concept. Levin teach that use of a personal computer, a user establishes connection with a network. In the field of the network communication, a personal computer is not limited to desktop, but also handheld computer as well as laptop which are considered to be mobile appliances. In Levin inventive concept, an information server 110 receives natural language which is the same as spoken word. One the natural language query is process, the service host then transmit the result of the query to the pc. (see column 3 lines 5-35, 6 lines 25-59).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Firmin Backer whose telephone number is 703-305-0624. The examiner can normally be reached on Mon-Thu 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sheikh Ayaz can be reached on 703-305-9648. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3718 for regular communications and 703-305-5352 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Firmin Backer
October 2, 2001

AYAZ SHEIKH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

TELEFAX COVER SHEET

MOSER, PATTERSON & SHERIDAN
ATTORNEYS AT LAW
595 SHREWSBURY AVENUE
FIRST FLOOR
SHREWSBURY, NJ 07702
TELEPHONE (732) 530-9404
TELEFAX (732) 530-9808

Official

1/10/02

****

THIS TELEFAX MESSAGE IS ADDRESSED TO THE PERSON OR COMPANY LISTED BELOW. IF IT WAS SENT OR RECEIVED INCORRECTLY, OR YOU ARE NOT THE INTENDED RECIPIENT, PLEASE TAKE NOTICE THAT THIS MESSAGE MAY CONTAIN PRIVILEGED OR CONFIDENTIAL MATERIAL, AND YOUR DUE REGARD FOR THIS INFORMATION IS NECESSARY. YOU MAY ARRANGE TO RETURN THIS MATERIAL BY CALLING THE FIRM LISTED ABOVE AT (732) 530-9404

****

THIS MESSAGE HAS 13 PAGES INCLUDING THIS SHEET

TO: Assistant Commissioner of Patents

FAX NO.: 703-746-7238

FROM: Kin-Wah Tong

DATE: January 10, 2002

MATTER: Serial No. 09/608,872 Filed: June 30, 2000

DOCKET NO.: SRI 1P037B

APPLICANT: HALVERSON, et al

The following has been received in the U.S. Patent and Trademark Office on the date of this facsimile:

___ Petition
___ Disclosure Statement & PTO-1449
___ Priority Document
___ Drawings (____ sheets) informal
X Response Under 37 CFR 1.116
X Transmittal Letter (2 copies)
___ Fee Transmittal (2 copies)
___ Deposit Account Transaction
X Facsimile Transmission Certificate dated January 10, 2002

CERTIFICATE OF TRANSMISSION UNDER 37 C.F.R. §1.6

I hereby certify that this correspondence is being transmitted by facsimile to the Assistant Commissioner for Patents, Box AF, Washington, DC 20231 on January 10, 2002, Facsimile No. 703-746-7238.

Linda DeNardi
Name of person signing this certificate

Linda DeNardi January 10, 2002
Signature and date

Received from < 732 530 9808 > at 1/10/02 4:06:40 PM [Eastern Standard Time]

PTO/SB/21 (08-00)

Please type a plus sign (+) inside this box → [+]

Approved for use through 10/31/2002. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	09/608,872
Filing Date	June 30, 2000
First Named Inventor	HALVERSON
Group Art Unit	2155
Examiner Name	F. BACKER
Attorney Docket Number	SRI 1 P 037B
Total Number of Pages in This Submission	13

ENCLOSURES *(check all that apply)*

☐ Fee Transmittal Form	☐ Assignment Papers *(for an Application)*	☐ After Allowance Communication to Group
☐ Fee Attached	☐ Drawing(s)	☐ Appeal Communication to Board of Appeals and Interferences
☒ Amendment / Response	☐ Licensing-related Papers	☐ Appeal Communication to Group *(Appeal Notice, Brief, Reply Brief)*
☐ After Final	☐ Petition	☐ Proprietary Information
☐ Affidavits/declaration(s)	☐ Petition to Convert to a Provisional Application	☐ Status Letter
☐ Extension of Time Request	☐ Power of Attorney, Revocation Change of Correspondence Address	☐ Other Enclosure(s) *(please identify below)*:
☐ Express Abandonment Request	☐ Terminal Disclaimer	
☐ Information Disclosure Statement	☐ Request for Refund	
	☐ CD, Number of CD(s)	
☐ Certified Copy of Priority Document(s)	Remarks	It is believed no fee is due. However, in the event a fee is due, kindly charge that fee to deposit account number 20-0782. To facilitate that charge, a duplicate copy of this letter is enclosed
☐ Response to Missing Parts/ Incomplete Application		
☐ Response to Missing Parts under 37 CFR 1.52 or 1.53		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	PATRICIA A. VERLANGIERI, Reg. No. 42,201
Signature	
Date	January 10, 2001

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be send to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

PTO/SB/21 (08-00)

Please type a plus sign (+) inside this box → [+]

Approved for use through 10/31/2002. OMB 0651-0031.
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	09/608,872
Filing Date	June 30, 2000
First Named Inventor	HALVERSON
Group Art Unit	2155
Examiner Name	F. BACKER
Attorney Docket Number	SRI 1 P 037B
Total Number of Pages in This Submission	13

ENCLOSURES *(check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☒ Amendment / Response
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Response to Missing Parts/ Incomplete Application
  - ☐ Response to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Assignment Papers *(for an Application)*
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s)
- ☐ After Allowance Communication to Group
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☐ Appeal Communication to Group *(Appeal Notice, Brief, Reply Brief)*
- ☐ Proprietary Information
- ☐ Status Letter
- ☐ Other Enclosure(s) *(please Identify below)*:

Remarks: **It is believed no fee is due. However, in the event a fee is due, kindly charge that fee to deposit account number 20-0782. To facilitate that charge, a duplicate copy of this letter is enclosed**

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	PATRICIA A. VERLANGIERI, Reg. No. 42,201
Signature	Patricia A. Verlangieri
Date	January 10, 2001

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be send to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

#16/C
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~~Ad~~
Enter
2-8-02

09/608,872

IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE

PATENT APPLICATION

RECEIVED
JAN 1 0 2002
Technology Center 2100

Applicant: **Halverson et al.**

Case: **SRI1P037B**

Serial No.: **09/608,872** Filed: **June 30, 2000**

Group Art Unit: **2155**

Examiner: **Firmin Backer**

Title: **MOBILE NAVIGATION OF NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN INPUT**

ASSISTANT COMMISSIONER FOR PATENTS
Box AF
Washington, D. C. 20231

S I R:

RESPONSE UNDER 37 C.F.R. § 1.116

This response addresses the Final Office Action dated October 10, 2001 (Paper No. 14).

IN THE CLAIMS

Please amend claims 56 and 65 as shown below. These claims are "clean version" of the amended claims, i.e., with changes incorporated into the claims, whereas the Appendix to this Amendment illustrates the amended claims using underlines and brackets to indicate addition and deletion, respectively.

56. (Amended) A method for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, wherein a data link is established between a mobile information appliance of the user and the one or more network servers, comprising the steps of:

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(a) receiving a spoken request for desired information from the user utilizing the mobile information appliance of the user;

(b) rendering an interpretation of the spoken request;

(c) constructing a navigation query based upon the interpretation;

(d) utilizing the navigation query to select a portion of the electronic data source; and

(e) transmitting the selected portion of the electronic data source from the network server to the mobile information appliance of the user, wherein at least a portion of said data link between said mobile information appliance of the user and the one or more network servers utilizes wireless communication.

65. (Amended) A computer program embodied on a computer readable medium for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, wherein a data link is established between a mobile information appliance of the user and the one or more network servers, comprising:

(a) a code segment that receives a spoken request for desired information from the user utilizing the mobile information appliance of the user;

(b) a code segment that renders an interpretation of the spoken request;

(c) a code segment that constructs a navigation query based upon the interpretation;

(d) a code segment that utilizes the navigation query to select a portion of the electronic data source; and

(e) a code segment that transmits the selected portion of the electronic data source from the network server to the mobile information appliance of the user, wherein at least a portion of said data link between said mobile information appliance of the user and the one or more network servers utilizes wireless communication.

REMARKS

Applicants' representative would like to thank Examiner Backer and Primary Examiner Etienne for kindly taking a substantial amount of time on January 8, 2002 to

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discuss the merits of the subject invention. Applicants' representative is aware of the time constraint that is placed on the Examiners and is appreciative of the Examiners' willingness to devote such large quantity of time to discuss the case on the merit.

In view of the following discussion, the Applicants submit that none of the claims now pending in the application are anticipated under the provisions of 35 U.S.C. § 102. Thus, the Applicants believe that all of these claims are now in allowable form.

I. REJECTION OF CLAIMS 56-82 UNDER DOUBLE PATENTING

The Examiner provisionally rejected claims 56-82 in Paragraphs 1-2 of the Final Office Action based on statutory type double patenting under 35 U.S.C. § 101 as claiming the same invention as that of claims 56-126 of copending Application No. 09/524,095. Applicants respectfully traverse the rejection.

First, the Examiner noted that "it would have been obvious to one of ordinary skill in the art to observe that the omission of the limitations '**soliciting additional input from the user, including user interaction in a modality different tha[n] the original request and, refining the navigation query, based upon the additional input**'. After noting the differences between the scope of the claims between the two applications, the Examiner then concluded that claims 56-82 "are obvious variation of the inventive concept defined in claims 56-126 of co-pending application 09/524,095".

Pursuant to the Examiner Interview, Applicants again directed Examiner's attention to the fact that there are two types of double patenting rejections: "statutory" and "non-statutory (obviousness-type)". MPEP 804 states that "[i]n determining whether a statutory basis for a double patenting rejection exists, the question to be asked is: Is the same invention being claimed twice?" "A reliable test for double patenting under 35 U.S.C. 101 is whether a claim in the application could be literally infringed without literally infringing a corresponding claim in the patent". Given the substantial differences between the claims of the two applications as noted by the Examiner, Applicants respectfully submit that applying the statutory double patenting test as promoted in the MPEP would not produce a statutory double patenting rejection in the present application.

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Second, it should be noted that the present application is a continuation of the co-pending application 09/524,095. As such, if and when these two applications mature into issued patents, both patents will have the same term.

As such, Applicants submit that the present statutory double patenting rejection against claims 56-82 is inappropriate. The Examiners indicated that they will reconsider the present statutory type double patenting under 35 U.S.C. § 101.

II. REJECTION OF CLAIMS 56-82 UNDER 35 U.S.C. § 102

The Examiner has rejected claims 56-82 in Paragraphs 4-19 of the Final Office Action as being anticipated by the Levin et al. patent (US Patent 6,173,279 issued January 9, 2001, hereinafter referred to as Levin). The rejection is respectfully traversed.

Levin teaches "a method of using at least one natural language query to retrieve information from one or more data resources and further performing a requested action using the retrieved information is disclosed". (See Levin, Column 2, lines 15-18) Namely, Levin teaches a method for using natural language query to obtain information, where upon receipt of the requested information, a desired action is executed based upon the requested information. To illustrate, Levin provides the example, where a user employs natural language to request the telephone number of a restaurant. Upon receipt of the telephone number, the telephone number is actually dialed for the user. (See Levin, Column 3 line 62 to Column 4, line 1).

In contrast, Levin fails to teach or suggest the novel concept of speech-based navigation where the method receives spoken request for desired information from the user utilizing the mobile information appliance of the user and where, in turn, the selected electronic data source from the network server is transmitted to the mobile information appliance of the user, wherein at least a portion of said data link between said mobile information appliance of the user and the one or more network servers utilizes wireless communication. Specifically, Applicants' independent claims 56, 65 and 74 positively recite:

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56. A method for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, wherein a data link is established between a mobile information appliance of the user and the one or more network servers, comprising the steps of:

(a) receiving a spoken request for desired information from the user utilizing the mobile information appliance of the user;

(b) rendering an interpretation of the spoken request;

(c) constructing a navigation query based upon the interpretation;

(d)utilizing the navigation query to select a portion of the electronic data source; and

(e) transmitting the selected portion of the electronic data source from the network server to the mobile information appliance of the user, wherein at least a portion of said data link between said mobile information appliance of the user and the one or more network servers utilizes wireless communication. (emphasis added)

65. A computer program embodied on a computer readable medium for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, wherein a data link is established between a mobile information appliance of the user and the one or more network servers, comprising:

(a) a code segment that receives a spoken request for desired information from the user utilizing the mobile information appliance of the user;

(b) a code segment that renders an interpretation of the spoken request;

(c) a code segment that constructs a navigation query based upon the interpretation;

(d) a code segment that utilizes the navigation query to select a portion of the electronic data source; and

(e) a code segment that transmits the selected portion of the electronic data source from the network server to the mobile information appliance of the user, wherein at least a portion of said data link between said mobile information appliance of the user and the one or more network servers utilizes wireless communication. (emphasis added)

74. A system for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, comprising:

(a) a mobile information appliance operable to receive a spoken request for desired information from the user;

(b) spoken language processing logic, operable to render an interpretation of the spoken request;

(c) query construction logic, operable to construct a navigation query based upon the interpretation;

(d) navigation logic, operable to select a portion of the electronic data source using the navigation query, and

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(e) electronic communications infrastructure for transmitting the selected portion of the electronic data source from the network server to the mobile information appliance of the user, wherein at least a portion of a data link of the electronic communications infrastructure between a mobile information appliance of the user and the one or more network servers utilizes wireless communication. (emphasis added)

Applicants' invention teaches a novel method and apparatus for speech-based navigation where the method receives spoken request for desired information from the user utilizing the **mobile information appliance** of the user and where, in turn, the selected electronic data source from the network server is **transmitted to the mobile information appliance** of the user, wherein at least a portion of said data link between said mobile information appliance of the user and the one or more network servers utilizes wireless communication. Specifically, Applicants address the criticality of providing speech-based navigation via a mobile, i.e., wireless communication, approach in addition to spoken natural language. It has been noted that with the proliferation of various mobile appliances, it would be advantageous to allow these mobile appliances to access the same vastness of electronic data sources that are available to hard-wired appliances like a desktop computer. However, the very essence of a mobile appliance is its portability, small size and ease of use. As such, unlike hard-wired appliances, mobile appliances are not equipped with large bulky input devices. In fact, even if the mobile appliance is equipped with extensive input devices, most users would still find these "shrunken" input devices to be cumbersome and difficult to use, e.g., an electronic representation of a keyboard on a PDA and the like.

To further exacerbate the problem, obtaining information from an electronic data source may require extensive and complex interaction between the user's mobile appliance and the system holding the electronic data source. Thus, the limited or cumbersome input/output capability of a mobile appliance presents a substantial barrier to its ability to access a data resource that requires extensive and complex interaction.

In contrast, Levin teaches that "[u]sing a personal computer (PC) 102, a user establishes a connection with packet network 108 via an access server 106". Levin then states that "[t]he user may also use a telephone 103 to connect to the packet

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network 108" and that "[t]ypically a modem connection (not shown) may be used to connect the PC 102 to the packet 108 in a conventional manner". (emphasis added) (See Levin, Column 3, lines 5-10). Additionally, Levin states that "[t]he PC 102 dials into an access server 106 that is connected to the Internet or other database service via a logical network interface (not shown)" and that "[t]he logical network interface may be a local area network (LAN), a Serial Line Internet Protocol (SLIP) connection over a modem, an ISDN port or via a connection to a special LAN such as an ATM LAN or a LAN that offers bandwidth reservation". (See Levin, Column 4, lines 23-29) It is respectfully submitted that none of Levin's statements provides any specific teaching as to mobile appliances or wireless communication. In fact, terms such as "modem connection" and "ISDN port" are typically associated with hard-wired appliances. Thus, Levin does not teach or disclose a method that receives spoken request for desired information from the user utilizing the mobile information appliance of the user and where, in turn, the selected electronic data source from the network server is transmitted to the mobile information appliance of the user via wireless communication over at least a portion of the data link. Namely, the scope of Applicants' claims is specifically directed to speech-based navigation via mobile information appliances. This novel concept is not disclosed by the Levin reference and Applicants' claims would not read on the Levin reference.

Pursuant to the Examiner Interview, Applicants have agreed to incorporate the term " wherein at least a portion of said data link between said mobile information appliance of the user and the one or more network servers utilizes wireless communication", into the body of the independent claims. This term previously existed in the preamble of the independent claims. Thus, since this term previously existed in the originally filed independent claims, the present amendment is not implemented in view of the cited prior art. In fact, Applicants take the position that the scope of the independent claims did not change as a result of this amendment and that this amendment served to clarify the claims to the Examiner's satisfaction.

Additionally, it should be noted that no amendment was applied to independent claim 74, since the above-identified term is already in the body of the independent claim

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74.

Therefore, the Applicants respectfully submit that independent claims 56, 65 and 74 are not anticipated by the Levin reference. As such, claims 56, 65 and 74 fully satisfy the requirements of 35 U.S.C. §102 and are patentable thereunder.

Claims 57-64, 66-73 and 75-82 depend, either directly or indirectly, from claims 56, 65 and 74 and recite additional features therefor. Since Levin fails to anticipate Applicants' invention as recited in Applicants' independent claims 56, 65 and 74, dependent claims 57-64, 66-73 and 75-82 are also not anticipated under 35 U.S.C. § 102 and are allowable for the same reason noted above.

Conclusion

Thus, the Applicants submit that all of these claims now fully satisfy the requirements of 35 U.S.C. §102. Consequently, the Applicants believe that all these claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues requiring the maintenance of the present final action in any of the claims now pending in the application, it is requested that the Examiner telephone Mr. Kin-Wah Tong, Esq. at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

1/10/02

Kin-Wah Tong, Attorney
Reg. No. 39,400
(732) 530-9404

Moser, Patterson & Sheridan, LLP
595 Shrewsbury Avenue
First Floor,
Shrewsbury, New Jersey 07702

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Appendix
(Marked-up copy of amended claims)

56. (Amended) A method for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, wherein [at least a portion of] a data link is established between a mobile information appliance of the user and the one or more network servers [utilize wireless communication], comprising the steps of:

(a) receiving a spoken request for desired information from the user utilizing the mobile information appliance of the user;

(b) rendering an interpretation of the spoken request;

(c) constructing a navigation query based upon the interpretation;

(d)utilizing the navigation query to select a portion of the electronic data source; and

(e) transmitting the selected portion of the electronic data source from the network server to the mobile information appliance of the user, wherein at least a portion of said data link between said mobile information appliance of the user and the one or more network servers utilizes wireless communication.

65. (Amended) A computer program embodied on a computer readable medium for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, wherein [at least a portion of] a data link is established between a mobile information appliance of the user and the one or more network servers [utilizes wireless communication], comprising:

(a) a code segment that receives a spoken request for desired information from the user utilizing the mobile information appliance of the user;

(b) a code segment that renders an interpretation of the spoken request.

(c) a code segment that constructs a navigation query based upon the interpretation;

(d) a code segment that utilizes the navigation query to select a portion of the electronic data source; and

(e) a code segment that transmits the selected portion of the electronic data source from the network server to the mobile information appliance of the user, wherein at least a portion of said data link between said mobile information appliance of the user and the one or more network servers utilizes wireless communication.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/608,872	06/30/2000	Christine Halversen	SRIlp037B	2382

7590 01/16/2002

THOMASON, MOSER & PATTERSON, LLP
595 SHREWSBURY AVENUE
SUITE 100
SHREWSBURY, NJ 07702

EXAMINER	
BACKER, FIRMIN	
ART UNIT	**PAPER NUMBER**
2155	15

DATE MAILED: 01/16/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

Interview Summary	**Application No.** 09/608,872	**Applicant(s)** HALVERSEN ET AL.	
	Examiner Firmin Backer	**Art Unit** 2155	

All participants (applicant, applicant's representative, PTO personnel):

(1) *Firmin Backer*. (3)*Kin-Wah Tong*.

(2) *Ario Etienne*. (4)_____.

Date of Interview: *08 January 2002* .

Type: a)☒ Telephonic b)☐ Video Conference
c)☐ Personal [copy given to: 1)☐ applicant 2)☐ applicant's representative]

Exhibit shown or demonstration conducted: d)☐ Yes e)☐ No.
If Yes, brief description: _____ .

Claim(s) discussed: *56* .

Identification of prior art discussed: *6,173,279* .

Agreement with respect to the claims f)☐ was reached. g)☐ was not reached. h)☐ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: *Applicant argues that the statutory double patenting rejection is improper and should be withdrawn. Applicant argues that the prior art fails to teach all the limitations of the inventive concept especially the use of wireless communication...* .

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

i)☐ It is not necessary for applicant to provide a separate record of the substance of the interview(if box is checked).

Unless the paragraph above has been checked, THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

Examiner Note: You must sign this form unless it is an Attachment to a signed Office action.

Firmin Backer
Examiner's signature, if required

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/608,872	06/30/2000	Christine Halversen	SRIlp037B	2382

7590 01/28/2002

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EXAMINER	
BACKER, FIRMIN	

ART UNIT	PAPER NUMBER
2155	17

DATE MAILED: 01/28/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

Advisory Action	Application No.	Applicant(s)	
	09/608,872	HALVERSEN ET AL.	
	Examiner	Art Unit	
	Firmin Backer	2155	

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 17 January 2002 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE. Therefore, further action by the applicant is required to avoid abandonment of this application. A proper reply to a final rejection under 37 CFR 1.113 may only be either: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114.

PERIOD FOR REPLY [check either a) or b)]

a) ☒ The period for reply expires 3 months from the mailing date of the final rejection.

b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection. ONLY CHECK THIS BOX WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

1. ☐ A Notice of Appeal was filed on _____. Appellant's Brief must be filed within the period set forth in 37 CFR 1.192(a), or any extension thereof (37 CFR 1.191(d)), to avoid dismissal of the appeal.

2. ☒ The proposed amendment(s) will not be entered because:

(a) ☒ they raise new issues that would require further consideration and/or search (see NOTE below);

(b) ☐ they raise the issue of new matter (see Note below);

(c) ☐ they are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or

(d) ☐ they present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: *See Continuation Sheet*.

3. ☐ Applicant's reply has overcome the following rejection(s): _____.

4. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).

5. ☐ The a)☐ affidavit, b)☐ exhibit, or c)☐ request for reconsideration has been considered but does NOT place the application in condition for allowance because: _____.

6. ☐ The affidavit or exhibit will NOT be considered because it is not directed SOLELY to issues which were newly raised by the Examiner in the final rejection.

7. ☒ For purposes of Appeal, the proposed amendment(s) a)☐ will not be entered or b)☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.

The status of the claim(s) is (or will be) as follows:

Claim(s) allowed: _____.

Claim(s) objected to: _____.

Claim(s) rejected: 56-82.

Claim(s) withdrawn from consideration: _____.

8. ☐ The proposed drawing correction filed on _____ is a)☐ approved or b)☐ disapproved by the Examiner.

9. ☐ Note the attached Information Disclosure Statement(s)(PTO-1449) Paper No(s). _____.

10. ☐ Other: _____

Continuation of 2. NOTE: The proposed amendments will not be entered because the raised new issue such as in claims 56 and 65 "wherein at least a portion of said data link between said mobile information appliance of the user and the one or more network utilizes wireless communication" that require further search and/or consideration .

AYAZ SHEIKH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

TELEFAX COVER SHEET

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Official

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TO: Assistant Commissioner of Patents

FAX NO.: 703-746-7238

FROM: Kin-Wah Tong

DATE: February 8, 2002

MATTER: Serial No. 09/608,872 Filed: June 30, 2000

DOCKET NO.: SRI 1P037B

APPLICANT: HALVERSON, et al

The following has been received in the U.S. Patent and Trademark Office on the date of this facsimile:

- ___ Petition
- ___ Disclosure Statement & PTO-1449
- ___ Priority Document
- ___ Drawings (____ sheets) informal
- X Petition for Extension of Time (2 copies)
- X RCE Transmittal Letter
- X Fee Transmittal (2 copies)
- X Deposit Account Transaction
- X Facsimile Transmission Certificate dated February 8, 2002

CERTIFICATE OF TRANSMISSION UNDER 37 C.F.R. §1.6

I hereby certify that this correspondence is being transmitted by facsimile to the Assistant Commissioner for Patents, Box AF, Washington, DC 20231 on February 8, 2002, Facsimile No. 703-746-7238.

Linda DeNardi
Name of person signing this certificate

Linda DeNardi February 8, 2002
Signature and date

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REQUEST FOR CONTINUED EXAMINATION (RCE) TRANSMITTAL

Subsection (b) of 35 U.S.C. § 132, effective on May 29, 2000, provides for continued examination of an utility or plant application filed on or after June 8, 1995.
See The American Inventors Protection Act of 1999 (AIPA).

Application Number	09/608,872
Filing Date	June 30, 2000
Examiner Name	F. Backer
First Named Inventor	Halversen
Group Art Unit	2155
Attorney Docket Number	SRI 1P037B

#18 8-8-02

This is a Request for Continued Examination (RCE) under 37 C.F.R. § 1.114 of the above-identified application.
NOTE: *37 C.F.R. § 1.114 is effective on May 29, 2000. If the above-identified application was filed prior to May 29, 2000, applicant may wish to consider filing a continued prosecution application (CPA) under 37 C.F.R. § 1.53 (d) (PTO/SB/29) instead of a RCE to be eligible for* the patent term adjustment provisions of the AIPA. See Changes to Application Examination and Provisional Application Practice, Interim Rule, 65 *Fed. Reg.* 14865 (Mar. 20, 2000), 1233 *Off. Gaz. Pat. Office* 47 (Apr. 11, 2000), which established RCE practice.

1. Submission required under 37 C.F.R. § 1.114
   - a. ☒ Previously submitted
     - i. ☒ Consider the amendment(s)/reply under 37 C.F.R. § 1.116 previously filed on 1/10/02
       (Any unentered amendment(s) referred to above will be entered).
     - ii. ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
     - iii. ☐ Other _____
   - b. Enclosed
     - i. ☐ Amendment/Reply
     - ii ☐ Affidavit(s)/Declaration(s)
     - iii. ☐ Information Disclosure Statement (IDS)
     - iv. ☐ Other _____
2. Miscellaneous
   - a. ☐ Suspension of action on the above-identified application is requested under 37 C.F.R. § 1.103(c) for a period of _____ months. (Period of suspension shall not exceed 3 months; Fee under 37 C.F.R. § 1.17(i) required)
   - b. ☒ Other Extension Request and Fee Transmittal Sheet
3. Fees The RCE fee under 37 C.F.R. § 1.17(e) is required by 37 C.F.R. § 1.114 when the RCE is filed.
   - a. ☒ The Director is hereby authorized to charge the following fees, or credit any overpayments, to Deposit Account No. 20-0782
     - i. ☒ RCE fee required under 37 C.F.R. § 1.17(e)
     - ii. ☒ Extension of time fee (37 C.F.R. §§ 1.136 and 1.17)
     - iii. ☐ Other
   - b. ☐ Check in the amount of $_____ enclosed
   - c. ☐ Payment by credit card (Form PTO-2038 enclosed)

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED			
Name (Print/Type)	KIN-WAH TONG	*Registration No. (Attorney/Agent)*	39,400
Signature	[signature]	*Date*	February 8, 2002

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND Fees and Completed Forms to the following address: Commissioner for Patents, Box RCE, Washington, DC 20231.

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02 FC:279 370.00 CH

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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)	Docket Number (Optional) SRI 1P037B

In re Application of HALVERSEN	
Application Number 09/608,872	Filed June 30, 2000
For Mobile Navigation of Network-Based Electronic Information Using Spoken Input	
Group Art Unit 2155	Examiner F. Backer

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a response in the above identified application.

The requested extension and appropriate non-small-entity fee are as follows (check time period desired):

- ☒ One month (37 CFR 1.17(a)(1)) $110.00
- ☐ Two months (37 CFR 1.17(a)(2)) $
- ☐ Three months (37 CFR 1.17(a)(3)) $
- ☐ Four months (37 CFR 1.17(a)(4)) $
- ☐ Five months (37 CFR 1.17(a)(5)) $

☒ Applicant claims small entity status. See 37 CFR 1.27. Therefore, the fee amount shown above is reduced by one-half, and the resulting fee is: $ 55.00 .

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Commissioner has already been authorized to charge fees in this application to a Deposit Account.

☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 20-0782 .
I have enclosed a duplicate copy of this sheet.

I am the ☐ applicant/inventor.

☐ assignee of record of the entire interest. See 37 CFR 3.71
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).

☒ attorney or agent of record.

☐ attorney or agent under 37 CFR 1.34(a).
Registration number if acting under 37 CFR 1.34(a). ______ .

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

February 8, 2002
Date

Signature
KIN-WAH TONG
Typed or printed name

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of ____ forms are submitted.

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)	Docket Number (Optional) SRI 1P037B

In re Application of HALVERSEN	
Application Number 09/608,872	Filed June 30, 2000
For Mobile Navigation of Network-Based Electronic Information Using Spoken Input	
Group Art Unit 2155	Examiner F. Backer

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a response in the above identified application.

The requested extension and appropriate non-small-entity fee are as follows (check time period desired):

- ☒ One month (37 CFR 1.17(a)(1)) $110.00
- ☐ Two months (37 CFR 1.17(a)(2)) $
- ☐ Three months (37 CFR 1.17(a)(3)) $
- ☐ Four months (37 CFR 1.17(a)(4)) $
- ☐ Five months (37 CFR 1.17(a)(5)) $

☒ Applicant claims small entity status. See 37 CFR 1.27. Therefore, the fee amount shown above is reduced by one-half, and the resulting fee is: $ 55.00 .

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Commissioner has already been authorized to charge fees in this application to a Deposit Account.

☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 20-0782 .
I have enclosed a duplicate copy of this sheet.

I am the ☐ applicant/inventor.

☐ assignee of record of the entire interest. See 37 CFR 3.71
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).

☒ attorney or agent of record.

☐ attorney or agent under 37 CFR 1.34(a).
Registration number if acting under 37 CFR 1.34(a). ______ .

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

February 8, 2002
Date

Signature

KIN-WAH TONG
Typed or printed name

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of ____ forms are submitted.

FEE TRANSMITTAL
for FY 2002

Patent fees are subject to annual revision.

TOTAL AMOUNT OF PAYMENT ($) 425

Complete If Known	
Application Number	09/608,872
Filing Date	June 30, 2000
First Named Inventor	Halversen
Examiner Name	F. Backer
Group / Art Unit	2165
Attorney Docket No.	SRI 1P037B

METHOD OF PAYMENT (check one)

1. ☒ The Commissioner is hereby authorized to charge indicated fees and credit any over payments to:

Deposit Account Number: 20-0782

Deposit Account Name:

☒ Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17

☒ Applicant claims small entity status. See 37 CFR 1.27

2. ☐ Payment Enclosed:

☐ Check ☐ Credit card ☐ Money Order ☐ Other

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
101	740	201	370	Utility filing fee	
106	330	206	165	Design filing fee	
107	510	207	255	Plant filing fee	
108	740	208	370	Reissue filing fee	
114	160	214	80	Provisional filing fee	

SUBTOTAL (1) ($) 0

2. EXTRA CLAIM FEES

			Extra Claims		Fee from below		Fee Paid
Total Claims		-20** =	0	X		=	0
Independent Claims		-3** =	0	X		=	0
Multiple Dependent				X		=	0

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description
103	18	203	9	Claims in excess of 20
102	84	202	42	Independent claims in excess of 3
104	280	204	140	Multiple dependent claim, if not paid
109	84	209	42	** Reissue independent claims over original patent
110	18	210	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) ($) 0

**or number previously paid, if greater; For Reissues, see above

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
105	130	205	65	Surcharge - late filing fee or oath	
127	50	227	25	Surcharge - late provisional filing fee or cover sheet.	
139	130	139	130	Non-English specification	
147	2,520	147	2,520	For filing a request for reexamination	
112	920*	112	920*	Requesting publication of SIR prior to Examiner action	
113	1,840*	113	1,840*	Requesting publication of SIR after Examiner action	
115	110	215	55	Extension for reply within first month	55.00
116	400	216	200	Extension for reply within second month	
117	920	217	460	Extension for reply within third month	
118	1,440	218	720	Extension for reply within fourth month	
128	1,960	228	980	Extension for reply within fifth month	
119	320	219	160	Notice of Appeal	
120	320	220	160	Filing a brief in support of an appeal	
121	280	221	140	Request for oral hearing	
138	1,510	138	1,510	Petition to institute a public use proceeding	
140	110	240	55	Petition to revive – unavoidable	
141	1,280	241	640	Petition to revive – unintentional	
142	1,280	242	640	Utility issue fee (or reissue)	
143	460	243	230	Design issue fee	
144	620	244	310	Plant issue fee	
122	130	122	130	Petitions to the Commissioner	
123	50	123	50	Processing fee under 37 CFR 1.17 (q)	
126	180	126	180	Submission of Information Disclosure Stmt	
581	40	581	40	Recording each patent assignment per property (times number of properties)	
146	740	246	370	Filing a submission after final rejection (37 CFR § 1.129(a))	
149	740	249	370	For each additional invention to be examined (37 CFR § 1.129(b))	
179	740	279	370	Request for Continued Examination (RCE)	370.00
169	900	169	900	Request for expedited examination of a design application	

Other fee (specify)

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) ($) 425

SUBMITTED BY				*Complete (if applicable)*	
Name (Print/Type)	KIN-WAH TONG	*Registration No. Attorney/Agent)*	39,400	*Telephone*	(732)530-9404
Signature	[signature]			*Date*	FEBRUARY 8, 2002

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Received from < 732 530 9808 > at 2/8/02 3:49:42 PM [Eastern Standard Time]

BEST COPY

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/608,872	06/30/2000	Christine Halversen	SRIIp037B	2382

7590 02/19/2002

THOMASON, MOSER & PATTERSON, LLP
595 SHREWSBURY AVENUE
SUITE 100
SHREWSBURY, NJ 07702

EXAMINER	
BACKER, FIRMIN	
ART UNIT	PAPER NUMBER
2155	19

DATE MAILED: 02/19/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

Office Action Summary	Application No.	Applicant(s)
	09/608,872	HALVERSEN ET AL.
	Examiner	Art Unit
	Firmin Backer	2155

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 February 2002* .

2a)☐ This action is **FINAL.** 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *56-82* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *56-82* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) ☐ Notice of References Cited (PTO-892)
16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
18) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
19) ☐ Notice of Informal Patent Application (PTO-152)
20) ☐ Other:

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 8th, 2002 has been entered.

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 56-82 are provisionally rejected under the judicially created doctrine of double patenting over claims 56-126 of copending Application No. 09/524,095. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows. Although the conflicting claims are not identical, they are not patentably distinct from each other because it would have been obvious to one of ordinary skill in the art to observed that the omission of the limitations "**soliciting additional input from the user, including user interaction in a modality different that the original request and, refining the navigation query, based upon the additional input**", of applicant claims 56-82 are already in the Co-pending application 09/524,095, as such they are obvious variation of the inventive concept defined in claims 56-126 of the Co-pending application 09/524,095. See In re Karlson, 136USPQ 184 (CCPA 1963). This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

5. Claims 56-82 are rejected under 35 U.S.C. 102(e) as being anticipated by Levin et al. (U.S. Patent No. 6,173,279).

6. As per claim 56, Levin et al teach a method for speech-based navigation (*information server, 110*) of an electronic data source located at one or more network servers located remotely from a user, wherein at least a portion of a data link between a mobile information appliance of the user and the one or more network servers utilizes wireless communication (*see abstract, fig*

1, column 3 lines 5-35), comprising receiving a spoken request (*receive a natural language query*) for desired information from the user (*user, 112*) utilizing the mobile information appliance (*PC, 102*) of the user; rendering an interpretation (*creating a semantic representation*) of the spoken request, constructing a navigation (*generating search)* query based upon the interpretation; utilizing the navigation query to select a portion of the electronic data source; and transmitting (*sending*) the selected portion of the electronic data source from the network server to the mobile information appliance of the user. (*see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22)*

7. As per claim 57, 58, 62-64, Levin et al teach a method of rendering the interpretation of the spoken request is performed at the one or more network servers by the mobile information appliance including a wireless telephone, a portable computer that is a personal digital assistance (*see abstract, fig 1, column 3 lines 5-35*).

8. As per claim 59, Levin et al teach a method of soliciting additional input from the user, including user interaction in a modality different than the original request; refining the navigation query, based upon the additional input; and using the refined navigation query to select a portion of the electronic data source (*see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22*).

9. As per claim 60, Levin et al teach a method wherein the data link includes a cellular telephone system (*see fig 1, column 2 line 61-67*).

10. As per claim 61, Levin et al teach a method wherein steps (a)-(d) are performed with respect to multiple users (*see abstract, fig 1, column 3 lines 5-35*).

11. As per claim 65, Levin et al teach a computer system for speech-based navigation (*information server, 110*) of an electronic data source located at one or more network servers located remotely from a user, wherein at least a portion of a data link between a mobile information appliance of the user and the one or more network servers utilizes wireless communication (*see abstract, fig 1, column 3 lines 5-35*), comprising a code segment receiving a spoken request (*receive a natural language query*) for desired information from the user (*user*) utilizing the mobile information appliance (*PC, 102*) of the user; a code segment rendering an interpretation (*creating a semantic representation*) of the spoken request, a code segment constructing a navigation (*generating search)* query based upon the interpretation; a code segment utilizing the navigation query to select a portion of the electronic data source; and a code segment transmitting the selected portion of the electronic data source from the network server to the mobile information appliance of the user. (*see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22*).

12. As per claim 66, 67, 71-73, Levin et al teach a system of rendering the interpretation of the spoken request is performed at the one or more network servers by the mobile information appliance including a wireless telephone, a portable computer that is a personal digital assistance (*see abstract, fig 1, column 3 lines 5-35*).

13. As per claim 68, Levin et al teach a system of soliciting additional input from the user, including user interaction in a modality different than the original request; refining the navigation query, based upon the additional input; and using the refined navigation query to select a portion of the electronic data source (*see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22*).

14. As per claim 69, Levin et al teach a system wherein the data link includes a cellular telephone system (*see fig 1, column 2 line 61-67*).

15. As per claim 70, Levin et al teach a system wherein steps (a)-(d) are performed with respect to multiple users (*see abstract, fig 1, column 3 lines 5-35*).

16. As per claim 74, Levin et al teach a system for speech-based navigation (*information server, 110*) of an electronic data source located at one or more network servers located remotely from a user, wherein at least a portion of a data link between a mobile information appliance of the user and the one or more network servers utilizes wireless communication (*see abstract, fig 1, column 3 lines 5-35*), comprising receiving a spoken request (*receive a natural language query*) for desired information from the user (*user*) utilizing the mobile information appliance (*PC, 102*) of the user; rendering an interpretation (*creating a semantic representation*) of the spoken request, constructing a navigation (*generating search)* query based upon the interpretation; utilizing the navigation query to select a portion of the electronic data source; and transmitting the selected portion of the electronic data source from the network server to the

mobile information appliance of the user. (*see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22*)

17. As per claim 75, 76, 80-81, Levin et al teach a method of rendering the interpretation of the spoken request is performed at the one or more network servers by the mobile information appliance including a wireless telephone, a portable computer that is a personal digital assistance (*see abstract, fig 1, column 3 lines 5-35*).

18. As per claim 77, Levin et al teach a system of soliciting additional input from the user, including user interaction in a modality different than the original request; refining the navigation query, based upon the additional input; and using the refined navigation query to select a portion of the electronic data source (*see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22*).

19. As per claim 78, Levin et al teach a system wherein the data link includes a cellular telephone system (*see fig 1, column 2 line 61-67*).

20. As per claim 79, Levin et al teach a system wherein steps (a)-(d) are performed with respect to multiple users (*see abstract, fig 1, column 3 lines 5-35*).

Response to Arguments

21. Applicant's arguments filed on September 26th, 2001 have been fully considered but they are not persuasive.

a. Applicant argues that the prior art "fails to teach or suggest the novel concept of speech-based navigation where the method receives spoken request for desired information from the user utilizing the mobile information appliance of the user and where in turn the selected electronic data source from the network server is transmitted to the mobile information appliance of the user." Examiner respectfully disagrees with the applicant perspective and characterization of Levin inventive concept. Levin teach that the URL for a data resource is inputted into PC 102 either by typing the request using a keyboard 104 or ***by speaking the request into a microphone 105,*** which is considered to be a mobile appliance of the user. Furthermore, Levin et al indicate that the spoken requests either from a PC microphone 105 or from a telephone 103 can be handled by a speech recognition system residing at the information server (*see column 4 lines 7-22*). Applicant further argues that the prior art "fails to teach or suggest that the selected electronic data source from the network server is transmitted to the mobile information appliance of the user." Examiner respectfully disagrees with the applicant perspective and characterization of Levin inventive concept. Levin teach that once an information server is accessed, the user can send a text or a spoken query requesting a particular action or service (step 204), for example: "call the pizza place on Main Street in Westfield". The query is received by the access server 106 and the natural language query is sent to the information server 110 via packet network 108. It is to be understood that the packet network 108 may be connected to a plurality of information servers which each relate to one or more particular information services, or there may be a single centralized information server 110 which is accessed by all information services which are capable of receiving and processing natural language queries and contains at least some of the data resources (e.g., URLs and associated site/service-specific grammars) *capable of receiving and responding to a natural language query*. It is obvious inventive concept referring to *response* is in the field of sending or transmitting the requested information to the user. Moreover, it is understood in the art of information request, in order to complete the transaction, the host must transmit to the requester the requested information.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Firmin Backer whose telephone number is 703-305-0624. The examiner can normally be reached on Mon-Thu 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sheikh Ayaz can be reached on 703-305-9648. The fax phone numbers for the organization where this application or proceeding is assigned are 703-746-7239 for regular communications and 703-746-7238 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Firmin Backer
February 14, 2002

AYAZ SHEIKH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

SERIAL NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKETT NO.

EXAMINER

ART UNIT	PAPER NUMBER
	20

DATE MAILED:

EXAMINER INTERVIEW SUMMARY RECORD

All participants (applicant, applicant's representative, PTO personnel):

(1) David Wiley (3)

(2) Kin-wah Tong 39,400 (4)

Date of Interview 5/23/2002

Type: ☐ Telephonic ☒ Personal (copy is given to ☐ applicant ☐ applicant's representative).

Exhibit shown or demonstration conducted: ☐ Yes ☒ No. If yes, brief description:

Agreement ☒ was reached with respect to some or all of the claims in question. ☐ was not reached.

Claims discussed: 56-82

Identification of prior art discussed: Levin et al.

Description of the general nature of what was agreed to if an agreement was reached, or any other comments: The applicant agreed to amend the claims to further identify the mobile device to overcome the Levin reference.

(A fuller description, if necessary, and a copy of the amendments, if available, which the examiner agreed would render the claims allowable must be attached. Also, where no copy of the amendments which would render the claims allowable is available, a summary thereof must be attached.)

☒ 1. It is not necessary for applicant to provide a separate record of the substance of the interview.

Unless the paragraph below has been checked to indicate to the contrary, A FORMAL WRITTEN RESPONSE TO THE LAST OFFICE ACTION IS NOT WAIVED AND MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW (e.g., items 1-7 on the reverse side of this form). If a response to the last Office action has already been filed, then applicant is given one month from this interview date to provide a statement of the substance of the interview.

☐ 2. Since the examiner's interview summary above (including any attachments) reflects a complete response to each of the objections, rejections and requirements that may be present in the last Office action, and since the claims are now allowable, this completed form is considered to fulfill the response requirements of the last Office action. Applicant is not relieved from providing a separate record of the substance of the interview unless box 1 above is also checked.

Examiner's Signature

PTOL-413 (REV. 2-93)

ORIGINAL FOR INSERTION IN RIGHT HAND FLAP OF FILE WRAPPER

TELEFAX COVER SHEET

MOSER, PATTERSON & SHERIDAN, LLP
ATTORNEYS AT LAW
595 SHREWSBURY AVENUE
FIRST FLOOR
SHREWSBURY, NJ 07702
TELEPHONE (732) 530-9404
TELEFAX (732) 530-9808

THIS MESSAGE HAS 13 PAGES INCLUDING THIS SHEET

TO: Assistant Commissioner of Patents

FAX NO.: 703-746-7239

FROM: Kin-Wah Tong

DATE: July 17, 2002

MATTER: Serial No. 09/608,872 Filed: June 30, 2000

DOCKET NO.: SRI 1P037B

APPLICANT: HALVERSON, et al

The following has been received in the U.S. Patent and Trademark Office on the date of this facsimile:

___ Petition
___ Disclosure Statement & PTO-1449
___ Priority Document
___ Drawings (____ sheets) informal
X Petition for Extension of Time (2 copies)
X Amendment and Response

X Transmittal Letter
___ Fee Transmittal (2 copies)
X Deposit Account Transaction
X Facsimile Transmission Certificate dated July 17, 2002

CERTIFICATE OF TRANSMISSION UNDER 37 C.F.R. §1.8

I hereby certify that this correspondence is being transmitted by facsimile to the Assistant Commissioner for Patents, Box Non-Fee Amendment, Washington, DC 20231 on July 17, 2002. Facsimile No. 703-746-7239.

Linda DeNardi
Name of person signing this certificate

Linda DeNardi July 17, 2002
Signature and date

D

Official

PTO/SB/21 (08-00)

Please type a plus sign (+) inside this box → [+]

Approved for use through 10/31/2002. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TRANSMITTAL FORM *(to be used for all correspondence after initial filing)*		Application Number	09/608,872
		Filing Date	June 30, 2000
		First Named Inventor	HALVERSON
		Group Art Unit	2155
		Examiner Name	F. BACKER
Total Number of Pages in This Submission	13	Attorney Docket Number	SRI 1 P 037B

ENCLOSURES *(check all that apply)*

☐ Fee Transmittal Form	☐ Assignment Papers *(for an Application)*	☐ After Allowance Communication to Group
☐ Fee Attached	☐ Drawing(s)	☐ Appeal Communication to Board of Appeals and Interferences
☒ Amendment / Response	☐ Licensing-related Papers	☐ Appeal Communication to Group *(Appeal Notice, Brief, Reply Brief)*
☐ After Final	☐ Petition	☐ Proprietary Information
☐ Affidavits/declaration(s)	☐ Petition to Convert to a Provisional Application	☐ Status Letter
☒ Extension of Time Request	☐ Power of Attorney, Revocation Change of Correspondence Address	☐ Other Enclosure(s) *(please identify below)*: Certificate of Facsimile Transmission
☐ Express Abandonment Request	☐ Terminal Disclaimer	
☐ Information Disclosure Statement	☐ Request for Refund	
☐ Certified Copy of Priority Document(s)	☐ CD, Number of CD(s)	
☐ Response to Missing Parts/ Incomplete Application	Remarks	
☐ Response to Missing Parts under 37 CFR 1.52 or 1.53		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	KIN-WAH TONG, ESQ., Reg. No. 39,400
Signature	K W Tong
Date	July 17, 2002

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PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)	Docket Number (Optional) SRI 1P037B

In re Application of	Halverson, et al
Application Number 09/608,872	Filed June 30, 2000
For	Mobile Navigation of Network-Based Electronic Information Using Spoken Output
Group Art Unit 2155	Examiner F. Backer

#21
S. Collins,
7/18/02

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a response in the above identified application.

The requested extension and appropriate non-small-entity fee are as follows (check time period desired):

- ☐ One month (37 CFR 1.17(a)(1)) $
- ☒ Two months (37 CFR 1.17(a)(2)) $400.00
- ☐ Three months (37 CFR 1.17(a)(3)) $
- ☐ Four months (37 CFR 1.17(a)(4)) $
- ☐ Five months (37 CFR 1.17(a)(5)) $

☒ Applicant claims small entity status. See 37 CFR 1.27. Therefore, the fee amount shown above is reduced by one-half, and the resulting fee is: $ 200.00 .

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Commissioner has already been authorized to charge fees in this application to a Deposit Account.

☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 20-0782 . I have enclosed a duplicate copy of this sheet.

I am the ☐ applicant/inventor.

☐ assignee of record of the entire interest. See 37 CFR 3.71
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).

☒ attorney or agent of record.

☐ attorney or agent under 37 CFR 1.34(a).
Registration number if acting under 37 CFR 1.34(a). ______

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

July 17, 2002
Date

Signature
Kin-Wah Tong
Typed or printed name

07/19/2002 SCOTTON 00000002 200782 09608872
01 FC:116 400.00 CH

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of _____ forms are submitted.

09/608,872

IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE

PATENT APPLICATION

#22/D
S. Carlton
7-18-02

Applicant: **Halverson et al.**

Case:. **SRI1P037B**

Serial No.: **09/608,872** Filed: **June 30, 2000**

Group Art Unit: **2155**

Examiner: **Firmin Backer**

Title: **MOBILE NAVIGATION OF NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN INPUT**

ASSISTANT COMMISSIONER FOR PATENTS
Box Non-Fee Amendment
Washington, D. C. 20231

S I R:

AMENDMENT AND RESPONSE UNDER 37 C.F.R. § 1.111

This amendment addresses the Office Action dated February 19, 2002 (Paper No. 19).

IN THE CLAIMS

Please amend claims 56, 65 and 74 as shown below. These claims are "clean version" of the amended claims, i.e., with changes incorporated into the claims, whereas the Appendix to this Amendment illustrates the amended claims using underlines and brackets to indicate addition and deletion, respectively.

X01

~~56.~~ (Twice Amended) A method for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, wherein a data link is established between a mobile information appliance of the user and the one or more network servers, comprising the steps of:

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09/608,872

(a) receiving a spoken request for desired information from the user utilizing the mobile information appliance of the user, wherein said mobile information appliance comprises a portable remote control device or a set-top box for a television;

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(b) rendering an interpretation of the spoken request;

(c) constructing a navigation query based upon the interpretation;

(d) utilizing the navigation query to select a portion of the electronic data source; and

(e) transmitting the selected portion of the electronic data source from the network server to the mobile information appliance of the user.

10 ~~85~~. (Twice Amended) A computer program embodied on a computer readable medium for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, wherein a data link is established between a mobile information appliance of the user and the one or more network servers, comprising:

(a) a code segment that receives a spoken request for desired information from the user utilizing the mobile information appliance of the user, wherein said mobile information appliance comprises a portable remote control device or a set-top box for a television;

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(b) a code segment that renders an interpretation of the spoken request;

(c) a code segment that constructs a navigation query based upon the interpretation;

(d) a code segment that utilizes the navigation query to select a portion of the electronic data source; and

(e) a code segment that transmits the selected portion of the electronic data source from the network server to the mobile information appliance of the user.

19 ~~74~~. (Amended) A system for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, comprising:

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(a) a mobile information appliance operable to receive a spoken request for desired information from the user, wherein said mobile information appliance comprises

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a portable remote control device or a set-top box for a television;

(b) spoken language processing logic, operable to render an interpretation of the spoken request;

(c) query construction logic, operable to construct a navigation query based upon the interpretation;

(d) navigation logic, operable to select a portion of the electronic data source using the navigation query, and

(e) electronic communications infrastructure for transmitting the selected portion of the electronic data source from the network server to the mobile information appliance of the user.

REMARKS

Applicants' representative would like to thank Primary Examiner David Wiley for kindly taking a substantial amount of time on May 23, 2002 to discuss the merits of the subject invention in a face-to-face Examiner Interview. Applicants' representative is aware of the time constraint that is placed on the Examiner and is appreciative of the Examiner's willingness to devote such large quantity of time to discuss the case on the merit.

In view of the following discussion, the Applicants submit that none of the claims now pending in the application are anticipated under the provisions of 35 U.S.C. § 102. Thus, the Applicants believe that all of these claims are now in allowable form.

I. REJECTION OF CLAIMS 56-82 UNDER DOUBLE PATENTING

The Examiner provisionally rejected claims 56-82 in Paragraphs 2-3 of the Office Action based on the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 56-126 of copending Application No. 09/524,095.

Responsive to the Examiner, Applicants provisionally agree to file a terminal disclaimer to resolve the present judicially created doctrine of obviousness-type double patenting rejection if and when one of the applications is finally allowed. In accordance with MPEP 804 I.B, "if the 'provisional' double patenting rejection in one application is

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the only rejection remaining in that application, the examiner should then withdraw that rejection and permit the application to issue as a patent, thereby converting the 'provisional' doubling patenting rejection in the other application(s) into a double patenting rejection at the time the one application issues as a patent". As such, Applicants will file a terminal disclaimer in the future, if necessary.

II. REJECTION OF CLAIMS 56-82 UNDER 35 U.S.C. § 102

The Examiner has again rejected claims 56-82 in Paragraphs 4-20 of the Office Action as being anticipated by the Levin et al. patent (US Patent 6,173,279 issued January 9, 2001, hereinafter referred to as Levin). The rejection is respectfully traversed.

Levin teaches "a method of using at least one natural language query to retrieve information from one or more data resources and further performing a requested action using the retrieved information is disclosed". (See Levin, Column 2, lines 15-18) Namely, Levin teaches a method for using natural language query to obtain information, where upon receipt of the requested information, a desired action is executed based upon the requested information. To illustrate, Levin provides the example, where a user employs natural language to request the telephone number of a restaurant. Upon receipt of the telephone number, the telephone number is actually dialed for the user. (See Levin, Column 3 line 62 to Column 4, line 1)

In contrast, Levin fails to teach or suggest the novel concept of speech-based navigation where the method receives spoken request for desired information from the user utilizing the mobile information appliance of the user, wherein said mobile information appliance comprises a portable remote control device or a set-top box for a television. Specifically, Applicants' independent claims 56, 65 and 74 positively recite:

> 56. A method for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, wherein a data link is established between a mobile information appliance of the user and the one or more network servers, comprising the steps of:
>
> (a) receiving a spoken request for desired information from the user utilizing the mobile information appliance of the user, wherein said mobile

information appliance comprises a portable remote control device or a set-top box for a television;

(b) rendering an interpretation of the spoken request;

(c) constructing a navigation query based upon the interpretation;

(d)utilizing the navigation query to select a portion of the electronic data source; and

(e) transmitting the selected portion of the electronic data source from the network server to the mobile information appliance of the user. (emphasis added)

65. A computer program embodied on a computer readable medium for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, wherein a data link is established between a mobile information appliance of the user and the one or more network servers, comprising:

(a) a code segment that receives a spoken request for desired information from the user utilizing the mobile information appliance of the user, wherein said mobile information appliance comprises a portable remote control device or a set-top box for a television;

(b) a code segment that renders an interpretation of the spoken request;

(c) a code segment that constructs a navigation query based upon the interpretation;

(d) a code segment that utilizes the navigation query to select a portion of the electronic data source; and

(e) a code segment that transmits the selected portion of the electronic data source from the network server to the mobile information appliance of the user. (emphasis added)

74. A system for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, comprising:

(a) a mobile information appliance operable to receive a spoken request for desired information from the user, wherein said mobile information appliance comprises a portable remote control device or a set-top box for a television;

(b) spoken language processing logic, operable to render an interpretation of the spoken request;

(c) query construction logic, operable to construct a navigation query based upon the interpretation;

(d) navigation logic, operable to select a portion of the electronic data source using the navigation query, and

(e) electronic communications infrastructure for transmitting the selected portion of the electronic data source from the network server to the mobile information appliance of the user. (emphasis added)

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Applicants' invention teaches a novel method and apparatus for speech-based navigation where the method receives spoken request for desired information from the user utilizing the mobile information appliance of the user, wherein said mobile information appliance comprises a portable remote control device or a set-top box for a television. This teaching is completely absent in the Levin reference.

During the Examiner Interview, Primary Examiner David Wiley indicated that a specific identification of the mobile information appliance that comprises a portable remote control device or a set-top box for a television would likely overcome the Levin reference.

Therefore, the Applicants respectfully submit that independent claims 56, 65 and 74 are not anticipated by the Levin reference. As such, claims 56, 65 and 74 fully satisfy the requirements of 35 U.S.C. §102 and are patentable thereunder.

Claims 57-64, 66-73 and 75-82 depend, either directly or indirectly, from claims 56, 65 and 74 and recite additional features therefor. Since Levin fails to anticipate Applicants' invention as recited in Applicants' independent claims 56, 65 and 74, dependent claims 57-64, 66-73 and 75-82 are also not anticipated under 35 U.S.C. § 102 and are allowable for the same reason noted above.

Conclusion

Thus, the Applicants submit that all of these claims now fully satisfy the requirements of 35 U.S.C. §102. Consequently, the Applicants believe that all these claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues requiring the issuance of a final action in any of the claims now pending in the application, it is requested that the Examiner telephone Mr. Kin-Wah Tong, Esq. at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

09/608,872

Respectfully submitted,

7/17/02

Kin-Wah Tong, Attorney
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(732) 530-9404

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595 Shrewsbury Avenue
First Floor,
Shrewsbury, New Jersey 07702

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Appendix
(Marked-up copy of amended claims)

56. (Twice Amended) A method for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, wherein a data link is established between a mobile information appliance of the user and the one or more network servers, comprising the steps of:

(a) receiving a spoken request for desired information from the user utilizing the mobile information appliance of the user, wherein said mobile information appliance comprises a portable remote control device or a set-top box for a television;

(b) rendering an interpretation of the spoken request;

(c) constructing a navigation query based upon the interpretation;

(d)utilizing the navigation query to select a portion of the electronic data source; and

(e) transmitting the selected portion of the electronic data source from the network server to the mobile information appliance of the user[, wherein at least a portion of said data link between said mobile information appliance of the user and the one or more network servers utilizes wireless communication].

65. (Twice Amended) A computer program embodied on a computer readable medium for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, wherein a data link is established between a mobile information appliance of the user and the one or more network servers, comprising:

(a) a code segment that receives a spoken request for desired information from the user utilizing the mobile information appliance of the user, wherein said mobile information appliance comprises a portable remote control device or a set-top box for a television;

(b) a code segment that renders an interpretation of the spoken request.

(c) a code segment that constructs a navigation query based upon the interpretation;

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(d) a code segment that utilizes the navigation query to select a portion of the electronic data source; and

(e) a code segment that transmits the selected portion of the electronic data source from the network server to the mobile information appliance of the user[, wherein at least a portion of said data link between said mobile information appliance of the user and the one or more network servers utilizes wireless communication].

74. (Amended) A system for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, comprising:

(a) a mobile information appliance operable to receive a spoken request for desired information from the user, wherein said mobile information appliance comprises a portable remote control device or a set-top box for a television;

(b) spoken language processing logic, operable to render an interpretation of the spoken request;

(c) query construction logic, operable to construct a navigation query based upon the interpretation;

(d) navigation logic, operable to select a portion of the electronic data source using the navigation query, and

(e) electronic communications infrastructure for transmitting the selected portion of the electronic data source from the network server to the mobile information appliance of the user[, wherein at least a portion of a data link of the electronic communications infrastructure between a mobile information appliance of the user and the one or more network servers utilizes wireless communication].

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2155

COPY OF PAPERS ORIGINALLY FILED

TRANSMITTAL OF INFORMATION DISCLOSURE STATEMENT Under 37 CFR 1.97(b), (c), or (d)			Docket No. SRI1P037B
In re Application of: Halverson, et al.			
Serial No. 09/608,872	Filing Date June 30, 2000	Examiner Firmin Backer	Group Art Unit 2155
Title: MOBILE NAVIGATION OF NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN INPUT			

OIPE JC185 JUL 2 9 2002 PATENT & TRADEMARK OFFICE

Address to:
Assistant Commissioner for Patents
Washington, D.C. 20231

RECEIVED JUL 3 1 2002 Technology Center 2100

37 CFR 1.97(b)

1. ☐ The Information Disclosure Statement submitted herewith is being filed within three months of the filing of a national application other than a continued prosecution application under 37 CFR 1.53(d); within three months of the date of entry of the national stage as set forth in 37 CFR 1.491 in an international application; before the mailing of a first Office Action on the merits; or before the mailing of a first Office Action after the filing of a request for continued examination under 37 CFR 1.114.

37 CFR 1.97(c)

2. X The Information Disclosure Statement submitted herewith is being filed after the period specified in 37 CFR 1.97(b), but prior to the mailing date of a Final Action under 37 CFR 1.113, a Notice of Allowance under 37 CFR 1.311, or an Action that otherwise closes prosecution in the application, and is accompanied by the statement or fee as indicated below.

37 CFR 1.97(d)

3. ☐ The Information Disclosure Statement submitted herewith is being filed after the period specified in 37 CFR 1.97(c), but on or before payment of the issue fee and is accompanied by the statement and fee as indicated below.

Required Statements and/or Fees Under 37 CFR 1.97(c) or (d)

X Each item of information contained in the accompanying Information Disclosure Statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the Information Disclosure Statement. (37 CFR 1.97(e)(1))

☐ No item of information in the accompanying Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned person, after making reasonable inquiry, no item of information contained in the accompanying Information Disclosure Statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the Information Disclosure Statement. (37 CFR 1.97(e)(2))

☐ The fee set forth in 37 CFR 1.17(p). Please credit any overpayment or charge any insufficiencies to deposit account number 20-0782.

37 CFR §1.704(d)

4. X Each item of information in the accompanying Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart application and this communication was not received by any individual designated in 37 CFR §1.56(c) more than thirty days prior to the filing of the Information Disclosure Statement.

Dated: July 23 2002

Kin-Wah Tong, Attorney
Reg. No. 39,400

Moser, Patterson & Sheridan, LLP
Attorneys at Law
595 Shrewsbury Avenue, Suite 100
Shrewsbury, New Jersey 07702
732-530-9404

Certificate of Mailing by First Class Mail

I certify that this document is being deposited on **July 23, 2002** with the U.S. Postal Service as first class mail under 37 CFR §1.8 and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231

Barbara Jacka
Signature of Person Mailing Correspondence

Barbara J. Jackson
Typed or Printed Name of Person Mailing Correspondence

Sheet 1 of 1 sheet(s)

U.S. Department of Commerce, Patent and Trademark Office	Docket No.	Serial No.
(PTO Form 1449 modified)	SRI1P037B	09/608,872
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Applicant Halversen, et al. #23	Confirmation No.: 2382
(Use several sheets if necessary)	Filing Date	Group
Examiner Firmin Backer	June 30, 2000	2155

OIPE JC156 JUL 29 2002 PATENT & TRADEMARK OFFICE

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U.S. Patent Documents

*Examiner Initial		Document Number	Issue Date	Applicant(s) Name	Class	Subclass	Filing Date If Appropriate
FJ	A1	6,016,476	01/18/2000	Maes, et al.	705	1	
	A2						
	A3						
	A4						
	A5						
	A6						
	A7						
	A8						
	A9						
	A10						
	A11						
	A12						
	A13						

Foreign Patent Documents

*Examiner Initial		Document Number	Date	Country	Class	Subclass	Translation YES	Translation NO
FJ	B1	0 867 861	09/30/1998	EPO	G10L	5/06	☐	☐
FJ	B2	99/50826	10/07/1999	WIPO	G10L	3/00	☐	☐
FJ	B3	00/05638	02/03/2000	WIPO	G06F	—	☐	☐
	B4						☐	☐
	B5						☐	☐

OTHER ART

*Examiner Initial		Including Author, Title, Date, Pertinent Pages, Etc.
FJ	C1	International Search Report, Intl Appl No. PCT/US01/07987
	C2	
	C3	

Examiner *[signature]*	Date Considered 9/27/02

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with your communication to applicant.

Other Prior Art

According to the information contained in form PTO-1449 or PTO-892, there are one or more other prior art/non-patent literature documents missing from the original file history record obtained from the United States Patent and Trademark Office. Upon your request we will attempt to obtain these documents from alternative resources. Please note that additional charges will apply for this service.

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UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/608,872	06/30/2000	Christine Halversen	SRIlp037B	2382

7590 10/04/2002

THOMASON, MOSER & PATTERSON, LLP
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EXAMINER	
JEAN, FRANTZ B	
ART UNIT	**PAPER NUMBER**
2155	24

DATE MAILED: 10/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

Office Action Summary	Application No.	Applicant(s)
	09/608,872	HALVERSEN ET AL.
	Examiner	Art Unit
	Frantz B. Jean	2155

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 7/29/2002.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 56-82 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 56-82 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7,23.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

1. This office action is in response to an amendment received on 7/18/02. Claims 56, 65 and 74 were amended. Claims 56-82 are still pending in this application.

Information Disclosure Statement

2. The IDS received on 7/29/02 have been considered.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 56-82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Levin et al. (U.S. Patent No. 6,173,279) in view of Bailey, III US patent No. 6,353,66.

5. As per claim 56, Levin et al teach a method for speech-based navigation (information server, 110) of an electronic data source located at one or more network servers located remotely from a user, wherein at least a portion of a data link between a mobile information appliance of the user and the one or more network servers utilizes wireless communication (see abstract, fig 1, column 3 lines 5-35), comprising receiving a request (receive a natural language query) for desired information from the user (user, 112) utilizing the mobile appliance (PC, 102) of the user

wherein said mobile information comprises a portable remote control device or top-box for a television; rendering an interpretation (creating a semantic representation) of the request, constructing a navigation (generating search) query based upon the interpretation; utilizing the navigation query to select a portion of the electronic data source; and transmitting (sending) the selected portion of the electronic data source from the network server to the mobile information appliance of the user. (see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22). Although Levin teaches natural language, Levin does not explicitly elaborate on a spoken request for desired information from a user. Bailey III is directed to a network and communication access system which includes a spoken (audible) request for desired information from a user (col. 9 lines 47 et seq; col. 3 lines 21 et seq). It would have been obvious to one of ordinary skill in the art at the time of the invention to have combined Bailey's, III features to Levin's because they would have speeded up the communication process while providing a secure system (see Bailey, III col. 4 lines 41 et seq).

6. As per claims 57, 58, 62-64, Levin et al teach a method of rendering the interpretation of the request is performed at the one or more network servers by the mobile information appliance including a Wireless telephone, a portable computer that is a personal digital assistance (See abstract, fig 1, column 3 lines 5-35).

7. As per claim 59, Levin et al teach a method of soliciting additional input from the user, including user interaction in a modality different than the original request; refining the navigation query, based upon the additional input; and using the refined navigation query to select a portion of the electronic data source (see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22).

8. As per claim 60, Levin et al teach a method wherein the data link includes a cellular telephone system (see fig 1, column 2 line 61-67).

9. As per claim 61, Levin et al teach a method wherein steps (a)-(d) are performed with respect to multiple users (see abstract, fig 1, column 3 lines 5-35).

10. As per claim 65, Levin et al teach a computer system for speech-based navigation (information server, 110) of an electronic data source located at one or more network servers located remotely from a user, wherein at least a portion of a data link between a mobile information appliance of the user and the one or more network servers utilizes wireless communication (see abstract, fig 1, column 3 lines 5-35), comprising a code segment receiving a request (receive a natural language query) for desired information from the user (user) utilizing the mobile information appliance (PC, 102) of the user- a code segment rendering an interpretation (creating a semantic representation) of the request, a code segment constructing a navigation (generating search) query based upon the interpretation; a code segment utilizing the

navigation query to select a portion of the electronic data source; and a code segment transmitting the selected portion of the electronic data source from the network server to the mobile information appliance of the user. (see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22). Although Levin teaches natural language, Levin does not explicitly elaborate on a spoken request for desired information from a user. Bailey III is directed to a network and communication access system which includes a spoken (audible) request for desired information from a user (col. 9 lines 47 et seq; col. 3 lines 21 et seq). It would have been obvious to one of ordinary skill in the art at the time of the invention to have combined Bailey's, III features to Levin's because they would have speeded up the communication process while providing a secure system (see Bailey, III col. 4 lines 41 et seq).

11. As per claims 66, 67, 71-73, Levin et al teach a system of rendering the interpretation of the request is performed at the one or more network servers by the mobile information appliance including a wireless telephone, a portable computer that is a personal digital assistance (see abstract, fig 1, column 3 lines 5-35).

12. As per claim 68, Levin et at teach a system of soliciting additional input from the user, including user interaction in a modality different than the original request; refining the navigation query, based upon the additional input; and using the refined navigation query to select a portion

of the electronic data source (see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22).

13. As per claim 69, Levin et al teach a system wherein the data link includes a cellular telephone system (see fig 1, column 2 line 61-67).

14. As per claim 70, Levin et a] teach a system wherein steps (a)-(d) are performed with respect to multiple users (see abstract, fig 1, column 3 lines 5-35).

15. As per claim 74, Levin et at teach a system for speech-based navigation (information server, 110) of an electronic data source located at one or more network servers located remotely from a user, wherein at least a portion of a data link between a mobile information appliance of the user and the one or more network servers utilizes wireless communication (see abstract, fig 1, column 3 lines 5-35), comprising receiving a request (receive a natural language query) for desired information from the user (user) utilizing the mobile information appliance (PC, 102) of the user; rendering an interpretation (creating a semantic representation) of the request, constructing a navigation (generating search) query based upon the interpretation; utilizing the navigation query to select a portion of the electronic data source; and transmitting the selected portion of the electronic data source from the network server to the mobile information appliance of the user. (see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22). Although

Levin teaches natural language, Levin does not explicitly elaborate on a spoken request for desired information from a user. Bailey III is directed to a network and communication access system which includes a spoken (audible) request for desired information from a user (col. 9 lines 47 et seq; col. 3 lines 21 et seq). It would have been obvious to one of ordinary skill in the art at the time of the invention to have combined Bailey's, III features to Levin's because they would have speeded up the communication process while providing a secure system (see Bailey, III col. 4 lines 41 et seq).

16. As per claims 75, 76, 80-8 1, Levin et al teach a method of rendering the interpretation of a request that is performed at the one or more network servers by the mobile information appliance including a wireless telephone, a portable computer that is a personal digital assistance (see abstract, fig 1, column 3 lines 5-35).

17. As per claim 77, Levin et al teach a system of soliciting additional input from the user, including user interaction in a modality different than the original request; refining the navigation query, based upon the additional input; and using the refined navigation query to select a portion of the electronic data source (see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22).

18. As per claim 78, Levin et al teach a system wherein the data link includes a cellular telephone system (see fig 1, column 2 line 61-67).

19. As per claim 79, Levin et al teach a system wherein steps (a)-(d) are performed with respect to multiple users (see abstract, fig 1, column 3 lines 5-35).

Response to Arguments

20. Applicant's arguments filed on....7/18/02......have been fully considered but they are not persuasive. a. Applicant argues that the prior art "falls to teach or suggest the novel concept of speech-based navigation where the method receives spoken request for desired information from the user utilizing the mobile information appliance of the user and where in turn the selected electronic data source from the network server is transmitted to the mobile information appliance of the user." Examiner respectfully disagrees with the applicant perspective and characterization of Levin inventive concept. Levin teach that the URL for a data resource is inputted into PC 102 either by typing the request using a keyboard 104 or by speaking the request into a microphone 105, which is considered to be a mobile appliance of the user. Furthermore, Levin et al indicate that the spoken requests either from a PC microphone 105 or from a telephone 103 can be handled by a speech recognition system residing at the information server (see column 4 lines 7-22). Applicant further argues that the prior art "falls to teach or suggest that the selected electronic data source from the network server is transmitted to the mobile information appliance of the user." Examiner respectfully disagrees with the applicant perspective and characterization of Levin inventive concept. Levin teach that once an information server is accessed, the user can

send a text or a spoken query requesting a particular action or service (step 204), for example: "call the pizza place on Main Street in Westfield". The query is received by the access server 106 and the natural language query is sent to the information server I 10 via packet network 108. It is to be understood that the packet network 108 may be connected to a plurality of information servers which each relate to one or more particular information services, or there may be a single centralized information server 110 which is accessed by all information services which are capable of receiving and processing natural language queries and contains at least some of the data resources (e.g., URLs and associated site/service-specific grammars) capable of receiving and responding to a natural language query. It is obvious inventive concept referring to response is in the field of sending or transmitting the requested information to the user. Moreover, it is understood in the art of information request, in order to complete the transaction, the host must transmit to the requester the requested information.

21. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frantz B. Jean whose telephone number is (703) 305-3970. The examiner can normally be reached on Monday thru Friday from 8:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ayaz R. Sheikh, can be reached on (703) 305-9648. The fax phone numbers for this Group are

(703) 746-7238 for After-Final, (703) 746-7239 for Official, and (703) 746-7240 for Non-Official/Draft.

Communications via Internet e-mail regarding this application, other than those under 35 U.S.C. 132 or which otherwise require a signature, may be used by the applicant and should be addressed to [**Ayaz.Sheikh@uspto.gov**].

All Internet e-mail communications will be made of record in the application file. PTO employees do not engage in Internet communications where there exists a possibility that sensitive information could be identified or exchanged unless the record includes a properly signed express waiver of the confidentiality requirements of 35 U.S.C. 122. This is more clearly set forth in the Interim Internet Usage Policy published in the Official Gazette of the Patent and Trademark on February 25, 1997 at 1195 OG 89.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305-3900.

Frantz B. Jean
September 29, 2002
FBJ/

Notice of References Cited	Application/Control No. 09/608,872	Applicant(s)/Patent Under Reexamination HALVERSEN ET AL.	
	Examiner Frantz B. Jean	Art Unit 2155	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-6,317,684 B1	11-2001	Roeseler et al.	340/990
*	B	US-6,349,257 B1	02-2002	Liu et al.	340/5.6
*	C	US-6,314,365 B1	11-2001	Smith, Nicholas E.	340/988
	D	US-6,353,661 B1	03-2002	Bailey, III, John Edson	379/88.17
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

TELEFAX COVER SHEET

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THIS MESSAGE HAS 9 PAGES INCLUDING THIS SHEET

TO: Commissioner of Patents

FAX NO.: 703-746-7239

FROM: Kin-Wah Tong

DATE: January 6, 2003

MATTER: Serial No. 09/608,872 Filed: June 30, 2000

DOCKET NO.: SRI 1P037B

APPLICANT: HALVERSON, et al

The following has been received in the U.S. Patent and Trademark Office on the date of this facsimile:

___ Petition
___ Disclosure Statement & PTO-1449
___ Priority Document
___ Drawings (____ sheets) informal
___ Petition for Extension of Time (2 copies)
X Response
X Transmittal Letter (2 copies)
___ Fee Transmittal (2 copies)
___ Deposit Account Transaction
X Facsimile Transmission Certificate dated January 6, 2003

CERTIFICATE OF TRANSMISSION UNDER 37 C.F.R. §1.8

I hereby certify that this correspondence is being transmitted by facsimile to the Commissioner for Patents, Box Non-Fee Amendment, Washington, DC 20231 on **January 6, 2003** , Facsimile No. 703-746-7239 .

Kin-Wah Tong
Name of person signing this certificate

January 6, 2003
Signature and date

PTO/SB/21 (08-00)

Please type a plus sign (+) inside this box ⟶ [+]

Approved for use through 10/31/2002. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	09/608,872
Filing Date	June 30, 2000
First Named Inventor	HALVERSON
Group Art Unit	2155
Examiner Name	FRANTZ JEAN
Attorney Docket Number	SRI 1 P 037B

Total Number of Pages in This Submission

ENCLOSURES *(check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☒ Amendment / Response
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Response to Missing Parts/ Incomplete Application
  - ☐ Response to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Assignment Papers *(for an Application)*
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s) ____
- ☐ After Allowance Communication to Group
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☐ Appeal Communication to Group *(Appeal Notice, Brief, Reply Brief)*
- ☐ Proprietary Information
- ☐ Status Letter
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SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm *or* Individual name	KIN-WAH TONG, ESQ., Reg. No. 39,400
Signature	K. W. Tong
Date	January 6, 2003

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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	09/608,872
Filing Date	June 30, 2000
First Named Inventor	HALVERSON
Group Art Unit	2155
Examiner Name	FRANTZ JEAN
Attorney Docket Number	SRI 1 P 037B
Total Number of Pages in This Submission	

ENCLOSURES *(check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☒ Amendment / Response
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Response to Missing Parts/ Incomplete Application
  - ☐ Response to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Assignment Papers *(for an Application)*
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
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- ☐ CD, Number of CD(s) _____
- ☐ After Allowance Communication to Group
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☐ Appeal Communication to Group *(Appeal Notice, Brief, Reply Brief)*
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Remarks: **It is believed no fee is due. However, in the event a fee is due, kindly charge that fee to deposit account number 20-0782. To facilitate that charge, a duplicate copy of this letter is enclosed**

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	KIN-WAH TONG, ESQ., Reg. No. 39,400
Signature	K. W. Tong
Date	January 6, 2003

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#25

IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE

PATENT APPLICATION

Applicant: **Halverson et al.**

Case: **SRI1P037B**

Serial No.: **09/608,872** Filed: **June 30, 2000**

Group Art Unit: **2155**

Examiner: **Frantz Jean**

Title: **MOBILE NAVIGATION OF NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN INPUT**

ASSISTANT COMMISSIONER FOR PATENTS
Box Non-Fee Amendment
Washington, D. C. 20231

S I R:

RESPONSE UNDER 37 C.F.R. § 1.111

This response addresses the Office Action dated October 4, 2002 (Paper No. 24).

REMARKS

Applicants' representative would like to thank Primary Examiner Frantz Jean for kindly taking a substantial amount of time on December 23, 2002 to discuss the merits of the subject invention in a face-to-face Examiner Interview. Applicants' representative is aware of the time constraint that is placed on the Examiner and is appreciative of the Examiner's willingness to devote such large quantity of time to discuss the case on the merit.

In view of the following discussion, the Applicants submit that none of the claims now pending in the application are made obvious under the provisions of 35 U.S.C. § 103. Thus, the Applicants believe that all of these claims are now in allowable form.

I. REJECTION OF CLAIMS 56-82 UNDER 35 U.S.C. § 103

The Examiner rejected claims 56-82 in Paragraphs 4-19 of the Office Action as being unpatentable over Levin et al. patent (US Patent 6,173,279 issued January 9, 2001, hereinafter referred to as Levin) in view of Bailey III (US Patent 6,353,661 issued March 5, 2002, hereinafter referred to as Bailey). The rejection is respectfully traversed.

Levin teaches "a method of using at least one natural language query to retrieve information from one or more data resources and further performing a requested action using the retrieved information is disclosed". (See Levin, Column 2, lines 15-18). Namely, Levin teaches a method for using natural language query to obtain information, where upon receipt of the requested information, a desired action is executed based upon the requested information. To illustrate, Levin provides the example, where a user employs natural language to request the telephone number of a restaurant. Upon receipt of the telephone number, the telephone number is actually dialed for the user. (See Levin, Column 3 line 62 to Column 4, line 1)

Bailey teaches a system for using a telephone to interact with a remote system. Specifically, Bailey teaches the use of a conventional phone to allow users to browse, search, store, and create information stored on the Internet. (See Bailey, Abstract; Column 3, lines 8-39)

In contrast, the alleged combination of Levin and Bailey (either singly or in any permissible combination) fails to teach or suggest the novel concept of speech-based navigation where the method receives spoken request for desired information from the user utilizing the mobile information appliance of the user, wherein said mobile information appliance comprises a portable remote control device or a set-top box for a television. Specifically, Applicants' independent claims 56, 65 and 74 positively recite:

56. A method for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, wherein a data link is established between a mobile information appliance of the user and the one or more network servers, comprising the steps of:

(a) receiving a spoken request for desired information from the user utilizing the mobile information appliance of the user, wherein said mobile information appliance comprises a portable remote control device or a set-top box for a television;

(b) rendering an interpretation of the spoken request;

(c) constructing a navigation query based upon the interpretation;

(d)utilizing the navigation query to select a portion of the electronic data source; and

(e) transmitting the selected portion of the electronic data source from the network server to the mobile information appliance of the user. (emphasis added)

65. A computer program embodied on a computer readable medium for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, wherein a data link is established between a mobile information appliance of the user and the one or more network servers, comprising:

(a) a code segment that receives a spoken request for desired information from the user utilizing the mobile information appliance of the user, wherein said mobile information appliance comprises a portable remote control device or a set-top box for a television;

(b) a code segment that renders an interpretation of the spoken request;

(c) a code segment that constructs a navigation query based upon the interpretation;

(d) a code segment that utilizes the navigation query to select a portion of the electronic data source; and

(e) a code segment that transmits the selected portion of the electronic data source from the network server to the mobile information appliance of the user. (emphasis added)

74. A system for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, comprising:

(a) a mobile information appliance operable to receive a spoken request for desired information from the user, wherein said mobile information appliance comprises a portable remote control device or a set-top box for a television;

(b) spoken language processing logic, operable to render an interpretation of the spoken request;

(c) query construction logic, operable to construct a navigation query based upon the interpretation;

(d) navigation logic, operable to select a portion of the electronic data source using the navigation query, and

(e) electronic communications infrastructure for transmitting the selected portion of the electronic data source from the network server to the mobile information appliance of the user. (emphasis added)

Applicants' invention teaches a novel method and apparatus for speech-based navigation where the method receives spoken request for desired information from the user utilizing the mobile information appliance of the user, wherein said mobile information appliance comprises a portable remote control device or a set-top box for a television. This teaching is completely absent in the Levin and Bailey references.

During the Examiner Interview, Applicants' representative indicated to the Examiner that the present claims specifically recite said mobile information appliance comprises a portable remote control device or a set-top box for a television. Applicants' specification (e.g., on page 2) describes a need for a user interface that does not require the user to learn a highly specialized command language or format. In describing Applicants' invention in the context of a home entertainment setting, Applicants disclose the present invention within the context of a portable remote control device or a set-top box for a television. (e.g., See Applicants' specification, page 6, lines 4-20; and page 18, line 4 to page 19, line 9). In sum, Applicants' novel speech-based navigation method is claimed specifically within the context of a portable remote control device or a set-top box for a television.

During the Examiner Interview, Applicants' representative presented to the Examiner that the combination of Levin and Bailey will fall short of making Applicants' invention obvious. Namely, both references do not disclose Applicants' novel speech-based navigation method within the context of a portable remote control device or a set-top box for a television. For example, Bailey states that "the present invention generally relates to a method and system for combining the power, flexibility, and access to information and communications of the Internet with the simplicity, reliability and wide availability of the existing plain old telephone system (POTS)." (See Bailey, Column 1, lines 5-9) Specifically, the entire purpose of Bailey is to salvage the use of a plain old telephone system to access the Internet. Thus, Bailey does not disclose or suggest Applicants' novel speech-based navigation method within the context of a portable remote control device or a set-top box for a television.

Second, the alleged combination (as taught by Bailey) states that "once the information is obtained the system presents the information to the user by transforming the downloaded text into speech in a manner emulating the behavior of a web browser." (Emphasis added) (See Bailey, Column 3, lines 21-25) Bailey then discloses a complicated method of notifying content, e.g., hyperlinks, of a web page to a user via audible signals. (See Bailey, Column 7, line 5 to Column 8, line 10). In sum, Bailey converts a telephone into a user interface that serves as a web browser as positively asserted by Bailey. This teaching is directly contrary to Applicants' invention which recites "receiving a spoken request for desired information from the user utilizing the mobile information appliance of the user, wherein said mobile information appliance comprises a portable remote control device or a set-top box for a television" and interpreting the spoken request. Applicants' invention is intended to address the criticality of not having to navigate the electronic data source, whereas Bailey simply converts the web page content so that the user is required to manually navigate the data source by listening to different audible signals. Thus, Bailey **teaches away** from Applicants' novel speech-based navigation method.

During the Examiner Interview, the Examiner indicated that he will re-evaluate the cited references and reconsider the present rejections. Therefore, the Applicants respectfully submit that independent claims 56, 65 and 74 are not made obvious by the Levin and Bailey references. As such, claims 56, 65 and 74 fully satisfy the requirements of 35 U.S.C. §103 and are patentable thereunder.

Claims 57-64, 66-73 and 75-82 depend, either directly or indirectly, from claims 56, 65 and 74 and recite additional features therefor. Since Levin and Bailey fail to make Applicants' invention obvious as recited in Applicants' independent claims 56, 65 and 74, dependent claims 57-64, 66-73 and 75-82 are also not made obvious under 35 U.S.C. § 103 and are allowable for the same reason noted above.

Conclusion

Thus, the Applicants submit that all of these claims now fully satisfy the requirements of 35 U.S.C. §103. Consequently, the Applicants believe that all these claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues requiring the issuance of a final action in any of the claims now pending in the application, it is requested that the Examiner telephone Mr. Kin-Wah Tong, Esq. at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

1/6/03

Kin-Wah Tong, Attorney
Reg. No. 39,400
(732) 530-9404

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First Floor,
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Received from < 732 530 9808 > at 1/6/03 7:03:49 PM [Eastern Standard Time]

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/608,872	06/30/2000	Christine Halversen	SRIIp037B	2382

7590 01/09/2003

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EXAMINER	
JEAN, FRANTZ B	
ART UNIT	PAPER NUMBER 26
2155	

DATE MAILED: 01/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

Interview Summary	Application No.	Applicant(s)	
	09/608,872	HALVERSEN ET AL.	
	Examiner	**Art Unit**	
	Frantz B. Jean	2155	

All participants (applicant, applicant's representative, PTO personnel):

(1) _Frantz B. Jean_. (3)____.

(2) _Kin-Wah Tong_. (4)____.

Date of Interview: _23 December 2002_ .

Type: a)☐ Telephonic b)☐ Video Conference
c)☒ Personal [copy given to: 1)☐ applicant 2)☒ applicant's representative]

Exhibit shown or demonstration conducted: d)☐ Yes e)☒ No.
If Yes, brief description: ____ .

Claim(s) discussed: Independent claims .

Identification of prior art discussed: Levine & Bailey .

Agreement with respect to the claims f)☐ was reached. g)☒ was not reached. h)☐ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: See below .

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

i)☒ It is not necessary for applicant to provide a separate record of the substance of the interview(if box is checked).

Unless the paragraph above has been checked, THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

Applicants' representative believes that the invention as claimed does define over the prior art of record Levine & Bailey. Examiner disagrees. Examiner has decided to review & go through Levine & Bailey prior art for further consideration.

Examiner Note: You must sign this form unless it is an Attachment to a signed Office action.

Examiner's signature, if required

ummary of Record of Interview Requireme..

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)
In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case unless both applicant and examiner agree that the examiner will record same. Where the examiner agrees to record the substance of the interview, or when it is adequately recorded on the Form or in an attachment to the Form, the examiner should check the appropriate box at the bottom of the Form which informs the applicant that the submission of a separate record of the substance of the interview as a supplement to the Form is not required.

It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

Transaction History Date 2003-03-11
Date information retrieved from USPTO Patent Application Information Retrieval (PAIR) system records at www.uspto.gov

Notice of Allowability	Application No. 09/608,872	Applicant(s) HALVERSEN ET AL.	
	Examiner Frantz B. Jean	Art Unit 2155	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the response filed on 1/06/2003.
2. ☒ The allowed claim(s) is/are 56-82.
3. ☐ The drawings filed on _____ are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.
5. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
   (a) ☐ The translation of the foreign language provisional application has been received.
6. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE**

7. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

8. ☒ CORRECTED DRAWINGS must be submitted.
   (a) ☒ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
   1) ☒ hereto or 2) ☐ to Paper No. _____.
   (b) ☐ including changes required by the proposed drawing correction filed _____, which has been approved by the Examiner.
   (c) ☐. including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No. _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the top margin (not the back) of each sheet. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

9. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1☐ Notice of References Cited (PTO-892)
3☒ Notice of Draftperson's Patent Drawing Review (PTO-948)
5☐ Information Disclosure Statements (PTO-1449), Paper No. _____.
7☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
2☐ Notice of Informal Patent Application (PTO-152)
4☐ Interview Summary (PTO-413), Paper No. _____.
6☐ Examiner's Amendment/Comment
8☒ Examiner's Statement of Reasons for Allowance
9☐ Other

1. Claims 56-82 are allowable over the prior art made of record and in light of Applicants' arguments..

2. The response filed on 01/08/2003 has been entered.

Reasons for Allowance

3. The examiner respectfully submits that the specific techniques of providing a speech-based navigation where a spoken request for desired information is received from a user utilizing a mobile information appliance of the user, wherein the mobile information appliance comprises a portable remote control device or a set-top box for a television; in conjunction with the other limitations of the dependent and independent claims 56-82 were not shown by, would not have been obvious over, nor would have been fairly suggested by the prior art made of record.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frantz B. Jean whose telephone number is (703) 305-3970. The examiner can normally be reached on Monday thru Friday from 8:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ayaz R. Sheikh, can be reached on (703) 305-9648. The fax phone numbers for this Group are (703) 746-7238 for After-Final, (703) 746-7239 for Official, and (703) 746-7240 for Non-Official/Draft.

Communications via Internet e-mail regarding this application, other than those under 35 U.S.C. 132 or which otherwise require a signature, may be used by the applicant and should be addressed to [Ayaz.Sheikh@uspto.gov].

All Internet e-mail communications will be made of record in the application file. PTO employees do not engage in Internet communications where there exists a possibility that sensitive information could be identified or exchanged unless the record includes a properly signed express waiver of the confidentiality requirements of 35 U.S.C. 122. This is more clearly set forth in the Interim Internet Usage Policy published in the Official Gazette of the Patent and Trademark on February 25, 1997 at 1195 OG 89.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305-3900.

Frantz B. Jean
March 07, 2003
FBJ/

Form PTO 948 (Rev. 03/01) U.S. DEPARTMENT OF COMMERCE - Patent and Trademark Office Application No. 09/608872

NOTICE OF DRAFTSPERSON'S PATENT DRAWING REVIEW

The drawing(s) filed (insert date) 6-30-00 are:

A. ☐ approved by the Draftsperson under 37 CFR 1.84 or 1.152.

B. ☒ objected to by the Draftsperson under 37 CFR 1.84 or 1.152 for the reasons indicated below. The Examiner will require submission of new, corrected drawings when necessary. Corrected drawing must be sumitted according to the instructions on the back of this notice.

1. DRAWINGS. 37 CFR 1.84(a): Acceptable categories of drawings: Black ink. Color.
   - ____ Color drawings are not acceptable until petiton is granted. Fig(s) ________
   - ____ Pencil and non black ink not permitted. Fig(s) ________
2. PHOTOGRAPHS. 37 CFR 1.84(b)
   - ____ 1 full-tone set is required. Fig(s) ________
   - ____ Photographs may not be mounted. 37 CFR 1.84(e)
   - ____ Poor quality (half-tone). Fig(s) ________
3. TYPE OF PAPER. 37 CFR 1.84(e)
   - ____ Paper not flexible, strong, white, and durable. Fig(s) ________
   - ____ Erasures, alterations, overwritings, interlineations, folds, copy machine marks not accepted. Fig(s) ________
   - ____ Mylar, velum paper is not acceptable (too thin). Fig(s) ________
4. SIZE OF PAPER. 37 CFR 1.84(f): Acceptable sizes:
   - ____ 21.0 cm by 29.7 cm (DIN size A4)
   - ____ 21.6 cm by 27.9 cm (8 1/2 x 11 inches)
   - ____ All drawing sheets not the same size. Sheet(s) ________
   - ____ Drawings sheets not an acceptable size. Fig(s) ________
5. MARGINS. 37 CFR 1.84(g): Acceptable margins:
   - Top 2.5 cm Left 2.5cm Right 1.5 cm Bottom 1.0 cm SIZE: A4 Size
   - Top 2.5 cm Left 2.5 cm Right 1.5 cm Bottom 1.0 cm SIZE: 8 1/2 x 11
   - Margins not acceptable. Fig(s) ________
   - ________ Top (T) ________ Left (L)
   - ________ Right (R) ________ Bottom (B)
6. VIEWS. 37 CFR 1.84(h)
   REMINDER: Specification may require revision to correspond to drawing changes.
   Partial views. 37 CFR 1.84(h)(2)
   - ____ Brackets needed to show figure as one entity. Fig(s) ________
   - ____ Views not labeled separately or properly. Fig(s) ________
   - ____ Enlarged view not labeled separetely or properly. Fig(s) ________
7. SECTIONAL VIEWS. 37 CFR 1.84 (h)(3)
   - ____ Hatching not indicated for sectional portions of an object. Fig(s) ________
   - ____ Sectional designation should be noted with Arabic or Roman numbers. Fig(s) ________
8. ARRANGEMENT OF VIEWS. 37 CFR 1.84(i)
   - ____ Words do not appear on a horizontal, left-to-right fashion when page is either upright or turned so that the top becomes the right side, except for graphs. Fig(s) ________
9. SCALE. 37 CFR 1.84(k)
   - ____ Scale not large enough to show mechanism without crowding when drawing is reduced in size to two-thirds in reproduction. Fig(s) ________
10. CHARACTER OF LINES, NUMBERS, & LETTERS. 37 CFR 1.84(l)
    - X Lines, numbers & letters not uniformly thick and well defined, clean, durable, and black (poor line quality). Fig(s) ALL
11. SHADING. 37 CFR 1.84(m)
    - ____ Solid black areas pale. Fig(s) ________
    - X Solid black shading not permitted. Fig(s) 6
    - ____ Shade lines, pale, rough and blurred. Fig(s) ________
12. NUMBERS, LETTERS, & REFERENCE CHARACTERS. 37 CFR 1.84(p)
    - X Numbers and reference characters not plain and legible. Fig(s) ALL
    - X Figure legends are poor. Fig(s) ALL
    - ____ Numbers and reference characters not oriented in the same direction as the view. 37 CFR 1.84(p)(1) Fig(s) ________
    - ____ English alphabet not used. 37 CFR 1.84(p)(2) Figs ________
    - ____ Numbers, letters and reference characters must be at least .32 cm (1/8 inch) in height. 37 CFR 1.84(p)(3) Fig(s) ________
13. LEAD LINES. 37 CFR 1.84(q)
    - ____ Lead lines cross each other. Fig(s) ________
    - ____ Lead lines missing. Fig(s) ________
14. NUMBERING OF SHEETS OF DRAWINGS. 37 CFR 1.84(t)
    - ____ Sheets not numbered consecutively, and in Arabic numerals beginning with number 1. Sheet(s) ________
15. NUMBERING OF VIEWS. 37 CFR 1.84(u)
    - ____ Views not numbered consecutively, and in Arabic numerals, beginning with number 1. Fig(s) ________
16. CORRECTIONS. 37 CFR 1.84(w)
    - ____ Corrections not made from prior PTO-948 dated ________
17. DESIGN DRAWINGS. 37 CFR 1.152
    - ____ Surface shading shown not appropriate. Fig(s) ________
    - ____ Solid black shading not used for color contrast. Fig(s) ________

COMMENTS

REVIEWER [signature] DATE 3-10-03 TELEPHONE NO. ________

ATTACHMENT TO PAPER NO. 27

Attachment for PTO-948 (Rev. 03/01, or earlier)
6/18/01

The below text replaces the pre-printed text under the heading, "Information on How to Effect Drawing Changes," on the back of the PTO-948 (Rev. 03/01, or earlier) form.

INFORMATION ON HOW TO EFFECT DRAWING CHANGES

1. Correction of Informalities -- 37 CFR 1.85

New corrected drawings must be filed with the changes incorporated therein Identifying indicia, if provided, should include the title of the invention, inventor's name, and application number, or docket number (if any) if an application number has not been assigned to the application. If this information is provided, it must be placed on the front of each sheet and centered within the top margin. If corrected drawings are required in a Notice of Allowability (PTOL-37), the new drawings **MUST** be filed within the **THREE MONTH** shortened statutory period set for reply in the Notice of Allowability. Extensions of time may NOT be obtained under the provisions of 37 CFR 1.136(a) or (b) for filing the corrected drawings after the mailing of a Notice of Allowability. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

2. Corrections other than Informalities Noted by Draftsperson on form PTO-948.

All changes to the drawings, other than informalities noted by the Draftsperson, **MUST** be made in the same manner as above except that, normally, a highlighted (preferably red ink) sketch of the changes to be incorporated into the new drawings **MUST** be approved by the examiner before the application will be allowed. No changes will be permitted to be made, other than correction of informalities, unless the examiner has approved the proposed changes.

Timing of Corrections

Applicant is required to submit the drawing corrections <u>within the time period set in the attached Office communication</u>. See 37 CFR 1.85(a).

Failure to take corrective action within the set period will result in ABANDONMENT of the application.

06/01/01

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

#27

NOTICE OF ALLOWANCE AND FEE(S) DUE

7590 03/11/2003

THOMASON, MOSER & PATTERSON, LLP
595 SHREWSBURY AVENUE
SUITE 100
SHREWSBURY, NJ 07702

EXAMINER	
JEAN, FRANTZ B	
ART UNIT	CLASS-SUBCLASS
2155	709-218000

DATE MAILED: 03/11/2003

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/608,872	06/30/2000	Christine Halversen	SRILP037B	2382

TITLE OF INVENTION: MOBILE NAVIGATION OF NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN INPUT

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$650	$0	$650	06/11/2003

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE REFLECTS A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE APPLIED IN THIS APPLICATION. THE PTOL-85B (OR AN EQUIVALENT) MUST BE RETURNED WITHIN THIS PERIOD EVEN IF NO FEE IS DUE OR THE APPLICATION WILL BE REGARDED AS ABANDONED.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status is changed, pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above and notify the United States Patent and Trademark Office of the change in status, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check the box below and enclose the PUBLICATION FEE and 1/2 the ISSUE FEE shown above.

☐ Applicant claims SMALL ENTITY status.
See 37 CFR 1.27.

II. PART B - FEE(S) TRANSMITTAL should be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). Even if the fee(s) have already been paid, Part B - Fee(s) Transmittal should be completed and returned. If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Box ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PTOL-85 (REV. 04-02) Approved for use through 01/31/2004.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail Box ISSUE FEE
Commissioner for Patents
Washington, D.C. 20231
Fax (703)746-4000

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 4 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Legibly mark-up with any corrections or use Block 1)

7590 03/11/2003

THOMASON, MOSER & PATTERSON, LLP
595 SHREWSBURY AVENUE
SUITE 100
SHREWSBURY, NJ 07702

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Box Issue Fee address above, or being facsimile transmitted to the USPTO, on the date indicated below.

(Depositor's name)

(Signature)

(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/608,872	06/30/2000	Christine Halversen	SRILP037B	2382

TITLE OF INVENTION: MOBILE NAVIGATION OF NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN INPUT

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$650	$0	$650	06/11/2003

EXAMINER	ART UNIT	CLASS-SUBCLASS
JEAN, FRANTZ B	2155	709-218000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 ____________
2 ____________
3 ____________

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. Inclusion of assignee data is only appropriate when an assignment has been previously submitted to the USPTO or is being submitted under separate cover. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) ☐ individual ☐ corporation or other private group entity ☐ government

4a. The following fee(s) are enclosed:

☐ Issue Fee

☐ Publication Fee

☐ Advance Order - # of Copies ____________

4b. Payment of Fee(s):

☐ A check in the amount of the fee(s) is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Commissioner is hereby authorized by charge the required fee(s), or credit any overpayment, to Deposit Account Number ____________ (enclose an extra copy of this form).

Commissioner for Patents is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above.

(Authorized Signature) (Date)

NOTE; The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, D.C. 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, Washington, DC 20231.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TRANSMIT THIS FORM WITH FEE(S)

PTOL-85 (REV. 04-02) Approved for use through 01/31/2004. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/608,872	06/30/2000	Christine Halversen	SRILP037B	2382

7590 03/11/2003

THOMASON, MOSER & PATTERSON, LLP
595 SHREWSBURY AVENUE
SUITE 100
SHREWSBURY, NJ 07702

EXAMINER	
JEAN, FRANTZ B	
ART UNIT	PAPER NUMBER
2155	

DATE MAILED: 03/11/2003

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The patent term adjustment to date is 0 days. If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the term adjustment will be 0 days.

If a continued prosecution application (CPA) was filed in the above-identified application, the filing date that determines patent term adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) system. (http://pair.uspto.gov)

Any questions regarding the patent term extension or adjustment determination should be directed to the Office of Patent Legal Administration at (703)305-1383.

PTOL-85 (REV. 04-02) Approved for use through 01/31/2004.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
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09/608,872	06/30/2000	Christine Halversen	SRILP037B	2382

7590 03/11/2003

THOMASON, MOSER & PATTERSON, LLP
595 SHREWSBURY AVENUE
SUITE 100
SHREWSBURY, NJ 07702
UNITED STATES

EXAMINER	
JEAN, FRANTZ B	
ART UNIT	**PAPER NUMBER**
2155	

DATE MAILED: 03/11/2003

Notice of Fee Increase on January 1, 2003

If a reply to a "Notice of Allowance and Fee(s) Due" is filed in the Office on or after January 1, 2003, then the amount due will be higher than that set forth in the "Notice of Allowance and Fee(s) Due" since there will be an increase in fees effective on January 1, 2003. See Revision of Patent and Trademark Fees for Fiscal Year 2003; Final Rule, 67 Fed. Reg. 70847, 70849 (November 27, 2002).

The current fee schedule is accessible from: http://www.uspto.gov/main/howtofees.htm.

If the issue fee paid is the amount shown on the "Notice of Allowance and Fee(s) Due," but not the correct amount in view of the fee increase, a "Notice to Pay Balance of Issue Fee" will be mailed to applicant. In order to avoid processing delays associated with mailing of a "Notice to Pay Balance of Issue Fee," if the response to the Notice of Allowance and Fee(s) due form is to be filed on or after January 1, 2003 (or mailed with a certificate of mailing on or after January 1, 2003), the issue fee paid should be the fee that is required at the time the fee is paid. If the issue fee was previously paid, and the response to the "Notice of Allowance and Fee(s) Due" includes a request to apply a previously-paid issue fee to the issue fee now due, then the difference between the issue fee amount at the time the response is filed and the previously paid issue fee should be paid. See Manual of Patent Examining Procedure, Section 1308.01 (Eighth Edition, August 2001).

Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at (703) 305-8283.

Transaction History Date 2003-05-06
Date information retrieved from USPTO Patent Application Information Retrieval (PAIR) system records at www.uspto.gov

BEST COPY

PART B - FEE(S) TRANSMITTAL

OIPE MAY 0 6 2003

Complete and send this form, together with applicable fee(s), to: Mail Box ISSUE FEE
Commissioner for Patents
Washington, D.C. 20231
Fax (703)746-4000

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 4 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Legibly mark-up with any corrections or use Block 1)

7590 03/11/2003

THOMASON, MOSER & PATTERSON, LLP
595 SHREWSBURY AVENUE
SUITE 100
SHREWSBURY, NJ 07702

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Box Issue Fee address above, or being facsimile transmitted to the USPTO, on the date indicated below.

Barbara J. Jackson	(Depositor's name)
Barbara J. Jackson	(Signature)
April 30, 2003	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/608,872	06/30/2000	Christine Halverson	SRILP037B	2382

TITLE OF INVENTION: MOBILE NAVIGATION OF NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN INPUT

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$650	$0	$650	06/11/2003

EXAMINER	ART UNIT	CLASS-SUBCLASS
JEAN, FRANTZ B	2155	709-218000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1. Moser, Patterson & ~~Sheridan, LLP~~
2. Kin-Wah Tong
3. ______

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. Inclusion of assignee data is only appropriate when an assignment has been previously submitted to the USPTO or is being submitted under separate cover. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: SRI International

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Menlo Park, CA

Please check the appropriate assignee category or categories (will not be printed on the patent) ☐ individual ☒ corporation or other private group entity ☐ government

4a. The following fee(s) are enclosed:

☒ Issue Fee
☐ Publication Fee
☒ Advance Order - # of Copies 1

4b. Payment of Fee(s):

☒ A check in the amount of the fee(s) is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☒ The Commissioner is hereby authorized by charge the required fee(s), or credit any overpayment, to Deposit Account Number 20-0782 (enclose an extra copy of this form).

Commissioner for Patents is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above.

(Authorized Signature) [signature] (Date) 4/30/03

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, D.C. 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, Washington, DC 20231.

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01 FC:2501 650.00 OP
02 FC:8001 3.00 OP

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PTOL-85 (REV. 04-02) Approved for use through 01/31/2004. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

#23
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OIPE JC54
MAY 0 6 2003
PATENT & TRADEMARK OFFICE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Halverson, et al.

Serial No.: 09/608,872 Art Unit: 2155

Filing Date: June 30, 2000 Examiner: Jean, Frantz B

For: MOBILE NAVIGATION OF NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN INPUT

Docket No. SRI 4116-6

Assistant Commissioner for Patents
Washington, D.C. 20231
S I R:

SUBMISSION OF FORMAL DRAWINGS

The Applicants submit herewith 7 sheets of formal drawings (FIGS. 1 through 6), properly labeled, in connection with the above-captioned application. The Examiner is requested to substitute these formal drawings for the informal drawings previously submitted.

Respectfully submitted,

Dated: 4/29/03

KIN-WAH TONG
Reg. No. 39,400
(732) 530-9404

Moser, Patterson & Sheridan, LLP
595 Shrewsbury Avenue
Suite 100
Shrewsbury, NJ 07702

CERTIFICATE OF MAILING under 37 C.F.R. 1.8(a)

I hereby certify that this correspondence is being deposited on April 30 2003, with the United States Postal Service as first class mail, with sufficient postage, in an envelope addressed to the Commissioner for Patents, Box Issue Fee, Washington, D.C. 20231.

Signature

April 30, 2003
Date of signature

6757718

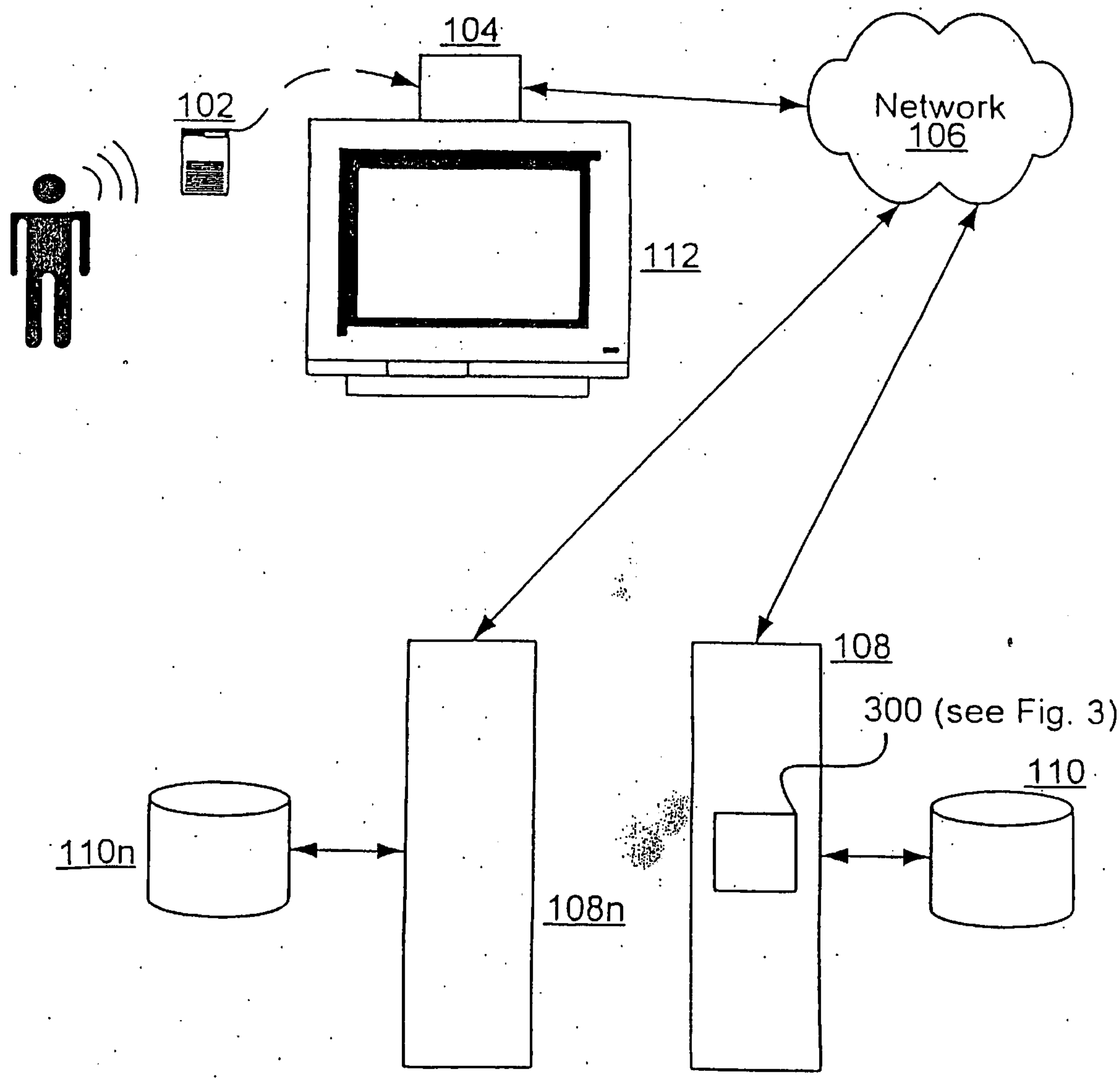


Fig. 1a

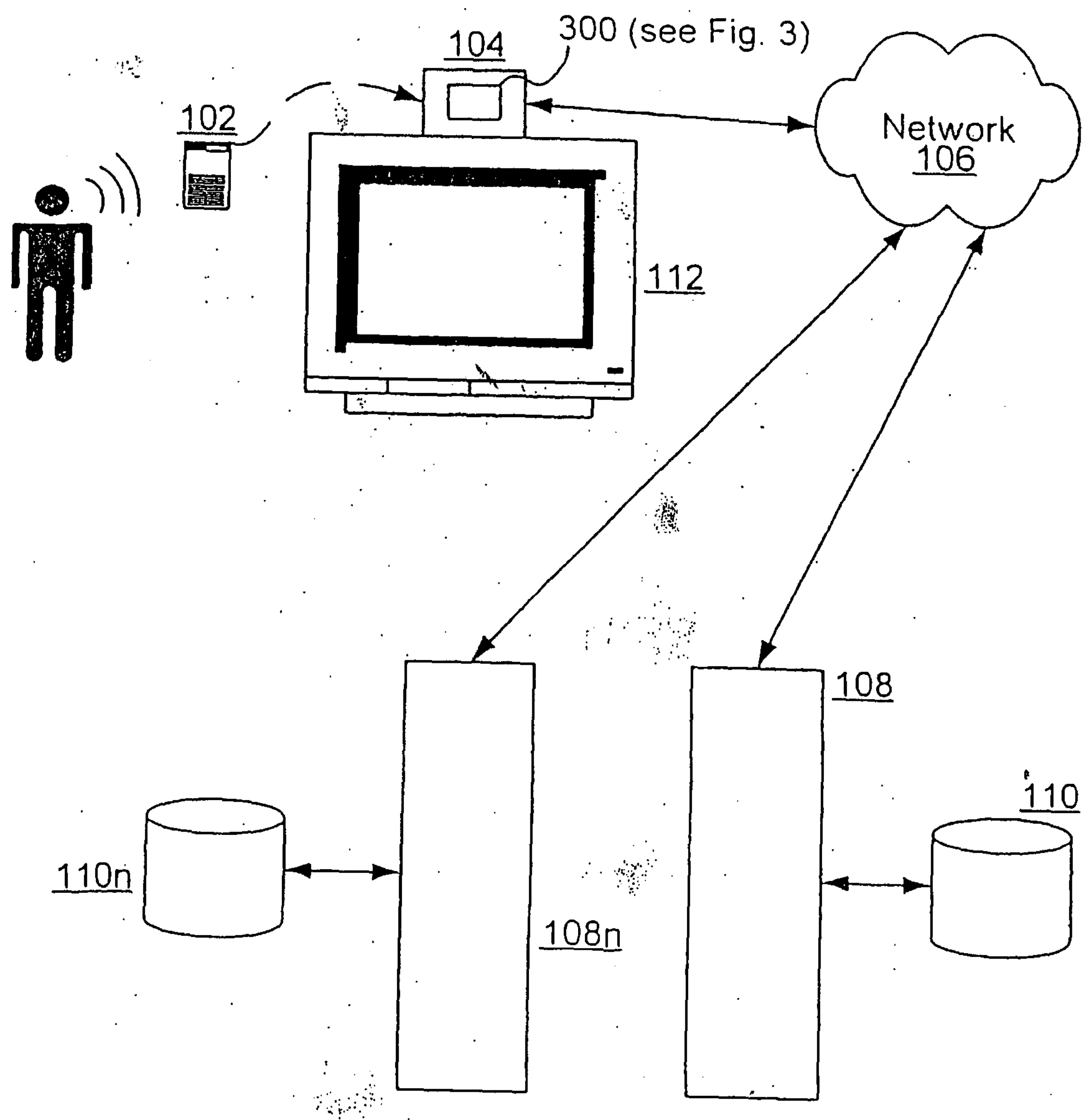


Fig. 1b

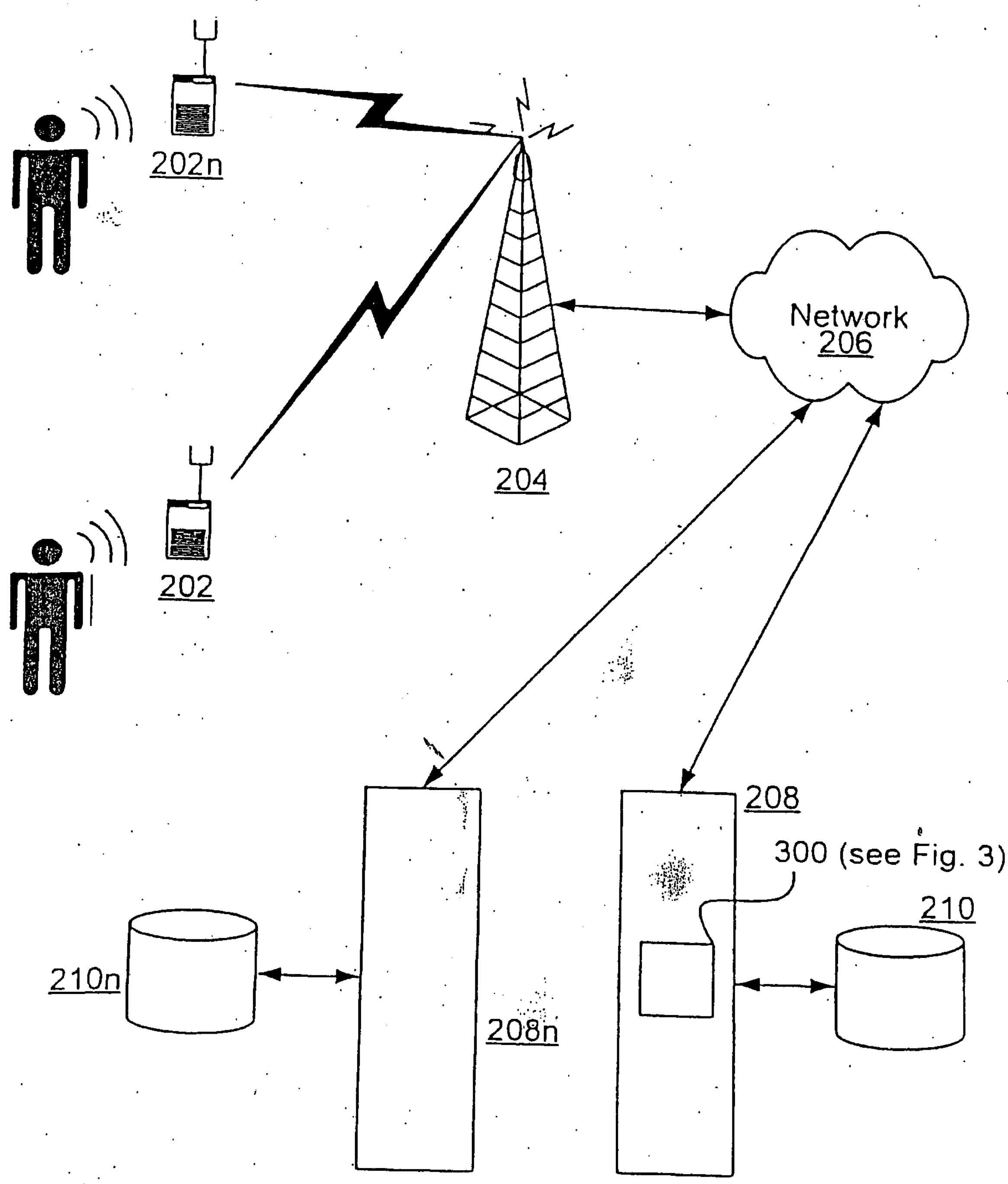


Fig. 2

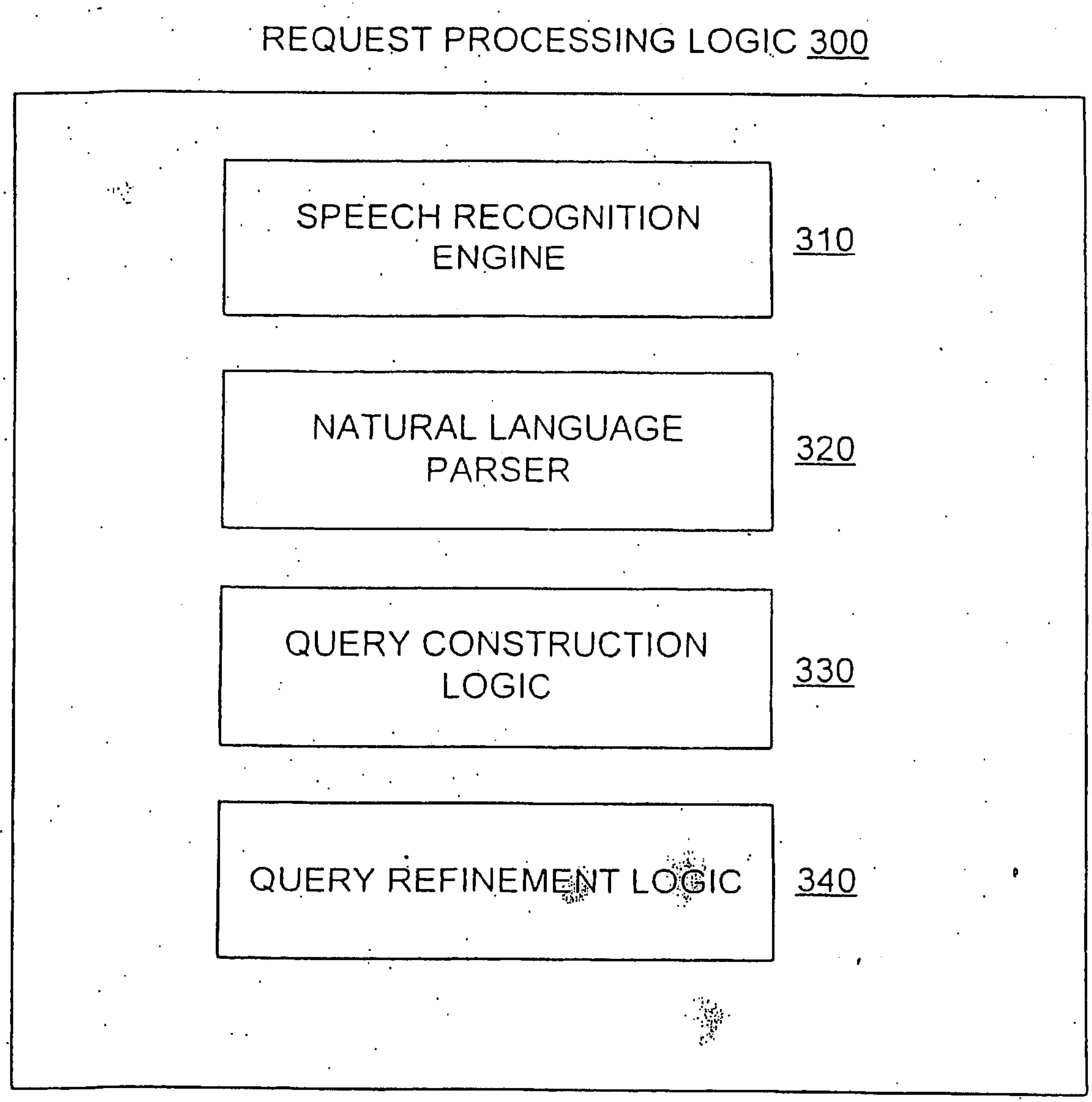

REQUEST PROCESSING LOGIC 300
SPEECH RECOGNITION ENGINE
310
NATURAL LANGUAGE PARSER
320
QUERY CONSTRUCTION LOGIC
330
QUERY REFINEMENT LOGIC
340

Fig. 3

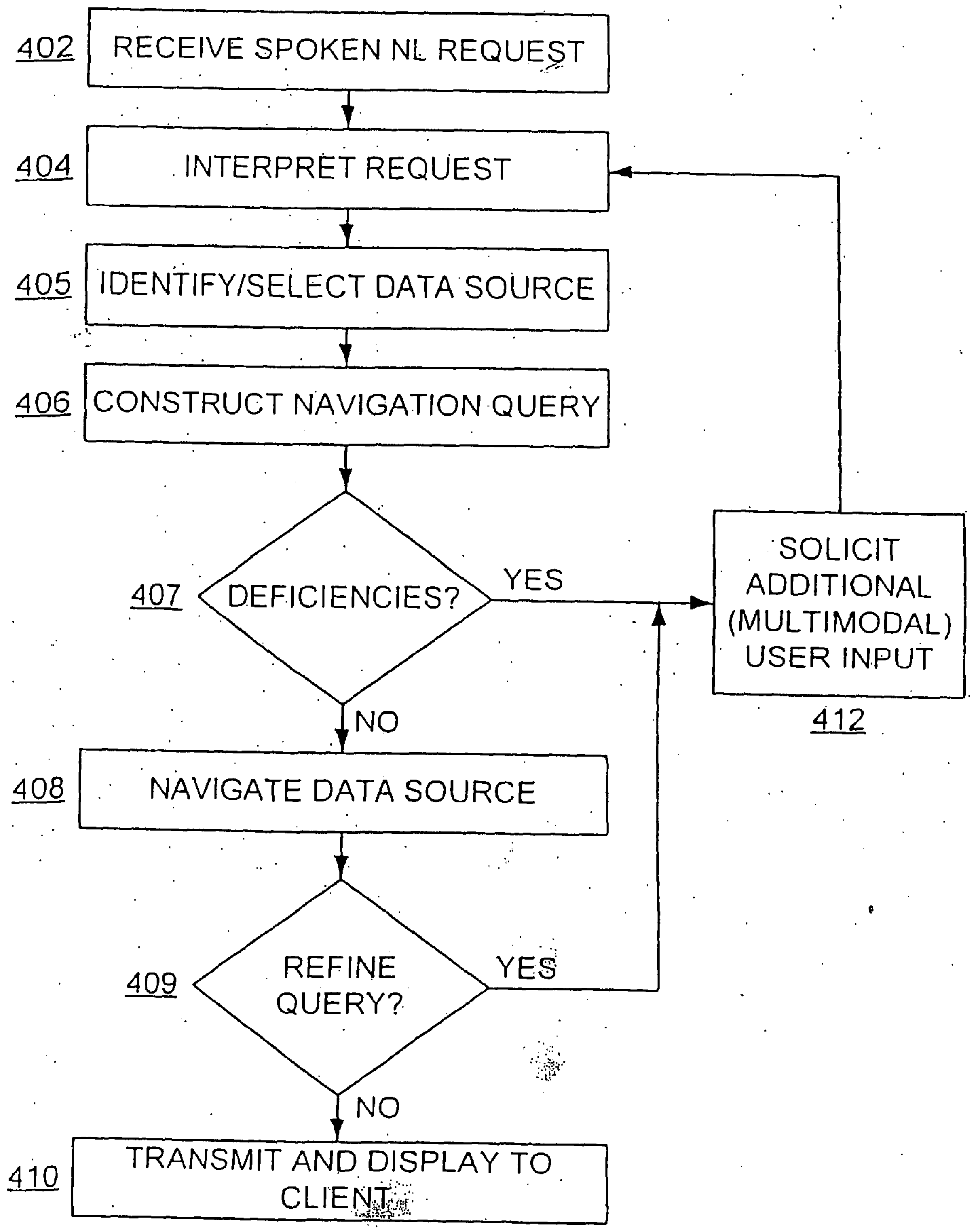

402
RECEIVE SPOKEN NL REQUEST
404
INTERPRET REQUEST
405
IDENTIFY/SELECT DATA SOURCE
406
CONSTRUCT NAVIGATION QUERY
407
DEFICIENCIES?
YES
NO
SOLICIT ADDITIONAL (MULTIMODAL) USER INPUT
412
408
NAVIGATE DATA SOURCE
409
REFINE QUERY?
YES
NO
410
TRANSMIT AND DISPLAY TO CLIENT

Fig. 4

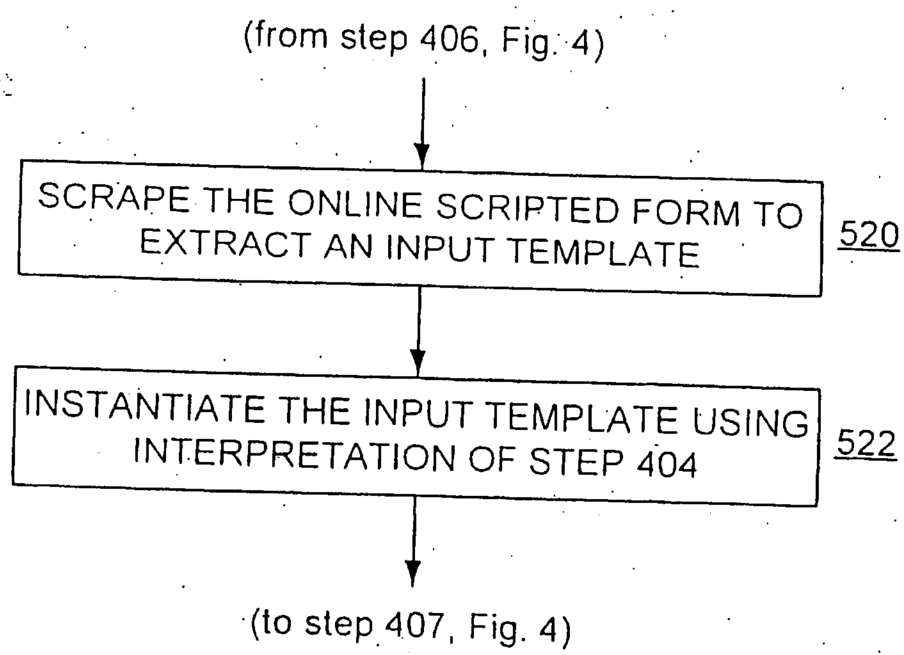
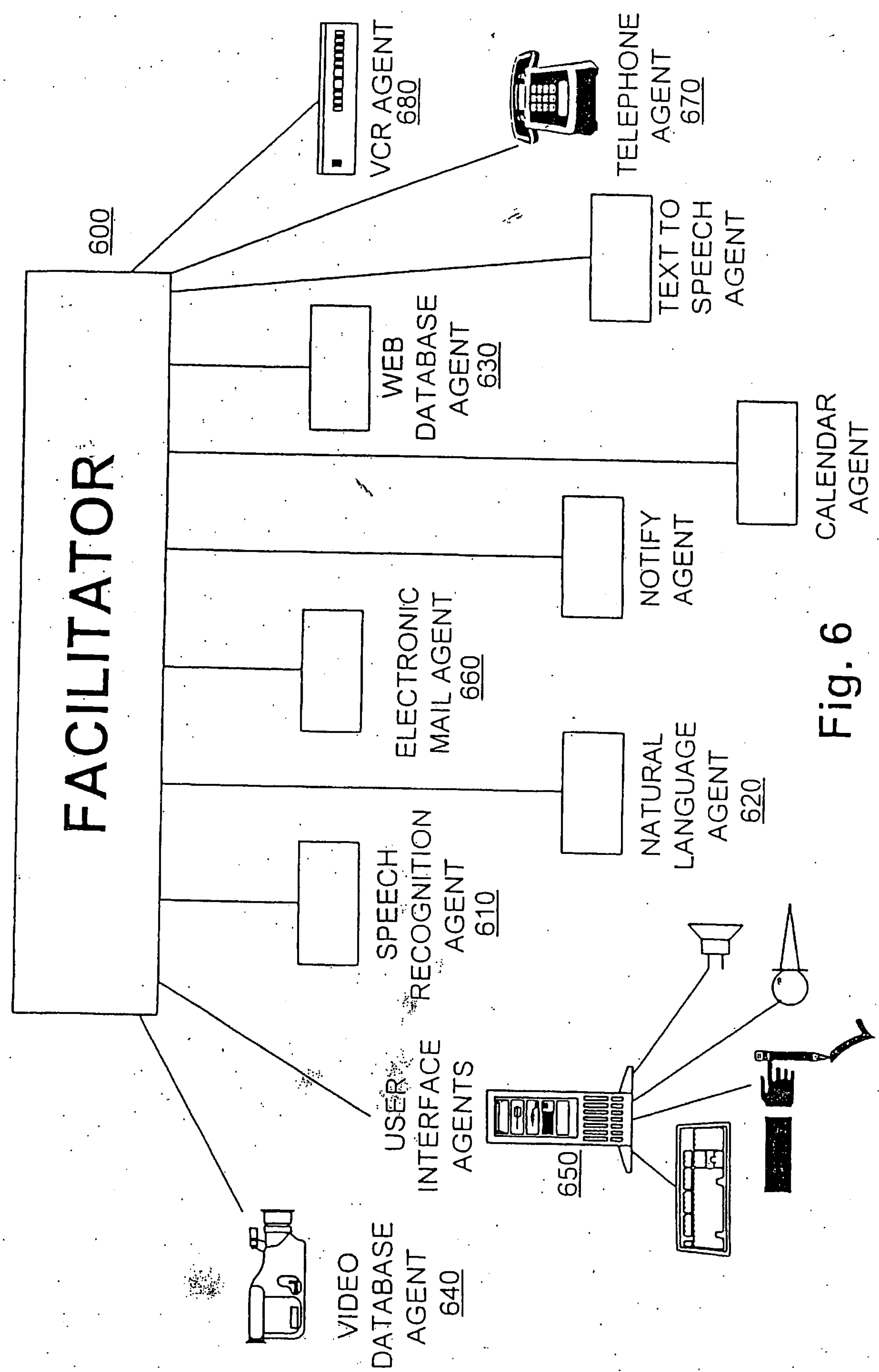

(from step 406, Fig. 4)
SCRAPE THE ONLINE SCRIPTED FORM TO EXTRACT AN INPUT TEMPLATE
520
INSTANTIATE THE INPUT TEMPLATE USING INTERPRETATION OF STEP 404
522
(to step 407, Fig. 4)

Fig. 5

7/7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FACILITATOR
VCR AGENT
680
TELEPHONE
AGENT
670
TEXT TO
SPEECH
AGENT
WEB
DATABASE
AGENT
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AGENT
NOTIFY
AGENT
ELECTRONIC
MAIL AGENT
660
NATURAL
LANGUAGE
AGENT
620
SPEECH
RECOGNITION
AGENT
610
USER
INTERFACE
AGENTS
650
VIDEO
DATABASE
AGENT
640

Fig. 6

File History Content Report

The following content is missing from the original file history record obtained from the United States Patent and Trademark Office. No additional information is available.

Document Date - 2004-06-29

Document Title - USPTO Grant

File History Content Report

The following content is missing from the original file history record obtained from the United States Patent and Trademark Office. No additional information is available.

Document Date - 2006-08-16

Document Title - USPTO Communication Re: Entity Status Set to Undiscounted (Initial Default Setting or Status Change)

AO 120 (Rev. 08/10)

TO: **Mail Stop 8** **Director of the U.S. Patent and Trademark Office** **P.O. Box 1450** **Alexandria, VA 22313-1450**	**REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK**

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court for the District of Delaware on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED 1/19/2017	U.S. DISTRICT COURT for the District of Delaware
PLAINTIFF IPA TECHNOLOGIES INC.		DEFENDANT SONY CORPORATION, ET AL.

PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 6,742,021	5/25/2004	IPA TECHNOLOGIES INC.
2 6,523,061	2/18/2003	IPA TECHNOLOGIES INC.
3 6,757,718	6/29/2004	IPA TECHNOLOGIES INC.
4		
5		

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
2		
3		
4		
5		

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

AO 120 (Rev. 08/10)

TO: Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court for the District of Delaware on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED 3/17/2017	U.S. DISTRICT COURT for the District of Delaware
PLAINTIFF IPA TECHNOLOGIES INC.		DEFENDANT NVIDIA CORPORATION

PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 6,742,021	5/25/2004	IPA TECHNOLOGIES INC.
2 6,523,061	2/18/2003	IPA TECHNOLOGIES INC.
3 6,757,718	6/29/2004	IPA TECHNOLOGIES INC.
4		
5		

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
2		
3		
4		
5		

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

In Re:	U.S. Patent 6,757,718	: Attorney Docket No. 081841.0113
Inventor:	Christine Halverson *et al.*	:
Filed:	June 30, 2000	:
Issued:	June 29, 2004	: IPR No.: Unassigned
Assignee:	IPA Technologies Inc.	
Title:	Mobile Navigation of Network-Based Electronic Information using Spoken Input	

Mail Stop PATENT BOARD
Patent Trial and Appeal Board
U.S. Patent and Trademark Office
P.O. Box 1450
Alexandria, Virginia 22313-1450

PETITIONER'S POWER OF ATTORNEY

Petitioners DISH Network Corporation and DISH Network L.L.C. (collectively "Petitioner" or "DISH") hereby appoints the following practitioners as its attorneys to transact all business in the United States Patent and Trademark Office associated with DISH's Petition for *Inter Partes* Review of U.S. Patent No. 6,757,718:

Lead Counsel	**Back-up Counsel**
Eliot Williams Reg. No. 50,822 Baker Botts L.L.P. 1001 Page Mill Rd. Palo Alto, CA 94304-1007 Tel. 650-739-7500 Fax 650-736-7699 eliot.williams@bakerbotts.com	G. Hopkins Guy Reg. No. 35,886 Baker Botts L.L.P. 1001 Page Mill Rd. Palo Alto, CA 94304-1007 Tel. 650-739-7500 Fax 650-736-7699 hop.guy@bakerbotts.com Ali Dhanani Reg. No. 66,233 910 Louisiana St. Houston, TX 77002 Tel. 713-229-1234 Fax 713-229-1522 ali.dhanani@bakerbotts.com

The individual signing below has the authority to execute this document on behalf of DISH.

Petitioners DISH Network Corporation and DISH Network L.L.C.

Signature: James E Hanft Date: 12/19/2017

Name: JAMES HANFT

Title: Director & Sr Corporate Counsel, IP

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

In Re:	U.S. Patent 6,757,718	: Attorney Docket No. 081841.0113
Inventor:	Christine Halverson *et al*.	:
Filed:	June 30, 2000	:
Issued:	June 10, 2004	: IPR No.: Unassigned
Assignee:	IPA Technologies Inc.	
Title:	Mobile Navigation of Network-Based Electronic Information using Spoken Input	

Mail Stop PATENT BOARD
Patent Trial and Appeal Board
U.S. Patent and Trademark Office
P.O. Box 1450
Alexandria, Virginia 22313-1450

Submitted Electronically via the Patent Trial and Appeal Board End to End System

PETITION FOR *INTER PARTES* REVIEW OF CLAIMS 1-4, 6, 8-9, 10-13, 15, 17-18, 19-22, 24, AND 26-27 OF U.S. PATENT NO. 6,757,718 UNDER 35 U.S.C. §§ 311-319 AND 37 C.F.R. §§ 42.100 *ET SEQ.*

TABLE OF CONTENTS

LIST OF EXHIBITS

1001	U.S. Patent No. 6,742,021 by Christine Halverson, Luc Julia, Dimitris Voutsas, and Aden J. Cheyer, entitled "Navigating Network-Based Electronic Information Using Spoken Input with Multimodal Error Feedback"
1002	File History for U.S. Patent No. 6,742,021
1003	U.S. Patent No. 6,757,718 by Christine Halverson, Luc Julia, Dimitris Voutsas, and Adam Cheyer, entitled "Mobile Navigation of Network-Based Electronic Information Using Spoken Input"
1004	File History for U.S. Patent No. 6,757,718
1005	U.S. Patent No. 6,523,061 by Christine Halverson, Luc Julia, Dimitris Voutsas, and Adam Cheyer, entitled "System, Method, and Article of Manufacture for Agent-Based Navigation in a Speech-Based Data Navigation System"
1006	File History for U.S. Patent No. 6,523,061
1007	U.S. Patent No. 6,851,115 by Christine Halverson, Luc Julia, Dimitris Voutsas, and Adam Cheyer, entitled "Software-Based Architecture for Communication and Cooperation Among Distributed Electronic Agents"
1008	File History for U.S. Patent No. 6,851,115
1009	File History for U.S. Patent Application No. 60/124,720
1010	File History for U.S. Patent Application No. 60/124,719
1011	File History for U.S. Patent Application No. 60/124,718
1012	Declaration of Dr. Kevin Negus
1013	U.S. Patent No. 5,500,920 by Julian M. Kupiec, entitled "Semantic Co-ocurrence Filtering for Speech Recognition and Signal Transcription Applications" ("*Kupiec*")
1014	U.S. Patent No. 6,006,227 by Eric Freeman *et al.*, entitled "Document Stream Operating System" ("*Freeman*")

1015	U.S. Patent No. 5,247,580 by Toshiyuki Kimura et al., entitled "Voice-operated remote control system" ("*Kimura*")
1016	Complaint, *IPA Technologies Inc. v. DISH Network Corp. et al.*, No. 1:16-cv-01170 (D. Del.) ("District Court Litigation")
1017	Proof of Service of Complaint on DISH Network L.L.C. and DISH Network Corporation
1018	Source Code Appendix to U.S. Patent No. 5,500,920 by Julian M. Kupiec
1019	Non-patent literature publication by Adam J. Cheyer and Luc Julia, two of the named inventors on the '061 Patent, entitled "Multimodal Maps: An Agent-based Approach" ("Cheyer"), first published on May 26, 1995.
1020	Non-patent literature publication by Sankyu Park et. al, citing Cheyer article, entitled "A Framework for Multi-Agent Systems with Multi-modal User Interfaces in Distributed Computing Environments," published in 1997.
1021	Non-patent literature publication by Yi Han and Ingrid Zukerman, citing Cheyer article, entitled "A Mechanism for Multimodal Presentation Planning Based on Agent Cooperation and Negotiation," published in 1997.
1022	Non-patent literature publication by Andrew Kehler et al., citing Cheyer article, entitled "On Representing Salience and Reference in Multimodal Human-Computer Interaction," published in 1998.
1023	Non-patent literature publication by Philip Cohen et al., citing Cheyer article, entitled "QuickSet: Multimodal Interaction for Distributed Applications," published in 1997.
1024	Non-patent literature publication by Jean-Claude Martin, citing Cheyer article, entitled "Towards 'intelligent' cooperation between modalities. The example of a system enabling multimodal interaction with a map," published in 1997.

1025	Non-patent literature publication by Michael Johnston et al., citing Cheyer article, entitled "Unification-based Multimodal Integration," published in 1997.
1026	Declaration of Harry Bunt Concerning the International Conference on Cooperative Multimodal Communication (CMC /95) in Eindhoven, May 24-26, 1995 and the Publication of Papers Presented at the Conference.
1027	Declaration of Michael McTear Concerning the International Conference on Cooperative Multimodal Communication (CMC /95) in Eindhoven, May 24-26, 1995.
1028	Declaration of Gert-Jan van Velzen Concerning the "Proceedings of the International Conference on Cooperative Multimodal communications: CMC /95, Eindhoven, May 24-26, 1995" Reference.
1029	Affidavit of Christopher Butler from the Internet Archive.
1030	Declaration of Scott Bennett, Ph.D.
1031	Declaration of Ted Baldwin Concerning the "PAAM 96: Proceedings of the First International Conference on the Practical Application of Intelligent Agents and Multi-Agent Technology, 22nd-24th April 1996" Reference.
1032	Redline Comparison between article text of *Cheyer* in Exhibit 1019 (published in 1995 Proceedings Publication) and article text in Ex. 1030, Attachment 1d (republished in 1998 Proceedings Publication).
1033	Redline Comparison between article text of *Cheyer* in Exhibit 1019 (published in 1995 Proceedings Publication) and article text in Ex. 1029, Exhibit A (Cheyer Article on SRI Website no later than August 1997 and preserved by Internet Archive).
1034	Certified Translations of Exhibits C and D to the Declaration of Gert-Jan van Velzen (Exhibit 1028).

I. MANDATORY NOTICES, STANDING, AND FEES

Real Party in Interest: DISH Network Corporation and DISH Network L.L.C. (collectively, "Petitioner" or "DISH") are the Petitioner. DISH is a provider of direct broadcast satellite services. Non-party EchoStar Technologies L.L.C. is a real party in interest. EchoStar Technologies L.L.C. is now a subsidiary of DISH Network Corporation and provides set top boxes to DISH that are used to provide direct broadcast satellite services to customers. In the past, DISH has also listed EchoStar Corporation (the former corporate parent of EchoStar Technologies L.L.C.) as a real party in interest in PTAB proceedings involving DISH. However, due to the change in EchoStar Technologies L.L.C.'s ownership, EchoStar Corporation is no longer a real party in interest for this proceeding.

Related Matters: The '718 Patent is currently involved in a pending lawsuit involving Petitioner entitled *IPA Technologies, Inc. v. DISH Network Corporation et al.*, United States District Court for the District of Delaware, Case No. 1:16-CV-01170 (RGA) (the "District Court Action"). *See* Ex. 1016. Patent Owner asserts U.S. Patent No. 6,757,718 against Petitioner in the District Court Action. Ex. 1016, pp. 13-17. The '718 Patent is also involved in the following related proceedings: *IPA Technologies Inc. v. NVIDIA Corporation.,* No. 1-17-cv-00287 (D. Del.); *IPA Technologies Inc. v. Sony Electronics Inc., et al.,* No. 1-17-cv-00055 (D. Del.); *IPA Technologies Inc. v. Amazon.com, Inc. et al.,* No. 1-16-cv-01266 (D. Del.).

Lead Counsel and Request for Authorization: Pursuant to 37 C.F.R. §§ 42.8(b)(3) and 42.10(a), Petitioner designates the following: Lead Counsel is Eliot D. Williams (Reg. No. 50,822) of Baker Botts L.L.P.; Back-up Counsel are G. Hopkins Guy (Reg. No. 35,886) and Ali Dhanani (Reg. No. 66,233) of Baker Botts L.L.P.

Service Information: Service information is as follows: Baker Botts L.L.P., 1001 Page Mill Rd., Palo Alto, CA 94304-1007 Tel. 650 739 7500; Fax 650-736-7699. Petitioner consents to service by electronic mail at eliot.williams@bakerbotts.com, hop.guy@bakerbotts.com, and ali.dhanani@bakerbotts.com. A Power of Attorney is filed concurrently herewith under 37 C.F.R. § 42.10(b).

Certification of Grounds: Petitioners certify that the ’718 Patent is eligible for *inter partes* review. Petitioners were served with the complaint in the District Court Action on December 20, 2016. Ex. 1017. Therefore, Petitioners are not barred or estopped from requesting *inter partes* review on the grounds set forth herein.

Fees: The Office is authorized to charge the fee set forth in 37 C.F.R. § 42.15(b) to Deposit Account No. 02-0384 as well as any additional fees that might be due in connection with this Petition.

II. OVERVIEW OF CHALLENGE AND RELIEF REQUESTED

Petitioner challenges claims 1-4, 6, 8-9, 10-13, 15, 17-18, 19-22, 24, and 26-27 of U. S. Patent No. 6, 757,718 (the "'718 Patent), titled "Mobile Navigation of Network-Based Electronic Information Using Spoken Input." *See* Ex. 1001.

A. *Publications Relied Upon*

As discussed *infra*, the '718 Patent is not entitled to a priority date before March 13, 2000. Petitioner relies upon the following patents and publications:

Exhibit 1013 — U.S. Patent No. 5,500,920 by Julian M. Kupiec, entitled "Semantic co-occurrence filtering for speech recognition and signal transcription applications" ("*Kupiec*"), filed on September 30, 1994 and issued on March 19, 1996. *Kupiec* is available as prior art under at least 35 U.S.C. §§ 102(a), 102(b), and 102(e).

Exhibit 1019 — Adam J. Cheyer and Luc Julia of SRI International ("SRI"), two of the named inventors on the '061 Patent, entitled "Multimodal Maps: An Agent-based Approach" ("*Cheyer*"). Ex. 1019, p.2. As detailed below, Cheyer was first distributed and made available to members of the public having ordinary skill in the art no later than May 24, 1995. Cheyer was thereafter indexed and catalogued and publicly available in libraries around the world and on SRI's public website. Cheyer is a publication under 102(b) because it has been "disseminated or otherwise made available to the extent that persons interested and ordinarily

skilled in the subject matter or art exercising reasonable diligence, can locate it." *SRI Int'l, Inc. v. Internet Sec. Sys., Inc.*, 511 F.3d 1186, 1194 (Fed. Cir. 2008).

May 24, 1995 Presentation at CMC/95 Conference

The First International Conference on Cooperative Multimodal Communication was held in Eindhoven, The Netherlands from May 24-26, 1995 ("CMC/95"). Ex. 1019; Ex. 1026, ¶¶ 5,10-11; Ex. 1027, ¶¶5,8. Certain papers presented at the conference, including Cheyer, were collected and published in the "Proceedings of the International Conference on Cooperative Multimodal Communication CMC/95: Eindhoven, May 24-26, 1995" by H.C. Bunt and R.J. Beun ("1995 Proceedings Publication"). Ex. 1026, ¶10. The 1995 Proceedings Publication, including Cheyer, was distributed to all CMC/95 attendees at the conference and thus publicly available no later than May 24, 1995. Ex. 1026, ¶11. CMC/95 was attended by individuals active in the area of multimodal communications and spoken language technologies, including at least 50 people. Ex. 1026, ¶¶6,13; Ex. 1027, ¶6. Non-attendees working in the field would have known of the conference because the number in the field was not very large and the conference was well publicized. Ex. 1026, ¶¶13-14; Ex. 1027, ¶¶6-7. Thus, Cheyer was publicly available, and specifically was distributed to researchers in the field of natural language processing and multimodal communication, no later than May 24, 1995. Ex. 1026, ¶¶11,15; Ex. 1027, ¶8. *See MIT v. AB Fortia*, 774

F.2d 1104, 1108-09 (Fed. Cir. 1985) (paper presented orally at conference and subsequently distributed to six recipients constitutes "printed publication").

In addition to dissemination at CMC/95, Cheyer was also publicly available in libraries before the critical date.

<u>WorldCat</u>

The 1995 Proceedings Publication was entered into the WorldCat library catalog on August 4, 1995, indicating that the publication was available in at least one library by September 1995. Ex. 1030, ¶¶19,35-36; Attachment1f. The catalog entry was searchable at least by title and conference name (which was descriptive of the content), or the organizer's name (Harry Bunt). Ex. 1030, ¶35; Attachment1f.

<u>Netherlands Royal Library</u>

The 1995 Proceeding Publication, including Cheyer is publicly available from the Netherlands Royal Library ("NRL"). Ex. 1028. NRL received the 1995 Proceedings Publication on August 8, 1996 and cataloged it on September 13, 1996. *Id*., ¶¶8-9. Beginning on that date, Cheyer was available to the public and could be found by searching via author, descriptive title, or keywords. *Id*., ¶¶6,9. Thus, Cheyer was also cataloged, searchable, and accessible to the interested public at NRL at least by September 13, 1996. *Id*.

<u>Institute for Perceptual Research</u>

Cheyer has also been publicly available at the library at the Institute for Perceptual Research (or Instituut Voor Perceptie Onderzoek) – whose holdings were subsequently transferred to the library of Eindhoven University of Technology – since at least 1996. Ex. 1026, ¶¶12. The copy of the 1995 Proceedings Publication held at the main library of Eindhoven University of Technology bears markings indicating that it was received, indexed, and cataloged by the Institute for Perceptual Research at Eindhoven at least by 1996. *Id*. The library at the Institute for Perceptual Research at Eindhoven was open to the public, including those of ordinary skill in the art and maintained a catalog of publications that allowed searching on title, author, or keyword. *Id*. Accordingly, Cheyer was cataloged, searchable, and accessible to the interested public at the Institute for Perceptual Research library at least by 1996. *Id*.

SRI Website

Cheyer was also publicly available on the SRI website (http:/www.ai.sri.com:80/~cheyer/papers/mmap/mmap.html), bearing a date of August 12, 1996. Ex. 1029. The Internet Archive captured and made an archival copy publicly available, starting with the abstract and hyperlinked table of contents, with each page of the article navigable via linked pages. *Id*. Each of the pages was captured and made publicly available no later than August 8, 1997 *Id*. SRI was known in the field of natural language processing and multimodal communication and it was common for those of ordinary skill to review and reference SRI publications and other documents (Ex. 1026, ¶¶ 16-17; Ex. 1027, ¶¶9-10). A person of ordinary skill in the art ("POSA") exercising reasonable diligence, would have been able to find the Cheyer paper on the SRI website.

Republication

In 1998, Cheyer was republished in Multimodal Human Computer Communication: Systems, Techniques, and Experiments, Harry C. Bunt et al. eds., in Lecture Notes in Artificial Intelligence 1374 (Berlin: Springer, 1998), (hereinafter, "1998 Proceedings Publication"). Ex. 1030, Attachment 1d. The 1998 Proceedings Publication is held in 10 libraries world-wide, and library records for it were created on April 29, 1998. *Id*., ¶37. Accordingly, it was publicly available in at least one library by at least May 1998. *Id*., ¶38. One library's copy is stamped June 25, 1998. *Id*., Attachment1d, p.5. The 1998 Proceedings Publication could be found by searching for: (1) the descriptive title; (2) the descriptive conference name; and (3) the name of the Springer series (Lecture notes in computer science). *Id*., ¶37. Thus, the 1998 Proceedings Publication was publicly available no later than May 1998. *Id*., ¶¶37-38.

Highly-Cited

Public availability of Cheyer is corroborated by the numerous researchers spanning companies and timeframe that cited to Cheyer in their own publications from 1997-1998. *See* Exhibits 1020 – 1025 (published articles citing Cheyer). One such article was entitled "Development Tools for the Open Agent Architecture" published in the Proceedings of the First International Conference on the Practical Application of Intelligent Agents and Multi-Agent Technology (PAAM 96), which was publicly available in 1997. *See* Exhibit 1031 (declaration of Ted Baldwin, establishing public availability of PAAM 96 at Exhibit A by November 17, 1997).

Updates to Cheyer

The authors of Cheyer made formatting changes between May 1995 and May 1998, with no relevant substantive changes to the disclosure. Petitioners include a redline comparison between the text of the 1995 Proceedings Publication and 1998 Proceedings Publication at Exhibit 1032. Petitioners are also including a redline comparison between the text of the 1995 Proceedings Publication and the text hosted on the SRI website. Ex. 1033. The SRI website version included one additional paragraph (see pp.3-4) and an acknowledgements paragraph (*see* p.9) not included in the 1995 and 1998 versions, but the Petition relies on neither paragraph. For convenience, throughout the Petition and the Negus Declaration, citations are to the version in the 1995 Proceedings Publication.

Cheyer is available as prior art under at least 35 U.S.C. § 102(b) because it was disseminated on May 24, 1995 at the 1995 Proceedings and was publicly available: (1) as the 1995 Proceedings Publication from at least one library since September 1995, from the NRL since September 13, 1996, and from the Institute for Perceptual Research since 1996; (2) on SRI's Website no later than August 8, 1997; and (3) as the 1998 Proceedings Publication from libraries since May 1998.

Exhibit 1015 — U.S. Patent No. 5,247,580 by Toshiyuki Kimura *et al.*, entitled "Voice-operated remote control system" ("*Kimura*"), filed on July 22, 1992, and issued on September 21, 1993. *Kimura* is available as prior art under at least 35 U.S.C. §§ 102(a), (b), and (e).

Exhibit 1014 — U.S. Patent No. 6,006,227 by Eric Freeman *et al.*, entitled "Document Stream Operating System" ("*Freeman*"), filed on June 28, 1996 and issued on December 21, 1999. *Freeman* is available as prior art under at least 35 U.S.C. §§ 102(a), 102(e).

B. *Grounds for Challenge*

Petitioner requests cancellation of the claims on the following grounds:

1. Claims 1-4, 6, 8-9, 10-13, 15, 17-18, 19-22, 24, and 26-27 are obvious over *Kupiec* with *Cheyer*.

2. Claims 1-4, 6, 8-9, 10-13, 15, 17-18, 19-22, 24, and 26-27 are obvious over *Kupiec* and *Cheyer* with *Kimura*.

3. Claims 6, 15, and 24 are obvious over *Kupiec* and *Cheyer* with *Freeman.*

III. OVERVIEW OF THE '718 PATENT

A. *Summary of the Claimed Subject Matter*

The '718 Patent describes navigating an electronic data source by means of spoken language using one or more "agents." Ex. 1003, at 2:35-38. An object of the invention is to provide "information navigation technology that allows relatively naïve users to navigate and access desired data by means of natural language input." *Id*. at 1:29-32. The system as described is shown below in FIG. 1a.

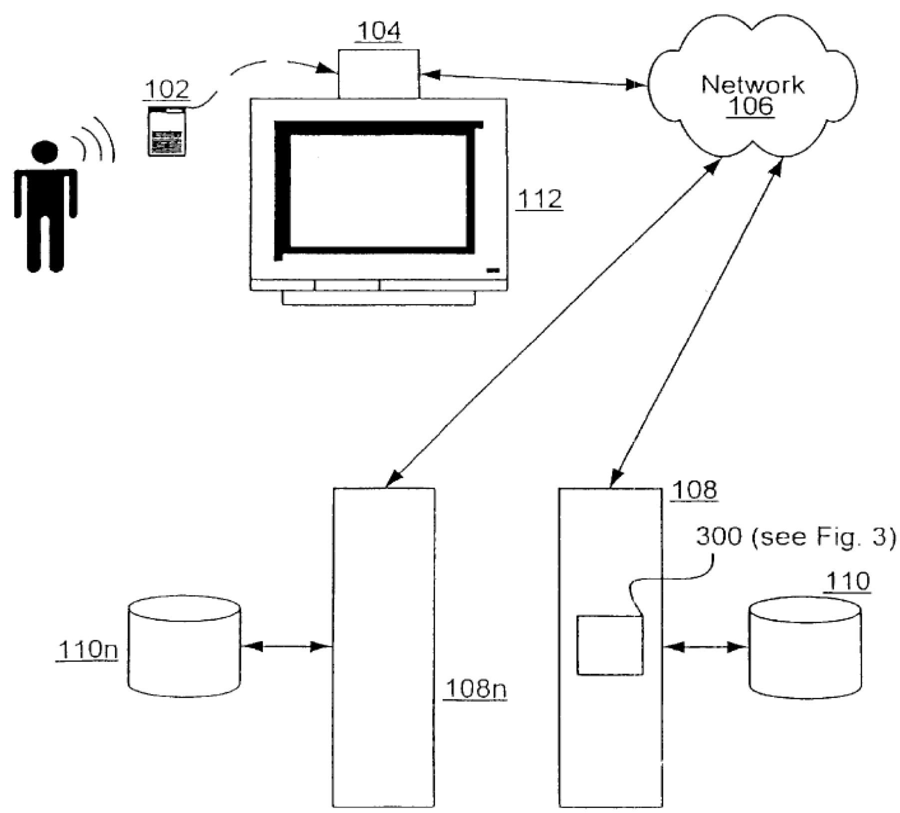


Fig. 1a

Id. at FIG. 1a. A "voice input device" receives voice input data. *Id*. at. 3:56-58. The voice input data is transmitted across a network to be interpreted by "request processing logic." *Id*. at. 4:11-15.

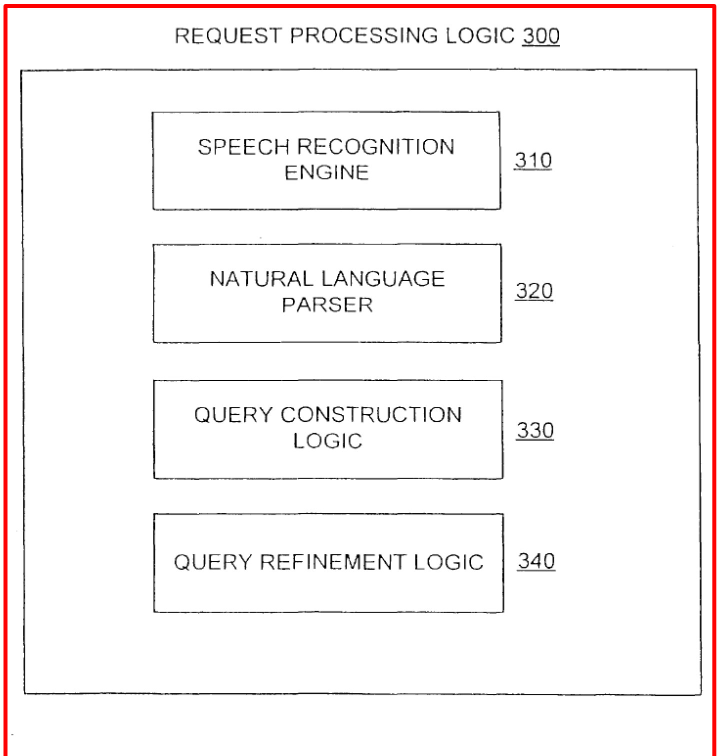


Fig. 3

A "speech recognition engine processes acoustic voice data and attempts to generate a text stream of recognized words." *Id*. at 7:39-41. A "navigation query" is constructed based upon the interpretation of the spoken request. *Id*. at 8:62-64. The "navigation query" is used to "navigate" a remote "data source 110. " *Id*. at 4:30-32.

The '718 Patent discloses a "mobile computing embodiment" of the system, wherein the "voice input device 102, communications box 104, and client display device 112" are replaced by an "integrated, mobile, information appliance 202 such as a cellular telephone or wireless personal digital assistant (wireless PDA)." *Id*. at. 6:2-6.

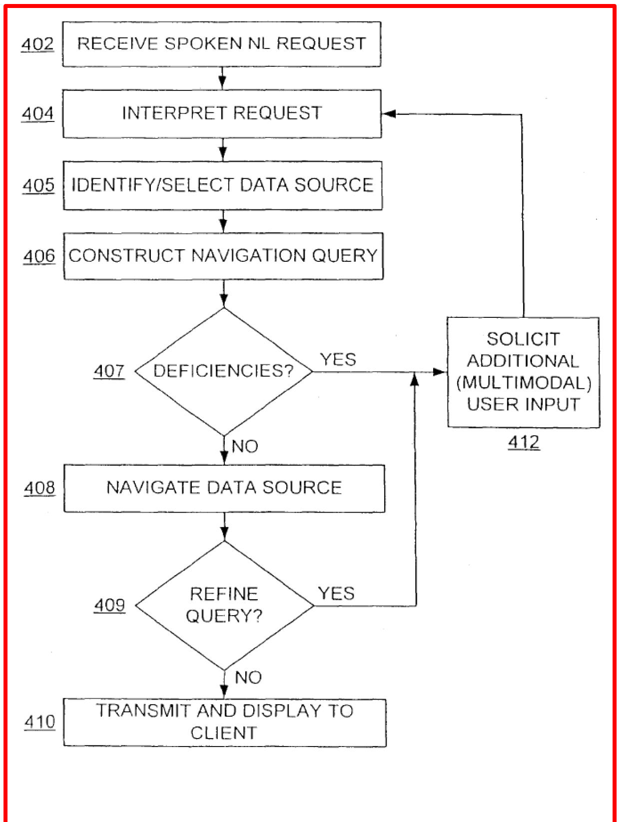


Fig. 4

B. *Prosecution History of the '718 Patent*

The '718 Patent was filed on June 30, 2000, as a continuation of U.S. Patent Application No. 09/524,095, filed on March 13, 2000, which later issued as asserted patent 6,742,021 ("the '021 Patent"). Ex. 1001. The '021 Patent was a continuation-in-part application of application no. 09/225,198, filed on January 5, 1999. Ex. 1007.

During prosecution, the claims faced rejections under 35 U.S.C. § 101 for double patenting rejection over the '021 Patent application. Ex. 1004, p.78. Furthermore, the claims were amended to overcome rejections under 35 U.S.C. §§ 102 and 103, including rejections for both anticipation and obviousness over a prior art reference known as "Levin." *Id*. at 79. Applicants amended the claims to require that the "mobile information appliance comprises a portable remote control device or a set-top box for a television." *Id*. at 155-156.

C. *Priority*

The '718 Patent was filed on June 30, 2000, as a continuation of U.S. Patent Application No. 09/524,095, filed on March 13, 2000, which later issued as the '021 Patent. Ex. 1001. The '021 Patent was a continuation-in-part application of application no. 09/225,198, filed on January 5, 1999. Ex. 1007. The '021 Patent also claims priority to three provisional applications each filed March 17, 1999. Exs. 1009, 1010, 1011. Petitioner disagrees that the '718 Patent is entitled to a priority date any earlier than March 13, 2000, as matter disclosed by the application that issued as the '021 Patent was not present in either the parent application or any of the provisionals. In any event, the claims of the '718 Patent are nevertheless invalid under a priority date of January 5, 1999.

IV. SUMMARY OF PRIOR ART AND REFERENCES RELIED ON

The '718 Patent claims what was well-known in the prior art. None of the prior art discussed below was considered by the Patent Office during prosecution of the '718 Patent.

A. *Brief Summary of Kupiec (Ex. 1013)*

U.S. Patent No. 5,500,920 by Julian M. Kupiec entitled "Semantic co-occurrence filtering for speech recognition and signal transcription applications"

("*Kupiec*") was filed on Sep. 30, 1994, and issued on Mar. 19, 1996. Ex. 1013. *Kupiec* describes transcribing words from a form convenient for input by a human user, e.g., spoken or handwritten words, into a form easily understood by an applications program executed by a computer" including "transcription systems and methods appropriate for use in conjunction with computerized information-retrieval (IR) systems and methods." *Id*. at 1:36-45.

Kupiec discloses a "transducer 20 converts a user's spoken utterance into a signal that can be processed by processor 10." *Id*. at 5:43-6:7. *Kupiec* discloses various functional components implemented as software modules executed by the processor. *Id*. at 6:44-50.

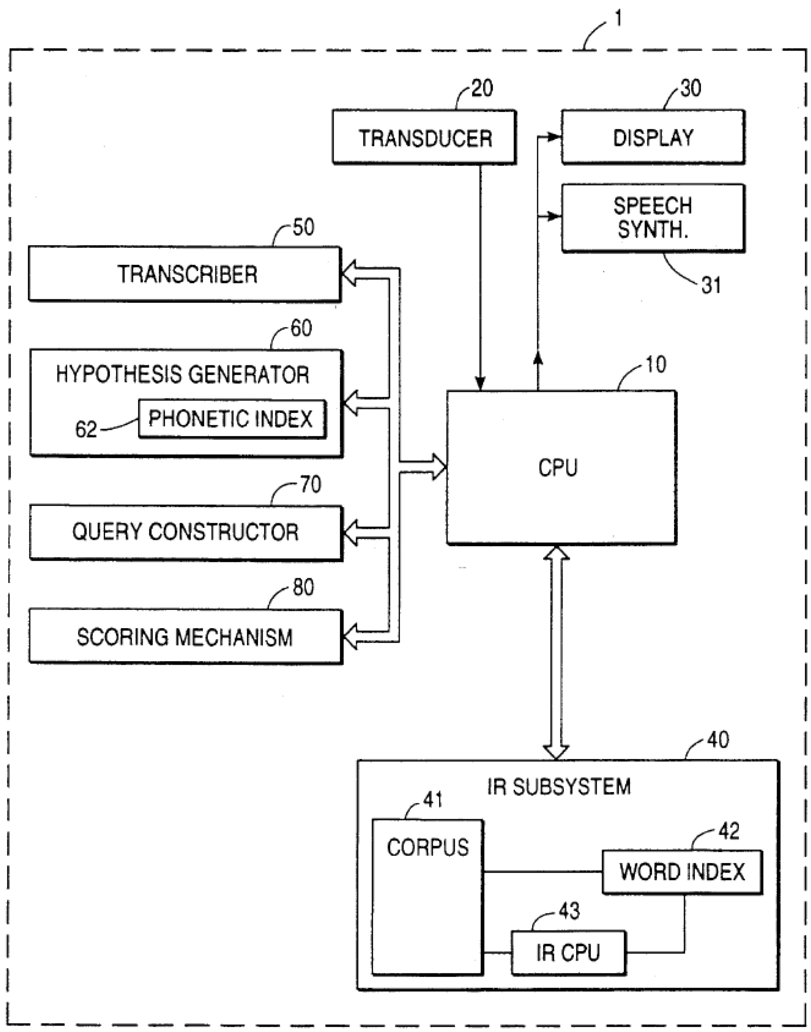


FIG. 1

The processor 10 can be coupled to an IR subsystem 40 including "a processor that can process queries to search for documents in corpus 41." *Id*. at 5:44-48; 6:44-50, FIG. 4. The corpus "comprises a database of documents that can be searched" via "query operations." *Id*. at 6:29-33; 6:53-7:48.

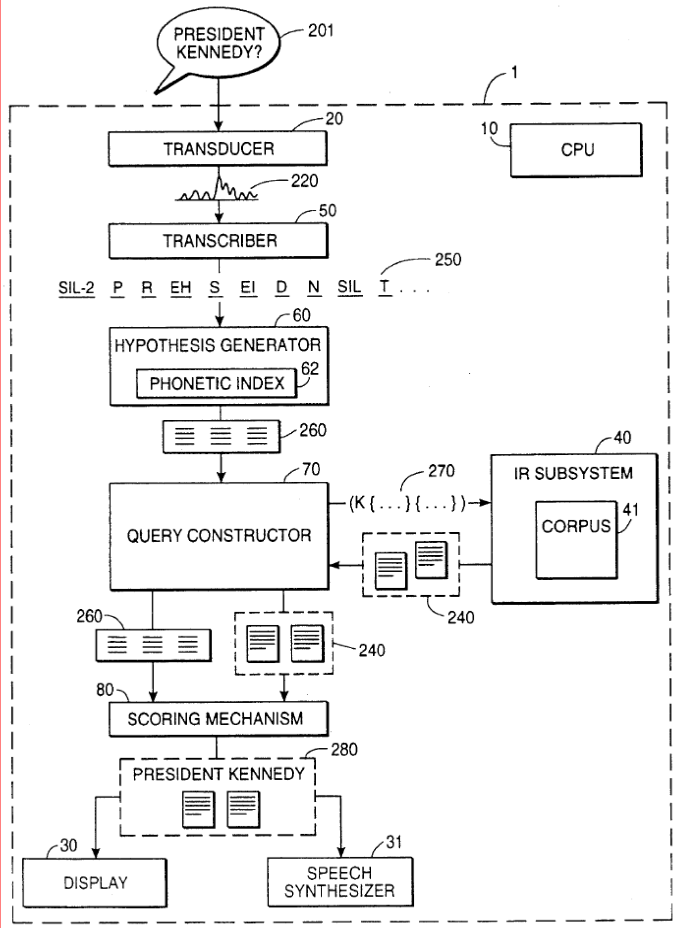


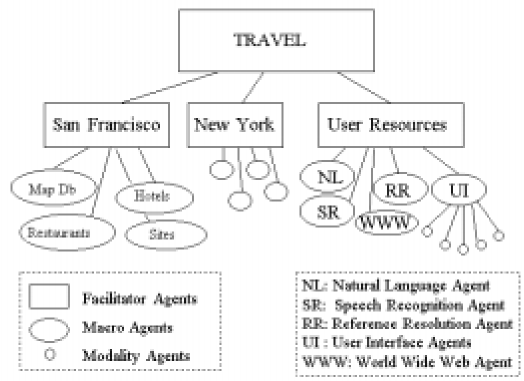
FIG. 2

Kupiec's Fig. 2 shows a user "inputs a question 201 into system 1 by speaking ... where it is converted into a phonetic transcription 250." *Id*. at 9:18-23. Thereafter, the "phonetic transcription 250 is provided to hypothesis generator 60 where it is matched using phonetic index 62 to generate a set of hypotheses 260." *Id*. at 9:38-61. "Query constructor 70 uses the hypotheses 260 to construct one or more queries 270 that will be sent to IR subsystem 40 for execution." *Id*. at 11:10-13. "The execution of the initial and any additional queries causes a set of documents 240 to be retrieved from corpus 41." *Id*. at 11:53-60. Finally, "the results 280 can be presented to the user using processor 10 in conjunction with visual display 30." *Id*. at 12:34-42.

B. *Brief Summary of Cheyer (Ex. 1019)*

Cheyer describes a "prototype map-based application for a travel planning domain." Ex. 1019, p.2. A user can utilize a "synergistic combination of several input modalities" to search the map application on a mobile device, such as a "pen-equipped PC's or a Dauphin handheld PDA." *Id*. at 1,5. Furthermore, the system is "connected either by modem or ethernet to a server machine which will manage database access, natural language processing and speech recognition for the application." *Id*. at 5-6.

Cheyer discusses the modification of the existing "Open Agent Architecture" ("OAA"). *Id*. at 6. The OAA uses a "a hierarchical configuration where client agents connect to a 'facilitator' server." *Id*. at 7. The 'facilitator' "records the published functionality of their sub-agents, and when queries arrive in Interagent Communication Language form, they are responsible for breaking apart any complex queries and for distributing goals to the appropriate agents." *Id*.



As seen in Fig. 3, *Cheyer* describes several specific OAA agents used by the system. *Id*. at 8-9. The "Interface Agent" manages "what is currently being displayed to the user," and accepts the user's multimodal input. *Id*. at 9.

In an example use case, *Cheyer* describes: a "user speaks: 'How far is the restaurant from this hotel?'" *Id*. Then, the request is sent to the "natural language agent" and "translated into ICL form." *Id*. at 10. The "interface agent uses contextual structures to find what 'the restaurant' refers to, and waits for the user to make a gesture indicating 'the hotel', issuing prompts if necessary." *Id*. Finally, the "domain agent (RR) sends database requests asking for the coordinates of the items in question, ...calculates the distance according to the scale of the currently displayed map, and requests the user interface to produce output displaying the result of the calculation." *Id*.

C. *Brief Summary of Kimura (Ex. 1015)*

Kimura teaches a "voice-operated remote control system comprising a microphone for entering a voice command, speech recognition means for comparing a pattern of the entered voice command with a predetermined standard pattern to recognize the contents of the voice command," and "transmitting means for generating and transmitting a remote control signal corresponding to the command data based on the result of recognition." Ex. 1015, at 1:59-66.

D. *Brief Summary of Freeman (Ex. 1014)*

Freeman "relates to an operating system in which documents are stored in a chronologically ordered 'stream.'" Ex. 1014 at 1:4-6. Specifically, *Freeman* teaches "managing personal electronic information which uses a time-ordered stream as a storage model and streams and filters to organize, locate, summarize and monitor incoming information." *Id.* at 3:62-65. Users may "access their personal document streams from any available platform such as a UNIX machine… a personal digital assistant (PDA), or a set-top box via cable." *Id.* at 2:56-61.

V. CLAIM CONSTRUCTION

Because the ’718 Patent will expire before the conclusion of this proceeding, Petitioner has applied the *Phillips* standard. However, the *Phillips* standard for claim construction falls within the “broadest reasonable interpretation” standard generally applied in *inter partes* review proceedings. *See Facebook, Inc. v. Pragmatus AV, LLC*, 582 F. App'x 864, 869 (Fed. Cir. 2014) (“[BRI] may be the same as or broader than the construction of a term under the Phillips standard. But it cannot be narrower.”); *see also* 37 C.F.R. § 42.100(b).[1]

A. *Level of Ordinary Skill in the Art*

A person of ordinary skill in the art would have at least a Bachelor of Science in Computer Science, Computer Engineering, Electrical Engineering, or an equivalent field as well as at least 2 years of academic or industry experience in any type of network equipment field. Ex. 1012, ¶ 29.

B. *Preambles of independent claims 1, 10, and 19 are limiting.*

Petitioner contends the preamble of independent claims 1, 10, and 19 is limiting.

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[1] Petitioner reserves the right to seek different claim constructions than those determined or sought in a different forum (e.g., the District Court Action) that applies different standards of proof and analysis.

The preamble of the independent claims contains the antecedent basis for at least the claim terms: "an electronic data source" and "one or more network servers located remotely from a user" in claims 1, 10, and 19 and "a mobile information appliance" in claims 1 and 10. *See* Ex. 1003 at Claims 1, 10, and 19. These terms appear in the body of claims, and thus the preamble is essential to understand limitations in the claim body. Ex. 1012, ¶78.

The preamble of the claims also provides context to the claims. The '718 Patent recognizes that there was a design decision between performing tasks locally and performing them on a remote server. *Id.*, ¶79. In particular, the Patent states that "[t]he interpretation of the spoken request can be performed on a computing device locally with the user... or remotely from the user". *See, e.g.*, Ex. 1003, at 2:44-46; Ex. 1012, ¶79. The '718 Patent therefore teaches that the electronic network data sources are remote from the user, thereby requiring transmission to reach the client device of the user. Ex. 1012, ¶79.

C. "*navigation query*" (Claims 1, 4, 10, 13, 19, and 22)

The '718 Patent explicitly defines "navigation query," as "an electronic query, form, series of menu selections, or the like; being structured appropriately so as to navigate a particular data source of interest in search of desired information." Ex. 1003, at 8:65-9:1. The "navigation query … includes whatever content and structure is required…to access desired information electronically from a particular database or data source of interest." *Id.* at 9:1-5. Therefore, "navigation query" is "an electronic query, form, series of menu selections, or the like; being structured appropriately so as to navigate a particular data source of interest in search of desired information."

D. "*mobile information appliance*" (Claims 1-3, 8, 10, 12, 17, 19, 21, and 26)

The independent claims all expressly recite that the "mobile information appliance comprises a portable remote control device or a set-top box for a television" and further that the portion of the electronic data source that is selected by the constructed navigation query from the user's spoken request is transmitted "to the mobile information appliance of the user." *See, e.g.* cl. 1, abstract.

By contrast, the specification describes a "mobile computing embodiment" of the disclosed system wherein "voice input device 102, communications box 104, and client display device 112" are replaced by an "integrated, mobile, information appliance 202 such as a cellular telephone or wireless personal digital assistant (wireless PDA)." Ex. 1003, at 6:2-6; 2:38-40. The "mobile information appliance" receives the user's spoken request, wirelessly transmits the request to a server, and receives the retrieved information to display "on the display of the information appliance" or "through the appliance's speakers." *Id*. at 6: 8-19. The specification states that some of the request processing logic could be implemented locally on the appliance. *Id.* at 6:20-29. The specification, however, never describes the "mobile information appliance" as comprising "a set-top box for a television" as claimed.

During prosecution of the ’718 Patent, the applicants argued that the prior art Levin reference failed to teach or suggest a “mobile information appliance.” Ex. 1004, p.101. Applicants affirmatively stated “the very essence of a mobile appliance is its portability, small size, and ease of use. As such, unlike hard-wired appliances, mobile appliances are not equipped with large bulky input devices” *Id*. Dr. Negus explains that the applicant’s reference to hard-wired appliance is in contrast to battery-powered devices of the time. Ex. 1012, ¶84. Thus, Applicants disclaimed subject matter other than appliances that are battery-powered, small, and portable. This is directly in contrast to the language of the claims that the “mobile information appliance comprises . . . a set-top box for a television.”

Given the claim, the specification, and the prosecution history, the interpretation of this term is “a battery-powered and portable integrated information processing device.” Ex. 1012, ¶84. To the extent that the Board does not find that the claim is limited by the specification and disclaimer of Applicant’s argument, the claims are equally invalid under the claims as written for the reasons presented below.

E. *“mobile information appliance comprises a portable remote control device or a set-top box for a television”* (Claims 1, 10, and 19)

Petitioner contends that “for a television” modifies only “set-top box” and not “portable remote control device,” which could include a PDA or cell phone. *See, e.g.*, Ex. 1003, at 6:4-6, c.7-9,16-18,25-27; Ex. 1012, ¶859.

In the related litigation, Patent Owner takes the position that this element is satisfied by the combination of a "set-top box for a television [Hopper 3 / 4k Joey set-top box products] and a portable remote control device [Voice Remote]" where a spoken request at the remote control "such as a spoken request for particular television programming" is used to, select data from a network server which is transmitted to the "Voice Remote with Hopper 3/ 4k Joey set-top box products". Ex. 1016, p.13-15. Based on the correct construction of "mobile information appliance" (*see supra*), Petitioner disagrees that the claimed functionality of the "mobile information appliance" could be read on the combined operation of these discrete devices. However, to the extent that Patent Owner's assertion to the contrary is within the proper interpretation of this term, petitioner has applied Patent Owner's construction herein to show invalidity under various prior art combinations.

VI. A REASONABLE LIKELIHOOD EXISTS THAT THE CHALLENGED CLAIMS ARE UNPATENTABLE

A. *Ground 1: The '718 Patent Claims 1-4, 6, 8-9, 10-13, 15, 17-18, 19-22, 24, and 26-27 are obvious over Kupiec (Ex. 1013) in view of Cheyer (Ex. 1019).*

1. Independent Claim 1.

1[a].	A method for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, wherein a data link is established between a mobile information appliance of the user and the one or more network servers, comprising the steps of:

Kupiec teaches "transcribing … spoken or handwritten words, into a form easily understood by an applications program executed by a computer, e.g., text." Ex. 1013, at 1:35-45; Ex. 1012, ¶216. The methods can be used "in conjunction with...computerized information-retrieval systems and methods used with textual databases." *Id*. *Kupiec* discloses a "Processor 10" that typically is "part of a mainframe, workstation, or personal computer." Ex. 1013, at 5:52-55; Ex. 1012, ¶218. Furthermore, *Kupiec* teaches applicability of its techniques to "pen-based computers and personal digital assistants." Ex. 1013, at 1:56-67; Ex. 1012, ¶217.

Figure 1 of *Kupiec* shows processor 10 coupled to an IR subsystem 40 including contains a corpus 41 which "comprises a database of documents that can be searched." Ex. 1013, at 5:43-51; 6:29-33; Ex. 1012, ¶219. The "IR Subsystem 40 can be located at the same site as processor 10 or can be located at a remote site and connected to processor 10 via a suitable communication network." Ex. 1013, at 6:25-28; Ex. 1012, ¶219. Therefore, *Kupiec* discloses this preamble. Ex. 1012, ¶221.

To the extent *Kupiec* does not explicitly disclose "a data link is established between a mobile information appliance of the user and the one or more network servers," this feature is disclosed by *Cheyer*. *Cheyer* teaches a system for "synergistic combination of handwriting, gesture, and speech modalities; access to existing data sources including the World Wide Web; and a mobile handheld interface." Ex. 1019, p.2; Ex. 1012, ¶223. The "user interface runs on pen-equipped PC's or a Dauphin handheld PDA." Ex. 1019, p.5-6; Ex. 1012, ¶226. *Cheyer*'s interface is "connected either by modem or ethernet to a server machine which will manage database access, natural language processing and speech recognition for the application." *Id*. Therefore, *Cheyer* teaches "a data link is established between a mobile information appliance of the user and the one or more network servers." Ex. 1012, ¶228.

Motivation to Combine *Kupiec* and *Cheyer*.

A POSA would have used the voice-searching method disclosed by *Kupiec* on a mobile handheld interface wherein a data link is established between the mobile device and a network server as disclosed by *Cheyer* for several reasons. Ex. 1012, ¶231. A POSA at the time of the invention would have been specifically motivated to combine *Kupiec* with *Cheyer* because both references are directed to solving the problem of retrieval of information from remote electronic sources based upon an initial user inquiry made via spoken language that upon transcription is prone to errors and/or ambiguities. Ex. 1012, ¶232. The presence of similar errors and/or ambiguities is unsurprising as both references rely on the hidden Markov as the basis for their basic speech transcription technology. Ex. 1012, ¶¶233-234.

Implementing the method of searching a remote database using spoken language as disclosed by *Kupiec* on a mobile device connected to a network server via data link as disclosed by *Cheyer* would have been obvious to a POSA. *Kupiec* discloses the use of a portable voice input device, a Sennheiser headset. Ex. 1012, ¶236. Furthermore, *Kupiec* acknowledges that the use of PDAs was known at the time, and suggests that issues with "error-prone transcription of user input" extend to such mobile devices, therefore suggesting to a POSA that *Kupiec*'s implementation of a voice-searching methodology would be appropriate for a mobile device. Ex. 1012, ¶217. Further, nothing in *Kupiec* teaches away or excludes the use of a mobile information appliance. Ex. 1012, ¶236.

A POSA would have looked to *Cheyer*'s disclosure of a mobile handheld interface because the use of mobile devices was increasingly popular at the time of the claimed invention. Ex. 1012, ¶235.

Kupiec discloses searching a remote database via spoken input using a portable voice input device (headset) and a personal computer. Ex. 1012, ¶236. Thus, a POSA would find a high likelihood of success in implementing the speech-recognition systems in conjunction with computerized information-retrieval systems as disclosed by *Kupiec* on a mobile information appliance as disclosed by *Cheyer* because portable computing devices were well-known at the time, so it would be simply improving a similar device in the same way. *Id*.

Therefore, *Kupiec* in view of *Cheyer* renders the above claim limitation obvious. Ex. 1012, ¶237. As to all obviousness grounds herein, secondary considerations do not support a finding of nonobviousness. Patent Owner has not identified any evidence of Secondary Considerations.

1[b].	(a) receiving a spoken request for desired information from the user utilizing the mobile information appliance of the user, wherein said mobile information appliance comprises a portable remote control device or a set-top box for a television;

Kupiec teaches the "user inputs a question 201 into system 1 by speaking into audio transducer 20" which converts a user's spoken utterance into a signal that can be processed by processor 10." Ex. 1013, at 5:56-6:1, 9:18-23, Fig. 1; Ex. 1012, ¶¶239-240. The "processer 10 is a computer processing unit (CPU)" that typically is "part of a mainframe, workstation, or personal computer." Ex. 1013, at 5:52-55; Ex. 1012, ¶243. Therefore, *Kupiec* discloses receiving a spoken request for desired information from the user. Ex. 1012, ¶246.

To the extent *Kupiec* does not explicitly teach the use of a "mobile information appliance, wherein said mobile information appliance comprises a portable remote control device or a set-top box for a television," this feature is disclosed by *Cheyer*. *Cheyer* teaches a "mobile system" that "runs on pen-equipped PC's or a Dauphin handheld PDA." Ex. 1019, p.5-6; Ex. 1012, ¶252. The Dauphin PDA is small, portable, and battery-powered. Ex. 1012, ¶¶155,156. This corresponds to the '718 Patent's description of implementation "with an integrated, mobile, information appliance 202 such as a cellular telephone or wireless personal digital assistant (wireless PDA)." Ex. 1003, 5:67-6:6.

In Fig. 1, *Cheyer* discloses that "the user" is "presented with a pen sensitive map display" and can provide "spoken input" and the "user may ask the map to perform various actions" such as "information retrieval." Ex. 1019, p.5; Ex. 1012, ¶250. *Cheyer*'s PDA is portable and remotely controls the database on the server machine, and further can be used to control the electronic data source as described in *Kupiec*. Ex. 1012, ¶256. Therefore, Cheyer teaches "receiving a spoken request for desired information from the user utilizing the mobile information appliance of the user," wherein the PDA disclosed by *Cheyer* constitutes a portable remote control device. Ex. 1012, ¶254.

As above, a POSA would have been motivated to implement the step of "receiving a spoken request for desired information from the user" as disclosed by *Kupiec* on the mobile device disclosed by *Cheyer* for many reasons, and would have had a high expectation of success in doing so. *See supra* Element 1[a]. *Kupiec* also suggests applicability to "pen-based computers and personal digital assistants." Ex. 1013, at 1:56-67; Ex. 1012, ¶242.

1[c].	(b) rendering an interpretation of the spoken request;

Kupiec teaches that the signal "produced by transducer 20 is fed to transcriber 50, where it is converted into a phonetic transcription 250." Ex. 1013, at 9:18-31; Ex. 1012, ¶273. *Kupiec* defines "phonetic transcription 250" as "an ordered sequence of phones, that is, of component sounds that can be used to form words." *Id*. Therefore, as explained by Dr. Negus, *Kupiec* teaches this limitation. Ex. 1012, ¶277.

1[d].	(c) constructing a navigation query based upon the interpretation;

Kupiec discloses that "phonetic transcription 250 is provided to hypothesis generator 60 where it is matched using phonetic index 62 to generate a set of hypotheses 260." Ex. 1013, at 9:38-61; Ex. 1012, ¶287. A query constructor "uses the hypotheses 260 to construct one or more queries 270 that will be sent to IR subsystem 40 for execution." Ex. 1013, at 11:11-13; Ex. 1012, ¶287. These are "formulated in a query language that expresses Boolean, proximity, and ordering or sequence relationships between search terms." Ex. 1013, at 6:54-56; Ex. 1012, ¶288. Therefore, *Kupiec* teaches this limitation. Ex. 1012, ¶292.

1[e].	(d) utilizing the navigation query to select a portion of the electronic data source; and

IR Subsystem 40 "executes [the queries] by conducting searches in accordance with queries 270 over corpus 41." Ex. 1013, at 11:53-60; Ex. 1012, ¶307. This "causes a set of documents 240 to be retrieved from corpus 41." *Id*. *Kupiec* also describes that "[d]epending on the results obtained from execution of the initial query, additional queries can be constructed and executed, to "send the query thus modified back to IR subsystem 40 to be executed again." Ex. 1013, at 11:42-48; Ex. 1012, ¶304. Therefore, *Kupiec* teaches this limitation. Ex. 1012, ¶310.

1[f].	(e) transmitting the selected portion of the electronic data source from the network server to the mobile information appliance of the user.

Kupiec provides that "IR subsystem 40 can be located at the same site as processor 10 or can be located at a remote site and connected to processor 10 via a suitable communication network." Ex. 1013, at 6:25-28; Ex. 1012, ¶320. In *Kupiec*, the "[d]isplay 30 provides visual output to the user" such as for "documents retrieved from corpus 41" and typically comprises "a computer screen or monitor." Ex. 1013, at 6:12-15; Ex. 1012, ¶321. *Kupiec* additionally discloses sending "interpretation 400 to be displayed using a visual display 231" in order "to facilitate the understanding of the inputs that the user provides as relevance feedback." *Id*. Thus, *Kupiec* discloses this claim limitation by retrieving documents from an information retrieval subsystem at a remote site over a communications network and displaying the selected documents on a computer screen such as that of a personal digital assistant. Ex. 1012, ¶325.

To the extent *Kupiec* does not explicitly disclose that the selected portion of the electronic data source is transmitted from the network server to a mobile information appliance of the user, *Cheyer* discloses this limitation. *Cheyer* discloses a system that enables "a user" to "transparently access a wide variety of data sources, including information stored in HTML form on the World Wide Web" through a "multimodal interface" that "runs on pen-equipped PC's or a Dauphin handheld PDA." Ex. 1019, p.5; Ex. 1012, ¶328. *Cheyer's* PDA is "connected either by modem or ethernet to a server machine which will manage database access, natural language processing and speech recognition for the application." Ex. 1019, p.5-6; Ex. 1012, ¶226. *Cheyer* further notes that the system has "multimodal (multimedia) output as well as input: video, text, sound and voice can all be combined when presenting an answer to a query." Ex. 1019, p.5; Ex. 1012, ¶251. Thus, *Cheyer* discloses this limitation. Ex. 1012, ¶331.

As above, a POSA would have been motivated to implement the system for searching a remote database using spoken input disclosed by *Kupiec* on a mobile, handheld interface as disclosed by *Cheyer* for many reasons. *See supra* Element 1[a]. Therefore, *Kupiec* in view of *Cheyer* renders the above claim limitation obvious. Ex. 1012, ¶333.

2. Dependent Claims 2-4, 6, and 8-9.

Claims 2 & 3.	The method of claim 1, wherein the step of rendering the interpretation of the spoken request is performed by the mobile information appliance.

Kupiec teaches that the "[p]rocessor 10 is a computer processing unit" that can be part of a "personal computer," but can comprise "multiple processing elements in some embodiments." Ex. 1013, at 5:52-55; Ex. 1012, ¶336. Furthermore, *Kupiec* suggests extensibility to "pen-based computers and personal digital assistants," and was "demonstrated on a Sun SparcStation 10 workstation" with voice input "using a Sennheiser HMD414 headset microphone …with signal processing performed in software by the SparcStation." Ex. 1013, at 29:45-46; Ex.

1012, ¶¶338-339. As explained by Dr. Negus, a POSA would recognize the SparcStation 10 workstation with a headset microphone to be an example of a computing device that can be co-located with the user, and therefore *Kupiec* discloses the limitation that such rendering be performed at "the mobile information appliance" to the extent that "the mobile information appliance" is the computing device, such as a personal computer or a PDA. *Id*.

To the extent that *Kupiec* does not explicitly disclose that the step of rendering the interpretation of the spoken request is performed by the mobile information appliance, *Cheyer* discloses this limitation. *Cheyer* teaches that "agents are distributed entities that can run on different machines, and communicate together to solve a task for the user." Ex. 1019, p.8; Ex. 1012, ¶345. *Cheyer* describes a "Speech Recognition (SR) Agent" and a "Natural Language (NL) Parser Agent." Ex. 1019, p.8; Ex. 1012, ¶347. The "user interface runs on pen-equipped PC's or a Dauphin handheld PDA." Ex. 1019, p.5; Ex. 1012, ¶348. Therefore, *Cheyer* discloses that the step of rendering the interpretation of the spoken request is performed by a computing device, wherein the distributed system can be implemented on a handheld PDA. Ex. 1012, ¶350.

It would have been obvious to a POSA to utilize *Kupiec's* search system on a mobile device as disclosed by *Cheyer* to perform the step of rendering the interpretation of the spoken request. *See supra* §VI.A.1, Element 1[a]; Ex. 1012, ¶351. In addition to the reasons provided above, the '718 Patent admits that "practitioners will understand" that "it is possible to divide and allocate the functional components of request processing logic 300 between client and server" such as "speech recognition—in entirety, or perhaps just early stages such as feature extraction—might be performed locally on the client end, perhaps to reduce bandwidth requirements." Ex. 1003, at 6:49-56; Ex. 1012, ¶351. Moreover, a POSA would understand that for systems such as *Kupiec* in view of *Cheyer*, the only logical choices for performing such step of "rendering an interpretation" would be either "on a computing device located locally with the user" or "on a network computing device located remotely from the user," and that both were feasible and obvious. Ex. 1012, ¶351.

Claim 4[a].	The method of claim 1, further comprising the steps of soliciting additional input from the user, including user interaction in a modality different than the original request;

Kupiec teaches "transcriber 50 is error-prone and produces a phonetic transcription 250 that is imperfect" and therefore "hypothesis generator 60 develops alternative possible transcriptions for each word spoken." Ex. 1013, at 9:35-61; Ex. 1012, ¶369. Hypothesis generator 60 may also "prompt the user to repeat the question" in response to perceived imperfections. Ex. 1013, at 11:1-9; Ex. 1012, ¶369. *Kupiec* further teaches that "the user can provide relevance feedback based on displayed or speech-synthesized output." Ex. 1013, at 27:13-15. "After the user's question has been processed, so that documents have been retrieved and presented in response to the question, the user has the option of directing the invention to perform a follow-up search based on the retrieved results." Ex. 1013, at 19:32-36; Ex. 1012, ¶370. In this scenario, "the best matching documents that correspond at any time to the words that the user has spoken so far can be displayed to the user on a screen" and the user can provide additional feedback, such as causing particular documents "to be excluded by invoking the NOT operation." Ex. 1013, at 19:64-20:2; Ex. 1012, ¶370.

Although *Kupiec* does not expressly state that the feedback is via a non-spoken modality, *Kupiec* teaches the invention "is adaptable to a range of input sources." Ex. 1013, at 23:19-20; Ex. 1012, ¶371. In Figure 11, *Kupiec* discloses a multi-modal interface, including "transducer 220 accepts an input question 301" that "can be a spoken utterance." Ex. 1013, at 24:22-38; Ex. 1012, ¶372. Alternatively, input may "be a phrase handwritten with a pen or styles" or a "typewritten character sequence." *Id*. The multi-modal interface is used in processing "relevance feedback commands." Ex. 1013, at 27:7-18; Ex. 1012, ¶373. The user may "provide relevance feedback based on displayed or speech-synthesized output ... to facilitate the understanding of the inputs that the user provides as relevance feedback." *Id*. Therefore, *Kupiec* teaches or suggests "soliciting additional input from the user, including user interaction in a modality different than the original request." Ex. 1012, ¶375.

To the extent that *Kupiec* does not disclose that the additional input is via a modality different than the original request, this feature is disclosed by *Cheyer*. *Cheyer* discusses combinations of input modalities, explaining that "direct manipulation and natural language seem to be very complementary modalities" and that "[a] number of systems have focused on combining the speed of speech with the reference provided by direct manipulation of a mouse pointer." Ex. 1019, p.3-4; Ex. 1012, ¶377. *Cheyer* discloses a "system [that] permits the user to simultaneously combine direct manipulation, gestural drawings, handwritten, typed and spoken natural language." Ex. 1019, p.4-5; Ex. 1012, ¶378.

The system operates using "modality agents [that] are connected to an 'interpret agent' which is responsible for combining the inputs across all modalities to form a valid command for the application." Ex. 1019, p.7; Ex. 1012, ¶380. This interpret agent also "receives filtered results from the modality agents, sorts the information into the correct fields, performs type-checking on the arguments, and prompts the user for any missing information." *Id*. The system further comprises an "Interface Agent ... responsible for managing what is currently being displayed to the user, and for accepting the user's multimodal input." Ex. 1019, p.9; Ex. 1012, ¶381. *Cheyer* explains "[a]n important task for the interface agent is to record which objects of each type are currently salient, in order to resolve contextual references such as 'the hotel' or 'where I was before.'" Ex. 1019, p.9; Ex. 1012, ¶382. Any "[d]eictic references are resolved by gestural or direct manipulation commands." *Id*. If the user does not provide the relevant gestural or direct manipulation commands within a predetermined waiting period, the system "prompts the user for it." *Id*. For example, *Cheyer* discloses a scenario wherein "[a] user speaks: 'How far is the restaurant from this hotel?'" Ex. 1019, p.9-10; Ex. 1012, ¶383. After an initial attempt to resolve this request, "[t]he interface agent uses contextual structures to find what 'the restaurant' refers to, and waits for the user to make a gesture indicating 'the hotel', issuing prompts if necessary." *Id*.

Accordingly, *Cheyer* discloses "soliciting additional input from a user" by prompting the user to provide missing information or to resolve deictic differences. Ex. 1012, ¶345. This additional input "includ[es] user interaction in a modality different than the original request" by prompting the user for additional information in non-spoken modalities such as handwriting, gestures, or direct manipulation by mouse pointer or typing. *Id*. Therefore, *Cheyer* discloses all limitations of this element. Ex. 1012, ¶386.

A POSA would have been motivated to modify the system of *Kupiec* with the input modality system of *Cheyer* for each of the reasons detailed above with respect to Claim 1. *See supra* §VI.A.1. Importantly, both *Kupiec* and *Cheyer* acknowledge that because of these errors and/or ambiguities, the speech recognition and subsequent information retrieval processes would benefit from the solicitation of additional input from the user. Ex. 1013, at 19:64-20:2; Ex. 1019, p.10; Ex. 1012, ¶391. Further, both references acknowledge the possibility of multiple user input modalities, including non-spoken modalities. Ex. 1013, at 19:64-20:2; Ex. 1019, p.2-4. Nothing in *Kupiec* suggests that soliciting feedback via non-spoken modalities would be inappropriate or impossible. Ex. 1012, ¶376. Additionally, *Cheyer* itself teaches and motivates the desirability of multi-modal user interfaces, and it would be obvious to improve *Kupiec*'s relevance feedback techniques in this manner. Ex. 1019, p.2-3; Ex. 1012, ¶392. For instance, *Cheyer* teaches that "multiple input modalities … produce more natural user interfaces." Ex. 1019, p.1. Thus, it would have been obvious to use the multi-modal interface of *Cheyer* to solicit additional relevance feedback from the user of *Kupiec*, to refine or improve the returned results.

For instance, *Kupiec* describes "the best matching documents …can be displayed to the user on a screen [and] …the user can speak additional words to direct the search to particular documents or cause them to be excluded by invoking the NOT operation." Ex. 1013, at 19:64-20:2; Ex. 1012, ¶370. It would have been obvious to a POSA to implement the relevance feedback process of *Kupiec* to allow the user to supply additional input in the form of other non-spoken modalities, such as prompting the user to enter gestures or direct manipulation commands within a predetermined waiting period as taught by *Cheyer*. Ex. 1019, p.10; Ex. 1012, ¶382. For example, a POSA would have found it obvious to implement the "NOT operation" of *Kupiec* using "remove" non-speech gesture as depicted in Figure 2 of *Cheyer*. Ex. 1013, at 19:64-20:2; Ex. 1019, p.11; Ex. 1012, ¶391.

Finally, given the overall similarity of the systems of *Kupiec* and *Cheyer*, a POSA would also view the combination *Cheyer's* multi-modal feedback with the system of *Kupiec* as very likely to succeed and very predictable. Ex. 1012, ¶394.

Claim 4[b].	refining the navigation query, based upon the additional input;

Kupiec teaches that after "the initial query, additional queries can be constructed and executed, in a process called query reformulation." Ex. 1013, at 11:42-48; Ex. 1012, ¶397. This is "the process of modifying the initial query constructed by query constructor 70 and executing the query thus modified using IR subsystem 40." Ex. 1013, at 15:7-11; Ex. 1012, ¶398. This includes the use of "Relevance feedback commands" wherein "[a]fter the user's question has been processed…the user has the option of directing the invention to perform a follow-up search based on the retrieved results." Ex. 1013, at 19:32-36; Ex. 1012, ¶399. For example, the system incorporates relevance feedback commands into a refined search when the user "direct[s] the search to particular documents or cause[s] them to be excluded by invoking the NOT operation." Ex. 1013, at 19:64-20:2; Ex. 1012, ¶123. *Kupiec* explains "[i]f documents have previously been retrieved, then user relevance feedback commands and search terms can be routed to the hypothesis generator, to instruct the hypothesis generator to use retrieved document titles as the basis for confirming hypotheses." Ex. 1013, at 20:23-27; Ex. 1012, ¶126. Accordingly, *Kupiec* discloses query reformulation "based upon the additional input" such as relevance feedback commands. Ex. 1012, ¶401.

Claim 4[c].	and using the refined navigation query to select a portion of the electronic data source.

Kupiec discloses refining a navigation query based on additional user input. *See supra §* §VI.A.2, at Element 4[a]. After incorporating the relevance feedback, such as the "NOT operation," "[t]he system then can perform operations such as a vector space search or the selection of one among several preferred hypotheses (Step MM)." Ex. 1013, at 20:29-32; Ex. 1012, ¶415. "Results of these operations are presented to the user (Step KK)." *Id*.

Accordingly, *Kupiec* discloses "using the refined navigation query" by the process of searching the information retrieval subsystem or a subset thereof with the refined query incorporating relevance feedback "to select a portion of the electronic data source" such as returning the documents from the information retrieval. Ex. 1012, ¶417.

Claim 6.	The method of claim 1, wherein steps (a)-(d) are performed with respect to multiple users.

Kupiec teaches using a "processor 10" that typically is "part of a mainframe, workstation, or personal computer." Ex. 1013, at 5:52-55; Ex. 1012, ¶¶427, 429. Further, *Kupiec* states that the processor 10 can be connected to the IR subsystem

40 "via a suitable communication network." Ex. 1013, at 6:22-25; Ex. 1012, ¶431. *Kupiec* teaches applicability to to "pen-based computers and personal digital assistants." Ex. 1013, at 1:56-67; Ex. 1012, ¶428.

Therefore, *Kupiec* discloses that the method steps (a) - (d) can be performed with respect to multiple users when the system operates with multiple computerized information-retrieval (IR) systems and multiple computers and personal digital assistants over a suitable communications network. Ex. 1012, ¶433.

To the extent *Kupiec* does not explicitly teach this limitation, *Cheyer* describes the system design criteria as including a "user interface" that is "light and fast enough to run on a handheld PDA while able to access applications and data that may require a more powerful machine." Ex. 1019, p.5; Ex. 1012, ¶437. Similarly, *Cheyer* describes the system as also having a "user interface" that "runs on pen-equipped PC's or a Dauphin handheld PDA." *Id.* "The interface is connected either by modem or ethernet to a server machine which will manage database access, natural language processing and speech recognition for the application." Ex. 1019, p.5-6; Ex. 1012, ¶438. According to *Cheyer*, "databases" capable of being searched by the system can include "Prolog databases, X.500 hierarchical databases, and data loaded automatically by scanning HTML pages from the World Wide Web (WWW)." Ex. 1019, p.8; Ex. 1012, ¶440. Therefore, *Cheyer* discloses that the method can be performed with respect to multiple users as the described mobile system supports multiple users operating multiple PDAs connected via modem or Ethernet to remote databases managed by agents distributed on multiple different machines to handle multiple requests arriving in parallel. Ex. 1012, ¶442.

It would have been obvious to a POSA in light of *Kupiec* and/or *Cheyer* that the claimed method steps could be performed with respect to multiple users. The '718 Patent acknowledges that "Data source 210 (or 100), being a network accessible information resource, has typically already been constructed to support access requests from simultaneous multiple network users, as known by practitioners of ordinary skill in the art." Ex. 1003, at 6:34-38. A POSA would recognize that both the corpus 41 of *Kupiec* and the databases and World Wide Web as disclosed by *Cheyer* are constructed to support requests from multiple users across the "suitable communications network" from either personal computers or PDAs. Ex. 1012, ¶444. Furthermore, nothing in either reference teaches away or excludes the possibility of multiple users utilizing the disclosed method. Ex. 1012, ¶445. Therefore, this claim limitation is obvious over *Kupiec* in view of *Cheyer*.

Claim 8.	The method of claim 1, wherein the mobile information appliance is a portable computing device.
Claim 9.	The method of claim 8, wherein the portable computing device is a personal digital assistant.

Kupiec describes that "Processor 10 is a computer processing unit (CPU)" that typically is "part of a mainframe, workstation, or personal computer." Ex. 1013, at 5:52-55; Ex. 1012, ¶461. Furthermore, *Kupiec* teaches applicability to "pen-based computers and personal digital assistants." Ex. 1013, at 1:56-67; Ex. 1012, ¶¶ 460, 477-478.

To the extent *Kupiec* does not explicitly disclose that the "mobile information appliance comprises a portable computing device," *Cheyer* discloses this limitation. *Cheyer* discloses that the "user interface must be light and fast enough to run on a handheld PDA," such as "pen-equipped PC's or a Dauphin handheld PDA (Dauphin, DTR-1 User's Manual)." Ex. 1019, p.5; Ex. 1012, ¶¶468, 485. Therefore, *Cheyer* discloses these claim limitations because a handheld PDA is a portable computing device, and each qualifies as a "mobile information appliance." Ex. 1012, ¶¶468, 485.

It would have been obvious to a POSA to implement the system for searching a remote database by voice input as disclosed by *Kupiec* on a handheld PDA (also a "portable computing device") as disclosed by *Cheyer*. *See supra* §VI.A.1, Element 1[a]; Ex. 1012, ¶¶472, 489.

3. Independent Claim 10.

Claim 10 differs from Claim 1 only in in that it is a computer program claim implementing particular functionality rather than a method claim directed to that functionality.

10[a].	A computer program embodied on a computer readable medium for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, wherein a data link is established between a mobile information appliance of the user and the one or more network servers, comprising:

See supra §VI.A.1. *Kupiec* describes the operation of a speech-recognition system in conjunction with an information-retrieval system based on the exemplary software modules that execute on a processor within a computer, and includes an appendix containing source code software implementation of a "current embodiment of the invention." Ex. 1012, ¶526; Ex. 1018. *Cheyer* discloses functionality implemented via software agents on a PDA and servers. Ex. 1019, p.5-6; Ex. 1012, ¶507. Therefore, *Kupiec* in view of *Cheyer* discloses a computer program embodied on a computer readable medium that meets this limitation. A POSA would have been motivated to combine the system of *Kupiec* with the mobile information appliance of *Cheyer* for all the reasons disclosed *supra* at Claim 1.

10[b].	(a) a code segment that receives a spoken request for desired information from the user utilizing the mobile information appliance of the user, wherein said mobile information appliance comprises a portable remote control device or a set-top box for a television;
10[c].	(b) a code segment that renders an interpretation of the spoken request;
10[d].	(c) a code segment that constructs a navigation query based upon the interpretation;
10[e].	(d) a code segment that utilizes the navigation query to select a portion of the electronic data source; and
10[f].	(e) a code segment that transmits the selected portion of the electronic data source from the network server to the mobile information

	appliance of the user.

See supra §VI.A.1, Elements 1[b]-[f]. *Kupiec* describes implementation of the disclosed system via software modules containing code segments, and *Cheyer* describes implementation of software agents containing code segments on a mobile information appliance, wherein the PDA disclosed by *Cheyer* functions as a "portable remote control device." *See supra* Element 10[a]; *see also* Ex. 1018. Hence, *Kupiec* in view of *Cheyer* discloses these elements. Ex. 1012, ¶¶ 537,558, 575, 597, 625.

A POSA would have been motivated to combine the system of *Kupiec* with the mobile information appliance of *Cheyer* for all the reasons disclosed with respect to Claim 1. *See supra* §VI.A.1.

4. Dependent Claims 11-13, 15, and 17-18.

Claim 11	The computer program of claim 10, wherein the rendering of the interpretation of the spoken request is performed at the one or more network servers.

Kupiec discloses "a processor 10 coupled to …an information retrieval (IR) subsystem 40 which accesses documents from corpus 41 using a word index 42" as well as "a phonetic transcriber 50, a hypothesis generator 60, a phonetic index 62, a query constructor 70, and a scoring mechanism 80," which are "typically implemented as software modules." Ex. 1013, at 24:15-21; Ex. 1012, ¶¶627,629. "Processor 10 is a computer processing unit (CPU)" that typically is "part of a mainframe, workstation, or personal computer" but can comprise "multiple processing elements in some embodiments." Ex. 1013, at 5:52-55; Ex. 1012, ¶628. Dr. Negus explains that a POSA would consider an operation performed in a "mainframe computer" to be performed "at the one or more network servers." *Id*. *Kupiec* also provides Source Code Appendix that "includes two files" wherein the "first file includes source code for reading a phonetic index file, for query construction, and for scoring" and the "second file includes source code for hypothesis generation." Ex. 1012, ¶629; Ex. 1018. Therefore, *Kupiec* discloses this limitation. Ex. 1012, ¶631.

To the extent the Board determines that a "mainframe workstation" is not "at the one or more network servers," *Cheyer* discloses this limitation. *Cheyer* states "The interface is connected either by modem or ethernet to a server machine which will manage database access, natural language processing and speech recognition for the application." Ex. 1019, p.5-6; Ex. 1012, ¶634. Therefore, *Cheyer* discloses that the software for "natural language processing and speech recognition," is located at a server machine remote from the user. Ex. 1012, ¶641. A POSA would have been motivated to combine the system of *Kupiec* with the mobile information appliance of *Cheyer* for all the reasons disclosed above. *See supra* §VI.A.1.

Claim 12	The computer program of claim 10, wherein the rendering of the interpretation of the spoken request is performed by the mobile information appliance.

See supra §VI.A.2, Claims 2&3. *Kupiec* discloses software modules, including a phonetic transcriber, that can be implemented on a workstation or a personal computer with a headset microphone input that would normally be located locally with the user. Ex. 1012, ¶652. To the extent *Kupiec* does not explicitly disclose the "mobile information appliance," *Cheyer* discloses "user interface" that "runs on pen-equipped PC's or a Dauphin handheld PDA." Ex. 1019, p.5; Ex. 1012, ¶659. Therefore, *Kupiec* in view of *Cheyer* discloses that the rendering of a spoken request is performed by the mobile information appliance. Ex. 1012, ¶661. A POSA would have been motivated to combine the system of *Kupiec* with the mobile information appliance of *Cheyer* for all the reasons disclosed *supra*. *See supra* §§ VI.A.1, A.2.

Claim 13[a]	The computer program of claim 10, further comprising a code segment that solicits additional input from the user, including user interaction in a modality different than the original request;

See supra §VI.A.2, Element 4[a]. Ex. 1012, ¶699.

Claim 13[b]	a code segment that refines the navigation query, based upon the additional input;

See supra §VI.A.2, Element 4[b]. Ex. 1012, ¶714.

Claim 13[c]	and a code segment that uses the refined navigation query to select a portion of the electronic data source.

See supra §VI.A.2, Element 4[c]. Ex. 1012, ¶732.

Claim 15	The computer program of claim 10, wherein code segments (a)-(d) are executed with respect to multiple users.

See supra §VI.A.2, Claim 6. Ex. 1012, ¶762.

Claim 17	The computer program of claim 10, wherein the mobile information appliance is a portable computing device.

See supra §VI.A.2, Claim 8.

Claim 18	The computer program of claim 17, wherein the portable computing device is a personal digital assistant.

See supra §VI.A.2, Claim 9.

5. Independent Claim 19.

Independent Claim 19 differs from Independent Claim 1 only because it is a system claim rather than a method claim. It is obvious for the same reasons recited as to claim 1.

Claim 19[a]	A system for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, comprising:

See supra §VI.A.1, Element 1[a]. Kupiec and Cheyer both teach systems executing their disclosed functionality. *See* Ex. 1013, at 1:36-45 ("A system and method for automatically transcribing an input question from a form convenient for user input into a form suitable for use by a computer."); Ex. 1019, p.4-5 (". . . the system permits the user to simultaneously combine direct manipulation, gestural drawings, handwritten, typed and spoken natural language."); Ex. 1019, p.5-6 ("The result is a mobile system that provides a synergistic pen/voice interface to remote databases.") Therefore, *Kupiec* in view of *Cheyer* discloses this preamble. Ex. 1012, ¶¶ 811,816,820,821,825.

Claim 19[b]	(a) a mobile information appliance operable to receive a spoken request for desired information from the user, wherein said mobile information appliance comprises a portable remote control device or a set-top box for a television;

See supra §VI.A.1, Element 1[b]; Ex. 1012, ¶¶ 839, 841.

Claim 19[c]	(b) spoken language processing logic, operable to render an interpretation of the spoken request;

See supra §VI.A.1, Element 1[c]. The term "spoken language processing logic" does not appear in the specification, but the term "request processing logic 300" is described as comprising "functional modules including speech recognition engine 310, natural language (NL) parser 320, query construction logic 330, and query refinement logic 340." Ex. 1003, at 4:17-21. *Kupiec* teaches that the transcriber, implemented as a software module, produces a phonetic representation of the spoken request, thus "rendering an interpretation of the spoken request." Ex. 1013, at 24:15-21; Ex. 1012, ¶¶869,871.

Claim 19[d]	(c) query construction logic, operable to construct a navigation query based upon the interpretation;

See supra §VI.A.1, Element 1[d]. Kupiec describes that "The phonetic transcription 250 is provided to hypothesis generator 60 where it is matched using phonetic index 62 to generate a set of hypotheses 260" and further that "Once the set of hypotheses 260 has been generated, it is provided to query constructor 70" such that "Query constructor 70 uses the hypotheses 260 to construct one or more queries 270 that will be sent to IR subsystem 40 for execution." Ex. 1013, at 11:10-13; Ex. 1012, ¶882. Because "query constructor 70" can be implemented as a software module, *Kupiec* also discloses query construction logic, operable to construct a navigation query based upon the interpretation. Ex. 1012, ¶888.

Claim 19[e]	(d) navigation logic, operable to select a portion of the electronic data source using the navigation query, and

See supra §VI.A.1, Element 1[e]. *Kupiec* discloses that the analyzer/evaluator can be implemented as a software module (e.g., logic) executing on a processor in combination with the IR subsystem that can be searched using a relevance feedback modified query to select documents therein. Ex. 1012, ¶908.

Claim 19[f]	(e) electronic communications infrastructure for transmitting the selected portion of the electronic data source from the network server to the mobile information appliance of the user.

See supra §VI.A.1, Element 1[f]. Kupiec discloses retrieving documents from the IR subsystem at a remote site and transmitting them over a communications network (i.e. "electronic communications infrastructure") and displaying the selected documents on a computer screen. Ex. 1012, ¶925. Cheyer discloses a handheld PDA that can be connected to data sources such as the World Wide Web over a modem or ethernet. Ex. 1012, ¶931. Thus, *Kupiec* in view of *Cheyer* discloses this element. Ex. 1012, ¶¶927,933. A POSA would have combined *Kupiec* and *Cheyer* for all of the reasons described herein. *See supra* §VI.A.1, Claim 1.

6. Dependent Claims 20-22, 24, and 26-27.

Claim 20	The system of claim 19, wherein the spoken language processing logic renders the interpretation of the spoken request at the one or more network servers.

See supra §VI.A.1, Element 1[d]. Dr. Negus explains how *Kupiec* discloses the rendering of the interpretation of the spoken request is performed at the one or more network servers when the transcriber is implemented as a software module on a mainframe computer that would normally be located remotely from a user. Ex. 1012, ¶939. To the extent the "mainframe computer" is not located at the one or more network servers, *Cheyer* discloses that the software that renders the interpretation ("natural language processing and speech recognition") is located at a server machine remote from the user connected by modem or ethernet. Ex. 1012, ¶949. Therefore, *Kupiec* in view of *Cheyer* discloses this limitation. Ex. 1012, ¶952. A POSA would have combined *Kupiec* and *Cheyer* for all of the reasons described herein. *See supra* Claim 1.

Claim 21	The system of claim 19, wherein the spoken language processing logic renders the interpretation of the spoken request at the mobile information appliance.

See supra §VI.A.2, Claims 2&3. Ex. 1012, ¶971.

Claim 22[a]	The system of claim 19, further comprising user interaction logic operable to solicit additional input from the user, including user interaction in a modality different than the original request;

See supra §VI.A.2, Element 4[a]. *Kupiec* discloses that the system, implemented as software modules with logic executing on a processor, prompts a user to repeat a question or accepts additional words provided as relevance feedback to direct a search in the form of handwritten or typewritten modalities. Ex. 1012, ¶994. *Cheyer* teaches various software agents with logic that can prompt a user for input via spoken and non-spoken modalities such as handwriting, gestures or direct manipulation by mouse pointer or typing. Ex. 1012, ¶1005.

Claim 22[b]	and query refining logic operable to refine the navigation query based upon the additional input;

See supra §VI.A.2, Element 4[b]. *Kupiec* discloses that the user can provide relevance feedback commands for query reformulation which causes the system implemented by software modules with logic to perform a follow-up search. Ex. 1012, ¶1022.

Claim 22[c]	wherein the navigation logic users the refined navigation query to select a portion of the electronic data source.[2]

See supra §VI.A.2, Element 4[c]. Kupiec discloses that the software modules with logic executing on a processor conduct searches of the IR subsystem and select documents for display based on the user's relevance feedback commands. Ex. 1012, ¶1040.

Claim 24	The system of claim 19, wherein the system operates with respect to multiple users.

See supra §VI.A.2, Claim 6. Ex. 1012, ¶¶ 1058, 1067, 1070.

Claim 26	The system of claim 19, wherein the mobile information appliance is a portable computing device.
Claim 27	The system of claim 26, wherein the portable computing device is a personal digital assistant.

See supra §VI.A.2, Claims 8, 9.

B. Ground 2: The '718 Patent Claims 1-4, 6, 8-9, 10-13, 15, 17-18, 19-22, 24, and 26-27 are obvious over *Kupiec (Ex. 1013)* in view of *Cheyer (Ex. 1019)* and in further view of *Kimura (Ex. 1015)*.

This ground is presented in the alternative to Ground 1 for claims 1-4, 6, 8-9, 10-13, 15, 17-18, 19-22, 24, and 26-27, to the extent the Board concludes that neither *Kupiec* nor *Cheyer* sufficiently discloses "wherein said mobile information

[2] For the purpose of this Petition, Petitioner will interpret the claim as "the navigation logic uses [not users] the refined navigation query. . ."

appliance comprises a remote control device or a set-top box for a television," or "wherein the step of rendering the interpretation of the spoken request is performed by the mobile information appliance."

1. Independent Claim 1.

Kupiec in view of *Cheyer* discloses each of the limitations of independent claim 1. *See supra* §VI.A.1. The limitation "wherein said mobile information appliance comprises a portable remote control device or a set-top box for a television," would have been obvious in view of *Kupiec*, *Cheyer* and *Kimura*.

Kimura discloses a "remote control system for remotely controlling various electronic devices … such as AV (audio visual) devices by way of voice commands." Ex. 1015, at 1:8-12; Ex. 1012, ¶258. *Kimura* discloses that the remote control system "comprises a transmitter 101 for transmitting a remote control signal from a position remote from a controlled device 103 such as an AV device, and a receiver 102 for …sending the decoded information to the controlled device." Ex. 1015 at 3:10-15; Ex. 1012, ¶259. The transmitter 101 has a "microphone M for converting a voice command into an electric signal" that "is applied to a speech recognition circuit 15 in the form of a speech recognition LSI circuit or the like which includes a microprocessor" and "produces command data corresponding to the recognized contents." Ex. 1015 at 3:27-36; Ex. 1012, ¶260. Thus, *Kimura* discloses "a portable remote control device" that is "for a television" as the portable transmitter with a CPU that provides a remote control signal to a television receiver and that is part of a system for "receiving a spoken request." Ex. 1012, ¶265.

Motivation to Combine *Kupiec*, *Cheyer*, and Kimura

A POSA would have implemented the system of searching a remote database using spoken input disclosed by *Kupiec* in view of the "mobile information appliance" disclosed by *Cheyer* with the voice-controlled remote control disclosed by *Kimura* for several reasons. First, *Kimura* addresses a problem related to the problems addressed by *Kupiec* and *Cheyer*, i.e. using spoken language input that upon transcription is prone to errors for the control of AV devices such as television receivers. Ex. 1012, ¶267. Next, *Kimura* also describes a system with similarities regarding the use of portable handheld devices that use voice input and speech recognition. Ex. 1012, ¶268. Third, *Kupiec*, *Cheyer* and *Kimura* each rely upon speech transcription techniques that are susceptible to transcription errors for which convenient user input via a portable interface device is likely to be needed. Ex. 1012, ¶269. Neither *Kupiec* nor *Cheyer* teaches away from or excludes the use of a mobile information appliance for a speech recognition system that comprises a "portable remote control device" specifically "for a television" by their disclosures of a personal digital assistant. Ex. 1012, ¶271.

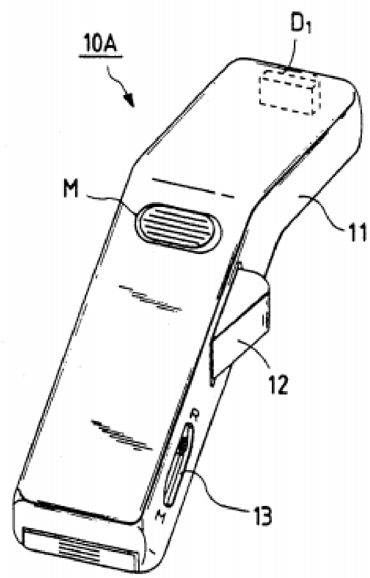
Kimura teaches that a handheld "voice-operated remote control system" can be used with a CPU and speech recognition to control AV devices such as television receivers, so it would have been obvious to a POSA to apply the techniques for speech and non-speech user interaction to obtain user-desired content from a source as taught in *Kupiec* and *Cheyer* to enable user-desired programming from a source to be obtained and displayed on a television as taught in *Kimura*. Ex. 1012, ¶268. Additionally, *Kimura* already discloses the combination of spoken input via such a portable voice input device, thereby further illustrating the high likelihood of success for applying the approach put forth in *Kimura* to the system of *Kupiec* in view of *Cheyer*. *Id*.

2. Dependent Claims 2 & 3.

It would have been obvious to a POSA to utilize the system for searching a remote database by spoken input disclosed by *Kupiec* on a mobile device as disclosed by *Cheyer* to perform the step of rendering the interpretation of the spoken request. *See supra* §VI.A.2, claims 2 and 3. To the extent *Kupiec* in view of *Cheyer* does not disclose the limitation "wherein the step of rendering the interpretation of the spoken request is performed by the mobile information appliance," *Kimura* explicitly discloses this limitation.

As discussed *supra*, *Kimura* discloses the remote control system in a "unitary casing" that "allows the operator to carry the transmitter freely around." Ex. 1015 at 4:5-13. This is depicted in Fig. 4:

FIG. 4



This permits "transmitting a remote control signal from a position remote from a controlled device 103 such as an AV device." Ex. 1015 at 3:10-15; Ex. 1012, ¶353. The transmitter "produces command data corresponding to the recognized contents" of the user's speech. Ex. 1015 at 3:27-36; Ex. 1012, ¶355. *Kimura* describes in reference to FIG. 7 that "the speech recognition circuit 15A comprises an analog processor 21 for processing an analog voice command signal which is received through the microphone M and outputting the processed analog voice command signal as a time-division digital data 20, a speech recognition processor 22 for recognizing the voice command based on the time-division digital data 20 from the analog processor 21, a memory 23A for storing standard pattern data for speech recognition, and an interface 24 for transmitting signals to and receiving signals from the controller 16A." Ex. 1012, ¶357. Thus, *Kimura* discloses a portable remote control containing a speech recognition circuit capable of recognizing the contents of a spoken request. Ex. 1012, ¶359.

A POSA would be motivated to combine *Kimura* with the disclosures of *Kupiec* and *Cheyer* for all of the reasons discussed above. *See supra* §VI.B.1.

3. Dependent Claims 4, 6, 8-9

As shown above, *Kupiec* in view of *Cheyer* discloses the limitations of claims 4, 6, 8-9. *See supra* §VI.A.2, at Claims 4,6,8,9. As shown above, *Kupiec* in view of *Cheyer* in further view of *Kimura* renders each of the claim limitations of Claim 1 obvious. *See supra* §VI.B.1. Because claims 4, 6, and 8-9 depend from Claim 1, they are also rendered obvious under *Kupiec*, *Cheyer*, and *Kimura* for the same reasons as shown above in § VI.A.2 as to those claims.

4. Independent Claim 10.

See supra §VI.A.3. The combination of *Kupiec*, *Cheyer*, and *Kimura* discloses each of the limitations of claim 10 for the same reasons as disclosed for claim 1 above. *See supra* §VI.B.1.

5. Dependent Claim 12.

Kupiec and *Cheyer* disclose the limitations of claim 12. *See supra* §VI.A.4, at Claim 12. To the extent *Kupiec* and *Cheyer* do not disclose this limitation, the combination of *Kupiec*, *Cheyer*, and *Kimura* discloses each of the limitations of claim 12 for the same reasons as disclosed for claim 2 above. *See supra* §VI.B.2.

6. Dependent Claims 11, 13, 15, and 17-18.

Kupiec and *Cheyer* disclose these limitations. *See supra* §VI.A.4, at Claims 11, 13, 15, 17, 18. Furthermore, because claims 11, 13, 15, and 17-18 depend from Claim 10, they are also rendered obvious under *Kupiec*, *Cheyer*, and *Kimura*. *See supra* §VI.B.4.

7. Independent Claim 19.

See supra §VI.A.5. The combination of *Kupiec*, *Cheyer*, and *Kimura* discloses each of the limitations of claim 19 for the same reasons as claim 1 above. *See supra* §VI.B.1.

8. Dependent Claim 21.

See supra §VI.A.6, at Claim 21. The combination of *Kupiec*, *Cheyer*, and *Kimura* discloses each of the limitations of claim 21 for the same reasons as disclosed for claim 2 above. *See supra* §VI.B.2.

9. Dependent Claims 20, 22, 24, and 26-27.

See supra §VI.A.6, at claims 20, 22, 24, 26, 27. Furthermore, because claims 20, 22, 24, and 26-27 depend from Claim 19, they are also rendered obvious under *Kupiec*, *Cheyer*, and *Kimura* for the same reasons as Claim 19. *See supra* §VI.B.7.

C. *Ground 3: Claims 6, 15, and 24 are obvious over Kupiec in view of Cheyer in further view of Freeman.*

This ground is presented in the alternative to Ground 1 for claims 6, 15, and 24, to the extent the Board concludes that *Kupiec*, *Cheyer*, and *Kimura* do not disclose that the method, computer program, and system can be operated with respect to "multiple users."

1. Dependent Claim 6

Independent claim 1, from which claim 6 depends, is disclosed as above. *See supra* §VI.A.1. Section §VI.A.2 discloses Claim 6 by *Kupiec* in view of *Cheyer*. To the extent that the combination of *Kupiec* and *Cheyer* is found not to disclose this limitation, it is taught by *Freeman*. *Freeman* teaches a "system for managing personal electronic information which uses a time-ordered stream as a storage model." Ex. 1014, at 3:62-4:2; Ex. 1012, ¶446. The system may perform many tasks, including "search and retrieval tasks." *Id*. Users may "access their personal document streams from any available platform such as a ... personal digital assistant (PDA), or a set-top box via cable." Ex. 1014, at 2:56-61; Ex. 1012, ¶446. *Freeman* explains "[a] stream according to the present invention can be controlled by a voice-interface as well as a computer and thereby be accessed via a conventional phone." Ex. 1014, at 11:38-40; Ex. 1012, ¶448. This voice control allows: "(1) the stream to be searched and manipulated; (2) new objects to be installed; (3) objects to be transferred." *Id*.

Freeman teaches "[a] stream is a data structure that can be examined and to the extent possible manipulated by many processes simultaneously." Ex. 1014, at 13:50-64; Ex. 1012, ¶449. Simultaneous access must be allowed "because: (1) a user creates many software agents which may need to examine the stream concurrently; and (2) a user may have granted other users limited access to the user's stream, and the user will want access to this stream even while the other users access the stream." *Id*. For example, *Freeman* discloses that "[o]ne embodiment of the present invention is configured such that each server may support three to four simultaneous users." Ex. 1014, at 13:65-67; Ex. 1012, ¶450. Accordingly, *Freeman* discloses that the method can be operated with respect to multiple users at least because it discloses a voice-controlled system capable of performing information searches that operates with multiple simultaneous users, each of which accesses the system on their own client device such as a personal computer, PDA, or set-top box. Ex. 1012, ¶451.

Motivation to Combine *Freeman* with *Kupiec* and *Cheyer*

A POSA would have been motivated combine *Kupiec* and *Cheyer* with *Freeman* to allow for access from multiple users as taught by *Freeman* for many reasons. Ex. 1012, ¶452. A POSA at the time of the invention would have been motivated use Freeman's approach to simultaneous access to information in the combination of *Kupiec* and *Cheyer,* because *Kupiec* and *Cheyer* are directed to solving the problem of building a system for retrieval of information from remote electronic sources based upon an error and/or ambiguity prone transcription of a spoken language inquiry (*See, e.g.*, Ex. 1013, at 1:36-45, 1:61-67; Ex. 1019, p.2, 10; Ex. 1012, ¶453) and *Freeman* is directed to a related problem of using spoken language input on client devices to retrieve data from Internet-based client/server systems. *See, e.g.*, Ex. 1014, at 3:62-4:2; Ex. 1012, ¶453. Both *Kupiec* and *Cheyer* contemplate retrieving information from remote sources using client devices, while *Freeman* explicitly teaches doing so simultaneously in relation to multiple users. Ex. 1012, ¶455. In fact, *Freeman* specifically explains the advantages of simultaneous access in scenarios where the system has multiple software agents or users that would benefit from this ability. Ex. 1014, at 13:59-64; Ex. 1012, ¶455. Thus, a POSA would be motivated by *Freeman* to utilize *Kupiec* and *Cheyer*'s system for accessing information from a remote source with multiple users. Similarly, a POSA would be motivated to implement *Freeman*'s system for multi-user access to data using the multi-modal user input and feedback techniques of *Kupiec* and *Cheyer,* as those references extol the benefits of such techniques to user interactions with rich data sets. Ex. 1012, ¶455.

Neither *Kupiec* nor *Cheyer* teach away from or exclude the concept of multiple users, and a POSA would have had a reasonable expectation of success in doing so. Ex. 1012, ¶456.

2. Dependent Claim 15

Independent claim 10, from which claim 15 depends, is disclosed as above. *See supra* §VI.A.3. Section §VI.A.4 discloses Claim 15 by *Kupiec* in view of *Cheyer*. To the extent that the combination of *Kupiec* and *Cheyer* is found not to disclose this limitation, it is taught by *Freeman*. *See supra* §VI.C.1. As *Kupiec*, *Cheyer*, and *Freeman* are all directed to software programming for a computer, *Kupiec* in view of *Cheyer* in further view of *Freeman* discloses this limitation. Ex. 1012, ¶774. *See supra* §VI.C.1 (showing the motivation to combine the references).

3. Dependent Claim 24

Independent claim 19, from which claim 24 depends, is disclosed as above. *See supra* §VI.A.5. Section §VI.A.6 discloses Claim 24 by *Kupiec* in view of *Cheyer*. To the extent that the combination of *Kupiec* and *Cheyer* is found not to disclose this limitation, it is taught by *Freeman*. *See supra* §VI.C.1. As *Kupiec*, *Cheyer*, and *Freeman* are all directed to a system implemented by software for a computer, *Kupiec* in view of *Cheyer* in further view of *Freeman* discloses this limitation. Ex. 1012, ¶1082. *See supra* §VI.C.1 (showing the motivation to combine the references).

VII. CONCLUSION

Petitioner respectfully requests that *inter parties* review of the '718 Patent be instituted and that the challenged claims be cancelled as unpatentable under 35 U.S.C. § 318(b).

Respectfully submitted,

BAKER BOTTS L.L.P.

Date: December 20, 2017

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CERTIFICATE OF SERVICE

In accordance with 37 C.F.R. §§ 42.6(e) and 42.105, the undersigned certifies that on the 20th day of December, 2017, a complete and entire copy of the **PETITION FOR *INTER PARTES* REVIEW OF CLAIMS 1-4, 6, 8-9, 10-13, 15, 17-18, 19-22, 24, AND 26-27 OF U.S. PATENT NO. 6,757,718 UNDER 35 U.S.C. §§ 311-319 AND 37 C.F.R. §§ 42.100 *ET SEQ.*** ("petition") including exhibits and testimony relied upon were served on the patent owner at the correspondence address of record for the subject patent,

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via FedEx overnight, to counsel for patent owner in the Lawsuit,

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CERTIFICATION UNDER 37 C.F.R. § 42.24(d)

Pursuant to 37 C.F.R. § 42.24(d), the undersigned hereby certifies that the word count under § 42.24(a)(1) for the foregoing Petition for *Inter Partes* Review totals 13,093 words, within the 14,000 word limit allowed under § 42.24(a)(1)(i).

Date: December 20, 2017

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(12) **United States Patent**
Halverson et al.

(10) **Patent No.: US 6,742,021 B1**
(45) **Date of Patent: May 25, 2004**

(54) **NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN INPUT WITH MULTIMODAL ERROR FEEDBACK**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/524,095**

(22) Filed: **Mar. 13, 2000**

Related U.S. Application Data

(63) Continuation-in-part of application No. 09/225,198, filed on Jan. 5, 1999.

(60) Provisional application No. 60/124,718, filed on Mar. 17, 1999, provisional application No. 60/124,720, filed on Mar. 17, 1999, and provisional application No. 60/124,719, filed on Mar. 17, 1999.

(51) **Int. Cl.**[7] **G06F 15/16**

(52) **U.S. Cl.** **709/218**; 707/5; 707/4; 707/102

(58) **Field of Search** 709/218; 707/5, 707/4, 102; 704/257, 231

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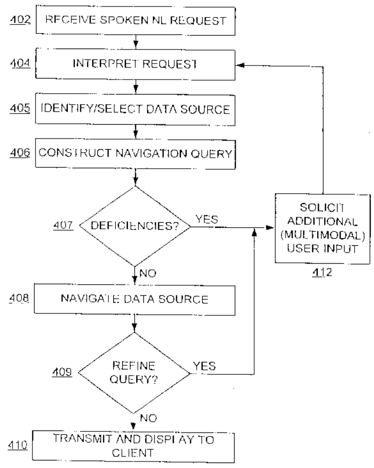
(57) **ABSTRACT**

A system, method, and article of manufacture are provided for navigating an electronic data source by means of spoken language. When a spoken input request is received from a user, it is interpreted. Additional input is solicited from the user in a modality different than the original request and used to refine the navigation query. The resulting interpretation of the request is thereupon used to automatically construct an operational navigation query to retrieve the desired information from one or more electronic network data sources.

132 Claims, 7 Drawing Sheets



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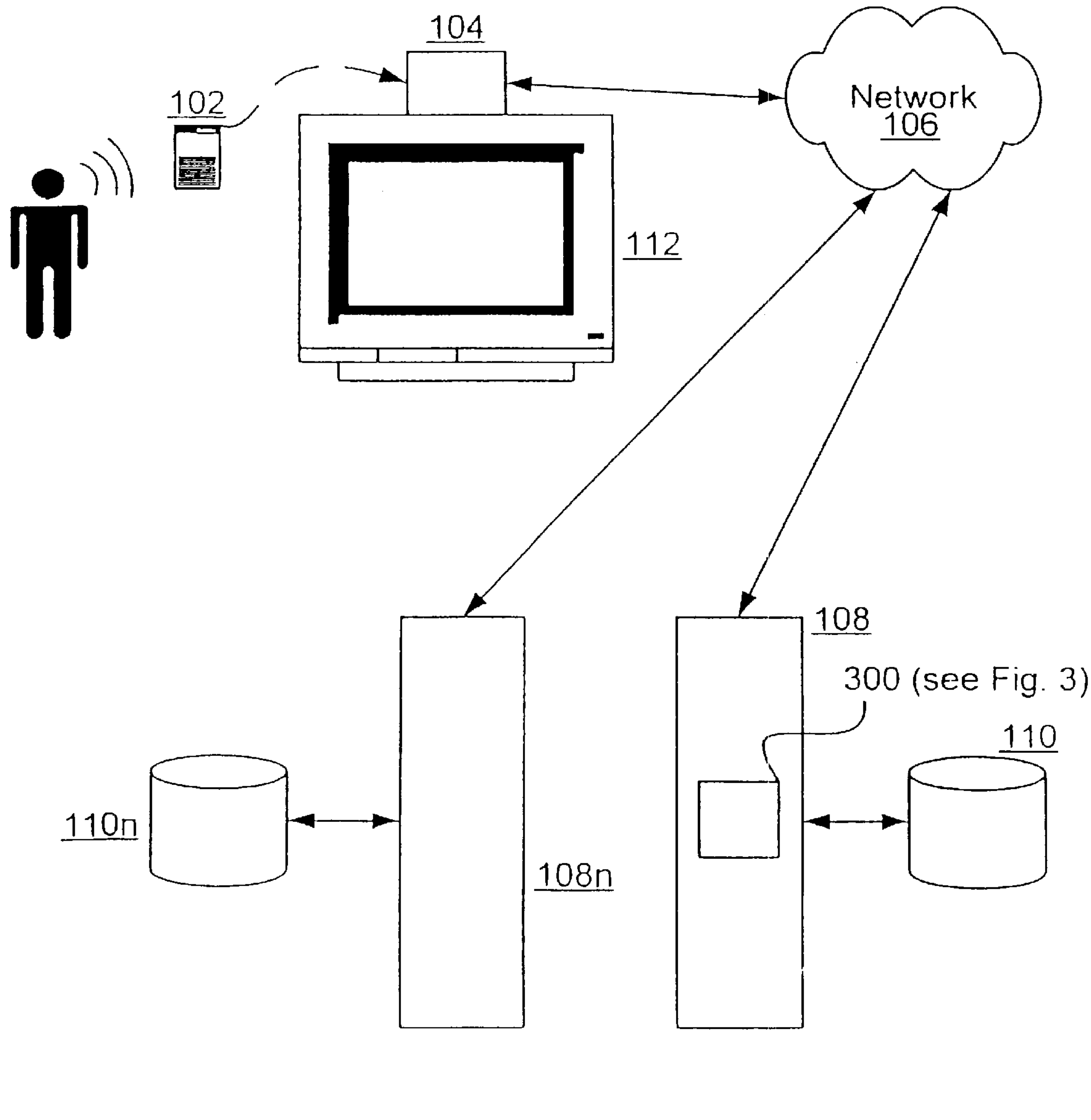

Fig. 1a

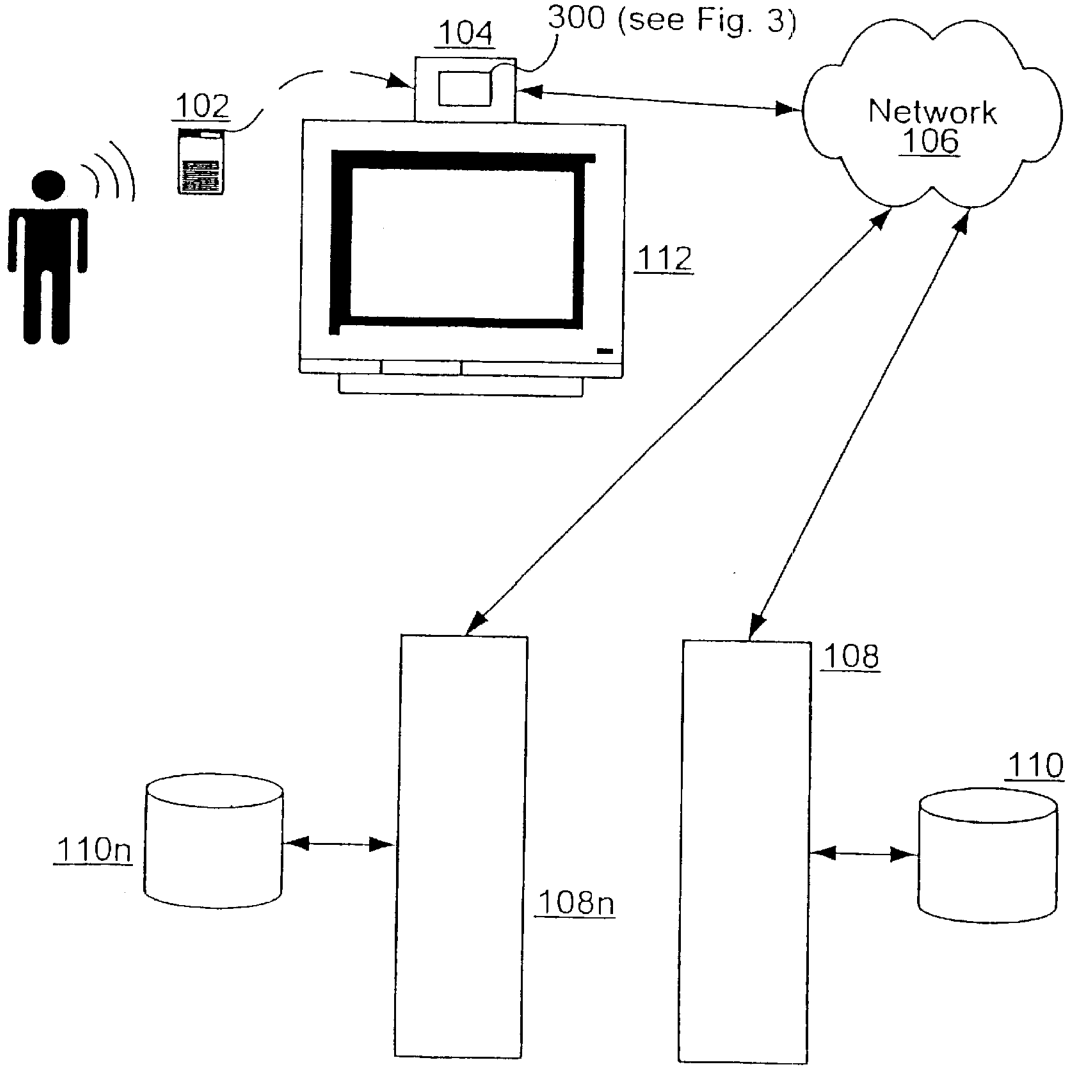

Fig. 1b

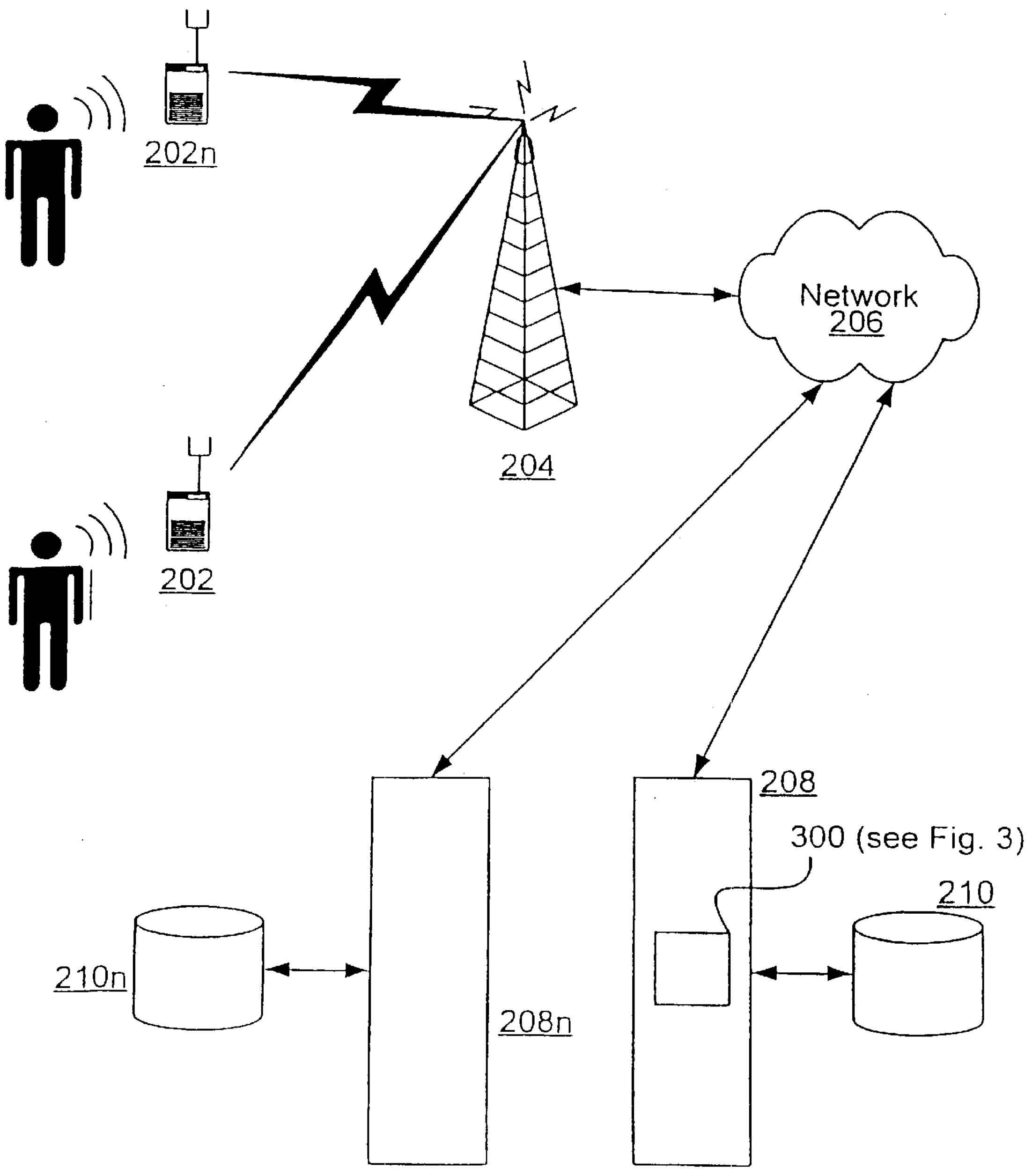

Fig. 2

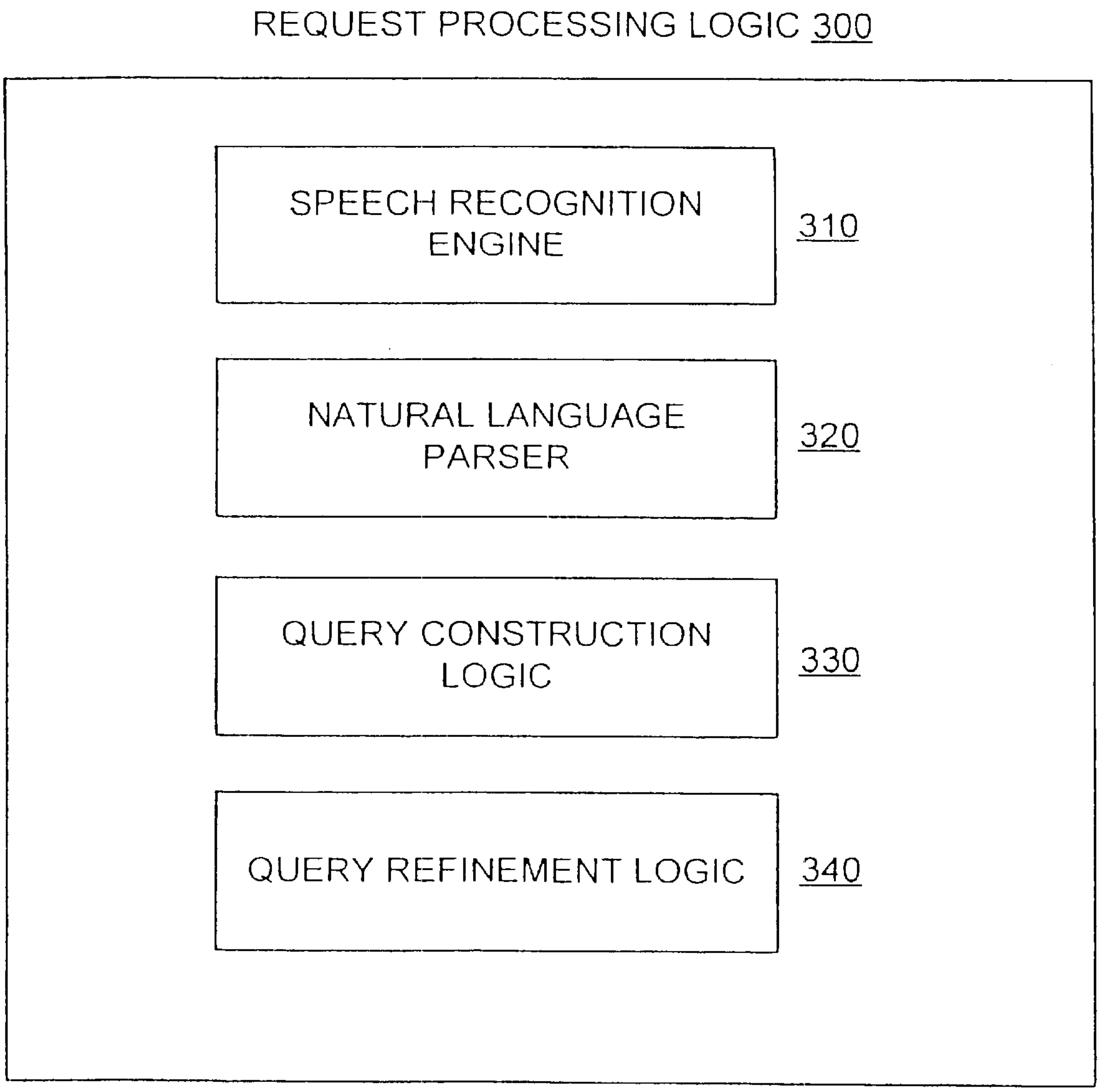
REQUEST PROCESSING LOGIC 300
SPEECH RECOGNITION ENGINE
310
NATURAL LANGUAGE PARSER
320
QUERY CONSTRUCTION LOGIC
330
QUERY REFINEMENT LOGIC
340

Fig. 3

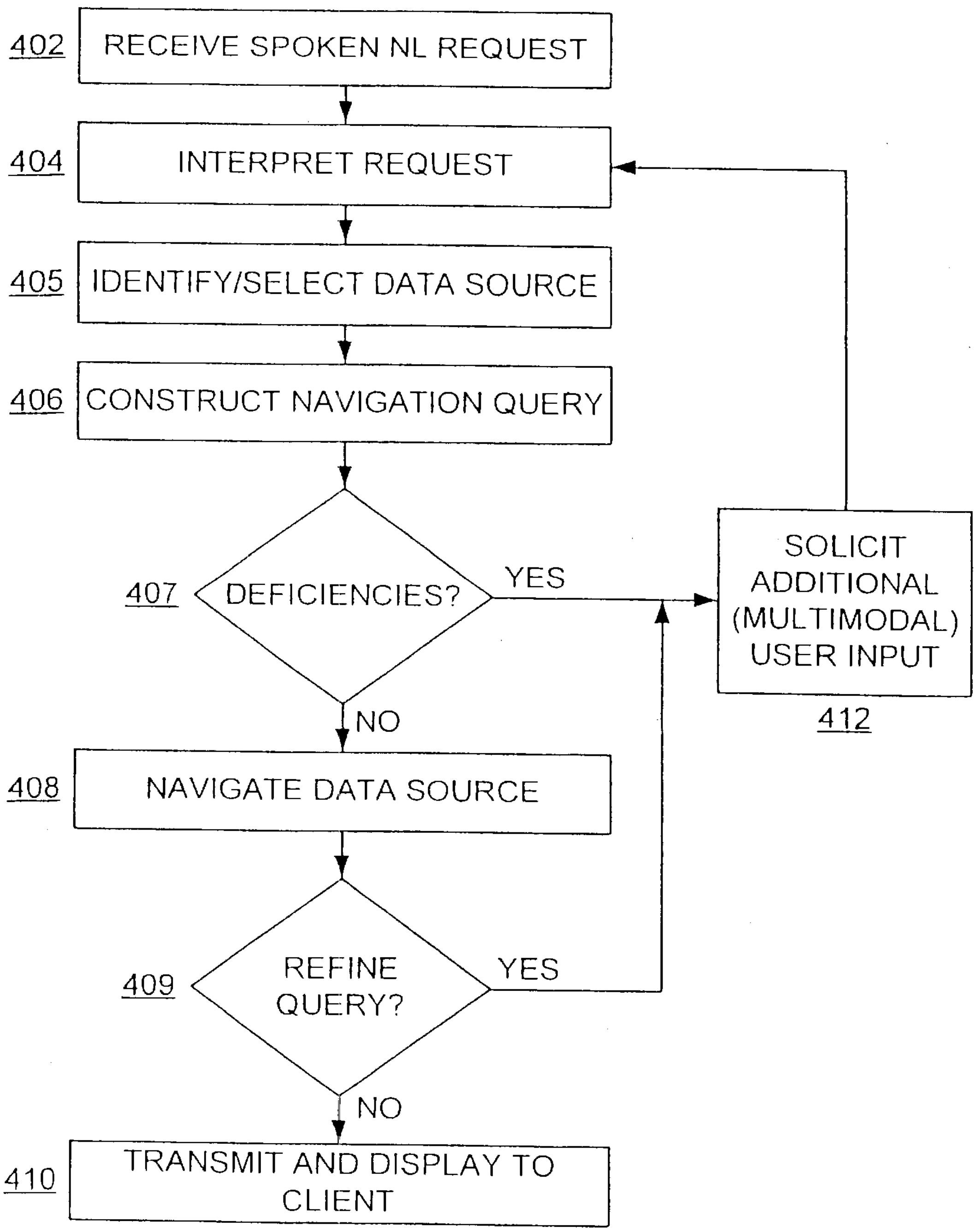
402
RECEIVE SPOKEN NL REQUEST
404
INTERPRET REQUEST
405
IDENTIFY/SELECT DATA SOURCE
406
CONSTRUCT NAVIGATION QUERY
407
DEFICIENCIES?
YES
NO
SOLICIT ADDITIONAL (MULTIMODAL) USER INPUT
412
408
NAVIGATE DATA SOURCE
409
REFINE QUERY?
YES
NO
410
TRANSMIT AND DISPLAY TO CLIENT

Fig. 4

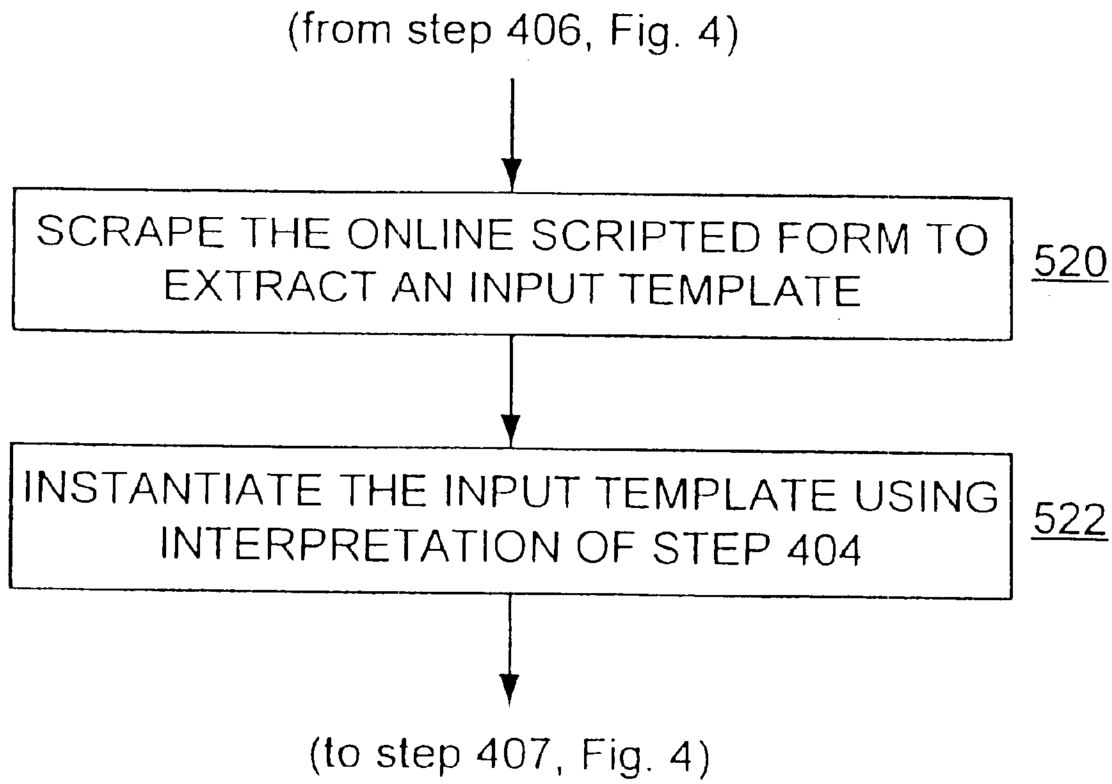
(from step 406, Fig. 4)
SCRAPE THE ONLINE SCRIPTED FORM TO EXTRACT AN INPUT TEMPLATE
520
INSTANTIATE THE INPUT TEMPLATE USING INTERPRETATION OF STEP 404
522
(to step 407, Fig. 4)

Fig. 5

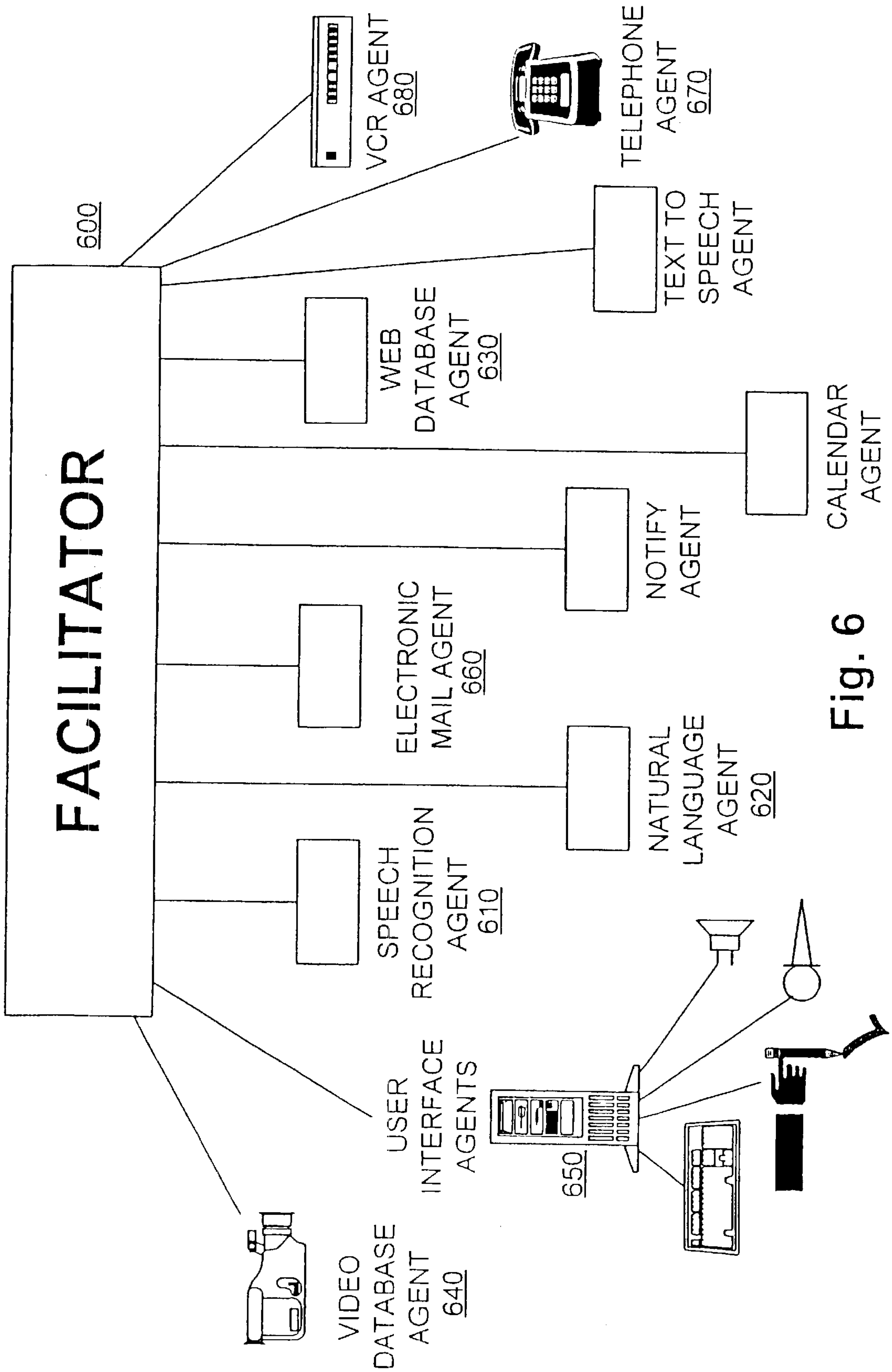
600
FACILITATOR
VCR AGENT 680
TELEPHONE AGENT 670
TEXT TO SPEECH AGENT
WEB DATABASE AGENT 630
CALENDAR AGENT
NOTIFY AGENT
ELECTRONIC MAIL AGENT 660
NATURAL LANGUAGE AGENT 620
SPEECH RECOGNITION AGENT 610
USER INTERFACE AGENTS
650
VIDEO DATABASE AGENT 640

Fig. 6

NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN INPUT WITH MULTIMODAL ERROR FEEDBACK

This is a Continuation In Part of co-pending U.S. patent application Ser. No. 09/225,198, filed Jan. 5, 1999, Provisional U.S. patent application Ser. No. 60/124,718, filed Mar. 17, 1999, Provisional U.S. patent application Ser. No. 60/124,720, filed Mar. 17, 1999, and Provisional U.S. patent application Ser. No. 60/124,719, filed Mar. 17, 1999, from which applications priority is claimed and these application are incorporated herein by reference.

BACKGROUND OF THE INVENTION

The present invention relates generally to the navigation of electronic data by means of spoken natural language requests, and to feedback mechanisms and methods for resolving the errors and ambiguities that may be associated with such requests.

As global electronic connectivity continues to grow, and the universe of electronic data potentially available to users continues to expand, there is a growing need for information navigation technology that allows relatively naïve users to navigate and access desired data by means of natural language input. In many of the most important markets—including the home entertainment arena, as well as mobile computing—spoken natural language input is highly desirable, if not ideal. As just one example, the proliferation of high-bandwidth communications infrastructure for the home entertainment market (cable, satellite, broadband) enables delivery of movies-on-demand and other interactive multimedia content to the consumer's home television set. For users to take full advantage of this content stream ultimately requires interactive navigation of content databases in a manner that is too complex for user-friendly selection by means of a traditional remote-control clicker. Allowing spoken natural language requests as the input modality for rapidly searching and accessing desired content is an important objective for a successful consumer entertainment product in a context offering a dizzying range of database content choices. As further examples, this same need to drive navigation of (and transaction with) relatively complex data warehouses using spoken natural language requests applies equally to surfing the Internet/Web or other networks for general information, multimedia content, or e-commerce transactions.

In general, the existing navigational systems for browsing electronic databases and data warehouses (search engines, menus, etc.), have been designed without navigation via spoken natural language as a specific goal. So today's world is full of existing electronic data navigation systems that do not assume browsing via natural spoken commands, but rather assume text and mouse-click inputs (or in the case of TV remote controls, even less). Simply recognizing voice commands within an extremely limited vocabulary and grammar—the spoken equivalent of button/click input (e.g., speaking "channel 5" selects TV channel 5)—is really not sufficient by itself to satisfy the objectives described above. In order to deliver a true "win" for users, the voice-driven front-end must accept spoken natural language input in a manner that is intuitive to users. For example, the front-end should not require learning a highly specialized command language or format. More fundamentally, the front-end must allow users to speak directly in terms of what the user ultimately wants —e.g., "I'd like to see a Western film directed by Clint Eastwood"—as opposed to speaking in terms of arbitrary navigation structures (e.g., hierarchical layers of menus, commands, etc.) that are essentially artifacts reflecting constraints of the pre-existing text/click navigation system. At the same time, the front-end must recognize and accommodate the reality that a stream of naive spoken natural language input will, over time, typically present a variety of errors and/or ambiguities: e.g., garbled/unrecognized words (did the user say "Eastwood" or "Easter"?) and under-constrained requests ("Show me the Clint Eastwood movie"). An approach is needed for handling and resolving such errors and ambiguities in a rapid, user-friendly, non-frustrating manner.

What is needed is a methodology and apparatus for rapidly constructing a voice-driven front-end atop an existing, non-voice data navigation system, whereby users can interact by means of intuitive natural language input not strictly conforming to the step-by-step browsing architecture of the existing navigation system, and wherein any errors or ambiguities in user input are rapidly and conveniently resolved. The solution to this need should be compatible with the constraints of a multi-user, distributed environment such as the Internet/Web or a proprietary high-bandwidth content delivery network; a solution contemplating one-at-a-time user interactions at a single location is insufficient, for example.

SUMMARY OF THE INVENTION

The present invention addresses the above needs by providing a system, method, and article of manufacture for navigating network-based electronic data sources in response to spoken input requests. When a spoken input request is received from a user, it is interpreted, such as by using a speech recognition engine to extract speech data from acoustic voice signals, and using a language parser to linguistically parse the speech data. The interpretation of the spoken request can be performed on a computing device locally with the user or remotely from the user. The resulting interpretation of the request is thereupon used to automatically construct an operational navigation query to retrieve the desired information from one or more electronic network data sources, which is then transmitted to a client device of the user. If the network data source is a database, the navigation query is constructed in the format of a database query language.

Typically, errors or ambiguities emerge in the interpretation of the spoken request, such that the system cannot instantiate a complete, valid navigational template. This is to be expected occasionally, and one preferred aspect of the invention is the ability to handle such errors and ambiguities in relatively graceful and user-friendly manner. Instead of simply rejecting such input and defaulting to traditional input modes or simply asking the user to try again, a preferred embodiment of the present invention seeks to converge rapidly toward instantiation of a valid navigational template by soliciting additional clarification from the user as necessary, either before or after a navigation of the data source, via multimodal input, i.e., by means of menu selection or other input modalities including and in addition to spoken input. This clarifying, multi-modal dialogue takes advantage of whatever partial navigational information has been gleaned from the initial interpretation of the user's spoken request. This clarification process continues until the system converges toward an adequately instantiated navigational template, which is in turn used to navigate the network-based data and retrieve the user's desired information. The retrieved information is transmitted across the network and presented to the user on a suitable client display device.

In a further aspect of the present invention, the construction of the navigation query includes extracting an input template for an online scripted interface to the data source and using the input template to construct the navigation query. The extraction of the input template can include dynamically scraping the online scripted interface.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention, together with further advantages thereof, may best be understood by reference to the following description taken in conjunction with the accompanying drawings in which:

FIG. **1***a* illustrates a system providing a spoken natural language interface for network-based information navigation, in accordance with an embodiment of the present invention with server-side processing of requests;

FIG. **1***b* illustrates another system providing a spoken natural language interface for network-based information navigation, in accordance with an embodiment of the present invention with client-side processing of requests;

FIG. **2** illustrates a system providing a spoken natural language interface for network-based information navigation, in accordance with an embodiment of the present invention for a mobile computing scenario;

FIG. **3** illustrates the functional logic components of a request processing module in accordance with an embodiment of the present invention;

FIG. **4** illustrates a process utilizing spoken natural language for navigating an electronic database in accordance with one embodiment of the present invention;

FIG. **5** illustrates a process for constructing a navigational query for accessing an online data source via an interactive, scripted (e.g., CGI) form; and

FIG. **6** illustrates an embodiment of the present invention utilizing a community of distributed, collaborating electronic agents.

DETAILED DESCRIPTION OF THE INVENTION

1. System Architecture

a. Server-End Processing of Spoken Input

FIG. **1***a* is an illustration of a data navigation system driven by spoken natural language input, in accordance with one embodiment of the present invention. As shown, a user's voice input data is captured by a voice input device **102**, such as a microphone. Preferably voice input device **102** includes a button or the like that can be pressed or held-down to activate a listening mode, so that the system need not continually pay attention to, or be confused by, irrelevant background noise. In one preferred embodiment well-suited for the home entertainment setting, voice input device **102** is a portable remote control device with an integrated microphone, and the voice data is transmitted from device **102** preferably via infrared (or other wireless) link to communications box **104** (e.g., a set-top box or a similar communications device that is capable of retransmitting the raw voice data and/or processing the voice data) local to the user's environment and coupled to communications network **106**. The voice data is then transmitted across network **106** to a remote server or servers **108**. The voice data may preferably be transmitted in compressed digitized form, or alternatively—particularly where bandwidth constraints are significant—in analog format (e.g., via frequency modulated transmission), in the latter case being digitized upon arrival at remote server **108**.

At remote server **108**, the voice data is processed by request processing logic **300** in order to understand the user's request and construct an appropriate query or request for navigation of remote data source **110**, in accordance with the interpretation process exemplified in FIG. **4** and FIG. **5** and discussed in greater detail below. For purposes of executing this process, request processing logic **300** comprises functional modules including speech recognition engine **310**, natural language (NL) parser **320**, query construction logic **330**, and query refinement logic **340**, as shown in FIG. **3**. Data source **110** may comprise database(s), Internet/web site(s), or other electronic information repositories, and preferably resides on a central server or servers—which may or may not be the same as server **108**, depending on the storage and bandwidth needs of the application and the resources available to the practitioner. Data source **110** may include multimedia content, such as movies or other digital video and audio content, other various forms of entertainment data, or other electronic information. The contents of data source **110** are navigated—i.e., the contents are accessed and searched, for retrieval of the particular information desired by the user—using the processes of FIGS. **4** and **5** as described in greater detail below.

Once the desired information has been retrieved from data source **110**, it is electronically transmitted via network **106** to the user for viewing on client display device **112**. In a preferred embodiment well-suited for the home entertainment setting, display device **112** is a television monitor or similar audiovisual entertainment device, typically in stationary position for comfortable viewing by users. In addition, in such preferred embodiment, display device **112** is coupled to or integrated with a communications box (which is preferably the same as communications box **104**, but may also be a separate unit) for receiving and decoding/formatting the desired electronic information that is received across communications network **106**.

Network **106** is a two-way electronic communications network and may be embodied in electronic communication infrastructure including coaxial (cable television) lines, DSL, fiber-optic cable, traditional copper wire (twisted pair), or any other type of hardwired connection. Network **106** may also include a wireless connection such as a satellite-based connection, cellular connection, or other type of wireless connection. Network **106** may be part of the Internet and may support TCP/IP communications, or may be embodied in a proprietary network, or in any other electronic communications network infrastructure, whether packet-switched or connection-oriented. A design consideration is that network **106** preferably provide suitable bandwidth depending upon the nature of the content anticipated for the desired application.

b. Client-End Processing of Spoken Input

FIG. **1***b* is an illustration of a data navigation system driven by spoken natural language input, in accordance with a second embodiment of the present invention. Again, a user's voice input data is captured by a voice input device **102**, such as a microphone. In the embodiment shown in FIG. **1***b*, the voice data is transmitted from device **202** to requests processing logic **300**, hosted on a local speech processor, for processing and interpretation. In the preferred embodiment illustrated in FIG. **1***b*, the local speech processor is conveniently integrated as part of communications box **104**, although implementation in a physically separate (but communicatively coupled) unit is also possible as will be readily apparent to those of skill in the art. The voice data is processed by the components of request processing logic

300 in order to understand the user's request and construct an appropriate query or request for navigation of remote data source **110**, in accordance with the interpretation process exemplified in FIGS. **4** and **5** as discussed in greater detail below.

The resulting navigational query is then transmitted electronically across network **106** to data source **110**, which preferably resides on a central server or servers **108**. As in FIG. **1***a*, data source **110** may comprise database(s), Internet/web site(s), or other electronic information repositories, and preferably may include multimedia content, such as movies or other digital video and audio content, other various forms of entertainment data, or other electronic information. The contents of data source **110** are then navigated—i.e., the contents are accessed and searched, for retrieval of the particular information desired by the user—preferably using the process of FIGS. **4** and **5** as described in greater detail below. Once the desired information has been retrieved from data source **110**, it is electronically transmitted via network **106** to the user for viewing on client display device **112**.

In one embodiment in accordance with FIG. **1***b* and well-suited for the home entertainment setting, voice input device **102** is a portable remote control device with an integrated microphone, and the voice data is transmitted from device **102** preferably via infrared (or other wireless) link to the local speech processor. The local speech processor is coupled to communications network **106**, and also preferably to client display device **112** (especially for purposes of query refinement transmissions, as discussed below in connection with FIG. **4**, step **412**), and preferably may be integrated within or coupled to communications box **104**. In addition, especially for purposes of a home entertainment application, display device **112** is preferably a television monitor or similar audiovisual entertainment device, typically in stationary position for comfortable viewing by users. In addition, in such preferred embodiment, display device **112** is coupled to a communications box (which is preferably the same as communications box **104**, but may also be a physically separate unit) for receiving and decoding/formatting the desired electronic information that is received across communications network **106**.

Design considerations favoring server-side processing and interpretation of spoken input requests, as exemplified in FIG. **1***a*, include minimizing the need to distribute costly computational hardware and software to all client users in order to perform speech and language processing. Design considerations favoring client-side processing, as exemplified in FIG. **1***b*, include minimizing the quantity of data sent upstream across the network from each client, as the speech recognition is performed before transmission across the network and only the query data and/or request needs to be sent, thus reducing the upstream bandwidth requirements.

c. Mobile Client Embodiment

A mobile computing embodiment of the present invention may be implemented by practitioners as a variation on the embodiments of either FIG. **1***a* or FIG. **1***b*. For example, as depicted in FIG. **2**, a mobile variation in accordance with the server-side processing architecture illustrated in FIG. **1** a may be implemented by replacing voice input device **102**, communications box **104**, and client display device **112**, with an integrated, mobile, information appliance **202** such as a cellular telephone or wireless personal digital assistant (wireless PDA). Mobile information appliance **202** essentially performs the functions of the replaced components. Thus, mobile information appliance **202** receives spoken natural language input requests from the user in the form of voice data, and transmits that data (preferably via wireless data receiving station **204**) across communications network **206** for server-side interpretation of the request, in similar fashion as described above in connection with FIG. **1**. Navigation of data source **210** and retrieval of desired information likewise proceeds in an analogous manner as described above. Display information transmitted electronically back to the user across network **206** is displayed for the user on the display of information appliance **202**, and audio information is output through the appliance's speakers.

Practitioners will further appreciate, in light of the above teachings, that if mobile information appliance **202** is equipped with sufficient computational processing power, then a mobile variation of the client-side architecture exemplified in FIG. **2** may similarly be implemented. In that case, the modules corresponding to request processing logic **300** would be embodied locally in the computational resources of mobile information appliance **202**, and the logical flow of data would otherwise follow in a manner analogous to that previously described in connection with FIG. **1***b*.

As illustrated in FIG. **2**, multiple users, each having their own client input device, may issue requests, simultaneously or otherwise, for navigation of data source **210**. This is equally true (though not explicitly drawn) for the embodiments depicted in FIGS. **1***a* and **1***b*. Data source **210** (or **100**), being a network accessible information resource, has typically already been constructed to support access requests from simultaneous multiple network users, as known by practitioners of ordinary skill in the art. In the case of server-side speech processing, as exemplified in FIGS. **1***a* and **2**, the interpretation logic and error correction logic modules are also preferably designed and implemented to support queuing and multi-tasking of requests from multiple simultaneous network users, as will be appreciated by those of skill in the art.

It will be apparent to those skilled in the art that additional implementations, permutations and combinations of the embodiments set forth in FIGS. **1***a*, **1***b*, and **2** may be created without straying from the scope and spirit of the present invention. For example, practitioners will understand, in light of the above teachings and design considerations, that it is possible to divide and allocate the functional components of request processing logic **300** between client and server. For example, speech recognition—in entirety, or perhaps just early stages such as feature extraction—might be performed locally on the client end, perhaps to reduce bandwidth requirements, while natural language parsing and other necessary processing might be performed upstream on the server end, so that more extensive computational power need not be distributed locally to each client. In that case, corresponding portions of request processing logic **300**, such as speech recognition engine **310** or portions thereof, would reside locally at the client as in FIG. **1***b*, while other component modules would be hosted at the server end as in FIGS. **1***a* and **2**.

Further, practitioners may choose to implement the each of the various embodiments described above on any number of different hardware and software computing platforms and environments and various combinations thereof, including, by way of just a few examples: a general-purpose hardware microprocessor such as the Intel Pentium series; operating system software such as Microsoft Windows/CE, Palm OS, or Apple Mac OS (particularly for client devices and client-side processing), or Unix, Linux, or Windows/NT (the latter three particularly for network data servers and server-side processing), and/or proprietary information access platforms such as Microsoft's WebTV or the Diva Systems video-on-demand system.

2. Processing Methodology

The present invention provides a spoken natural language interface for interrogation of remote electronic databases and retrieval of desired information. A preferred embodiment of the present invention utilizes the basic methodology outlined in the flow diagram of FIG. **4** in order to provide this interface. This methodology will now be discussed.

a. Interpreting Spoken Natural Language Requests

At step **402**, the user's spoken request for information is initially received in the form of raw (acoustic) voice data by a suitable input device, as previously discussed in connection with FIGS. **1–2**. At step **404** the voice data received from the user is interpreted in order to understand the user's request for information. Preferably this step includes performing speech recognition in order to extract words from the voice data, and further includes natural language parsing of those words in order to generate a structured linguistic representation of the user's request.

Speech recognition in step **404** is performed using speech recognition engine **310**. A variety of commercial quality, speech recognition engines are readily available on the market, as practitioners will know. For example, Nuance Communications offers a suite of speech recognition engines, including Nuance 6, its current flagship product, and Nuance Express, a lower cost package for entry-level applications. As one other example, IBM offers the ViaVoice speech recognition engine, including a low-cost shrink-wrapped version available through popular consumer distribution channels. Basically, a speech recognition engine processes acoustic voice data and attempts to generate a text stream of recognized words.

Typically, the speech recognition engine is provided with a vocabulary lexicon of likely words or phrases that the recognition engine can match against its analysis of acoustical signals, for purposes of a given application. Preferably, the lexicon is dynamically adjusted to reflect the current user context, as established by the preceding user inputs. For example, if a user is engaged in a dialogue with the system about movie selection, the recognition engine's vocabulary may preferably be adjusted to favor relevant words and phrases, such as a stored list of proper names for popular movie actors and directors, etc. Whereas if the current dialogue involves selection and viewing of a sports event, the engine's vocabulary might preferably be adjusted to favor a stored list of proper names for professional sports teams, etc. In addition, a speech recognition engine is provided with language models that help the engine predict the most likely interpretation of a given segment of acoustical voice data, in the current context of phonemes or words in which the segment appears. In addition, speech recognition engines often echo to the user, in more or less real-time, a transcription of the engine's best guess at what the user has said, giving the user an opportunity to confirm or reject.

In a further aspect of step **404**, natural language interpreter (or parser) **320** linguistically parses and interprets the textual output of the speech recognition engine. In a preferred embodiment of the present invention, the natural-language interpreter attempts to determine both the meaning of spoken words (semantic processing) as well as the grammar of the statement (syntactic processing), such as the Gemini Natural Language Understanding System developed by SRI International. The Gemini system is described in detail in publications entitled "Gemini: A Natural Language System for Spoken-Language Understanding" and "Interleaving Syntax and Semantics in an Efficient Bottom-Up Parser," both of which are currently available online at http://www.ai.sri.com/natural-language/projects/arpa-sls/nat-lang.html. (Copies of those publications are also included in an information disclosure statement submitted herewith, and are incorporated herein by this reference). Briefly, Gemini applies a set of syntactic and semantic grammar rules to a word string using a bottom-up parser to generate a logical form, which is a structured representation of the context-independent meaning of the string. Gemini can be used with a variety of grammars, including general English grammar as well as application-specific grammars. The Gemini parser is based on "unification grammar," meaning that grammatical categories incorporate features that can be assigned values; so that when grammatical category expressions are matched in the course of parsing or semantic interpretation, the information contained in the features is combined, and if the feature values are incompatible the match fails.

It is possible for some applications to achieve a significant reduction in speech recognition error by using the natural-language processing system to re-score recognition hypotheses. For example, the grammars defined for a language parser like Gemini may be compiled into context-free grammar that, in turn, can be used directly as language models for speech recognition engines like the Nuance recognizer. Further details on this methodology are provided in the publication "Combining Linguistic and Statistical Knowledge Sources in Natural-Language Processing for ATIS" which is currently available online through http://www.ai.sri.com/natural-language/projects/arpa-sls/spnl-int.html. A copy of this publication is included in an information disclosure submitted herewith, and is incorporated herein by this reference.

In an embodiment of the present invention that may be preferable for some applications, the natural language interpreter "learns" from the past usage patterns of a particular user or of groups of users. In such an embodiment, the successfully interpreted requests of users are stored, and can then be used to enhance accuracy by comparing a current request to the stored requests, thereby allowing selection of a most probable result.

b. Constructing Navigation Queries

In step **405** request processing logic **300** identifies and selects an appropriate online data source where the desired information (in this case, current weather reports for a given city) can be found. Such selection may involve look-up in a locally stored table, or possibly dynamic searching through an online search engine, or other online search techniques. For some applications, an embodiment of the present invention may be implemented in which only access to a particular data source (such as a particular vendor's proprietary content database) is supported; in that case, step **405** may be trivial or may be eliminated entirely.

Step **406** attempts to construct a navigation query, reflecting the interpretation of step **404**. This operation is preferably performed by query construction logic **330**.

A "navigation query" means an electronic query, form, series of menu selections, or the like; being structured appropriately so as to navigate a particular data source of interest in search of desired information. In other words, a navigation query is constructed such that it includes whatever content and structure is required in order to access desired information electronically from a particular database or data source of interest.

For example, for many existing electronic databases, a navigation query can be embodied using a formal database query language such as Standard Query Language (SQL). For many databases, a navigation query can be constructed through a more user-friendly interactive front-end, such as a series of menus and/or interactive forms to be selected or filled in. SQL is a standard interactive and programming language for getting information from and updating a database. SQL is both an ANSI and an ISO standard. As is well known to practitioners, a Relational Database Management System (RDBMS), such as Microsoft's Access, Oracle's Oracle7, and Computer Associates' CA-OpenIngres, allow programmers to create, update, and administer a relational database. Practitioners of ordinary skill in the art will be thoroughly familiar with the notion of database navigation through structured query, and will be readily able to appreciate and utilize the existing data structures and navigational mechanisms for a given database, or to create such structures and mechanisms where desired.

In accordance with the present invention, the query constructed in step **406** must reflect the user's request as interpreted by the speech recognition engine and the NL parser in step **404**. In embodiments of the present invention wherein data source **110** (or **210** in the corresponding embodiment of FIG. **2**) is a structured relational database or the like, step **406** of the present invention may entail constructing an appropriate Structured Query Language (SQL) query or the like, or automatically filling out a front-end query form, series of menus or the like, as described above.

In many existing Internet (and Intranet) applications, an online electronic data source is accessible to users only through the medium of interaction with a so-called Common Gateway Interface (CGI) script. Typically the user who visits a web site of this nature must fill in the fields of an online interactive form. The online form is in turn linked to a CGI script, which transparently handles actual navigation of the associated data source and produces output for viewing by the user's web browser. In other words, direct user access to the data source is not supported, only mediated access through the form and CGI script is offered.

For applications of this nature, an advantageous embodiment of the present invention "scrapes" the scripted online site where information desired by a user may be found in order to facilitate construction of an effective navigation query. For example, suppose that a user's spoken natural language request is: "What's the weather in Miami?" After this request is received at step **402** and interpreted at step **404**, assume that step **405** determines that the desired weather information is available online through the medium of a CGI-scripted interactive form. Step **406** is then preferably carried out using the expanded process diagrammed in FIG. **5**. In particular, at sub-step **520**, query construction logic **330** electronically "scrapes" the online interactive form, meaning that query construction logic **330** automatically extracts the format and structure of input fields accepted by the online form. At sub-step **522**, a navigation query is then constructed by instantiating (filling in) the extracted input format—essentially an electronic template—in a manner reflecting the user's request for information as interpreted in step **404**. The flow of control then returns to step **407** of FIG. **4**. Ultimately, when the query thus constructed by scraping is used to navigate the online data source in step **408**, the query effectively initiates the same scripted response as if a human user had visited the online site and had typed appropriate entries into the input fields of the online form.

In the embodiment just described, scraping step **520** is preferably carried out with the assistance of an online extraction utility such as WebL. WebL is a scripting language for automating tasks on the World Wide Web. It is an imperative, interpreted language that has built-in support for common web protocols like HTTP and FTP, and popular data types like HTML and XML. WebL's implementation language is Java, and the complete source code is available from Compaq. In addition, step **520** is preferably performed dynamically when necessary—in other words, on-the-fly in response to a particular user query—but in some applications it may be possible to scrape relatively stable (unchanging) web sites of likely interest in advance and to cache the resulting template information.

It will be apparent, in light of the above teachings, that preferred embodiments of the present invention can provide a spoken natural language interface atop an existing, non-voice data navigation system, whereby users can interact by means of intuitive natural language input not strictly conforming to the linear browsing architecture or other artifacts of an existing menu/text/click navigation system. For example, users of an appropriate embodiment of the present invention for a video-on-demand application can directly speak the natural request: "Show me the movie 'Unforgiven'"—instead of walking step-by-step through a typically linear sequence of genre/title/actor/director menus, scrolling and selecting from potentially long lists on each menu, or instead of being forced to use an alphanumeric keyboard that cannot be as comfortable to hold or use as a lightweight remote control. Similarly, users of an appropriate embodiment of the present invention for a web-surfing application in accordance with the process shown in FIG. **5** can directly speak the natural request: "Show me a one-month price chart for Microsoft stock"—instead of potentially having to navigate to an appropriate web site, search for the right ticker symbol, enter/select the symbol, and specify display of the desired one-month price chart, each of those steps potentially involving manual navigation and data entry to one or more different interaction screens. (Note that these examples are offered to illustrate some of the potential benefits offered by appropriate embodiments of the present invention, and not to limit the scope of the invention in any respect.)

c. Error Correction

Several problems can arise when attempting to perform searches based on spoken natural language input. As indicated at decision step **407** in the process of FIG. **4**, certain deficiencies may be identified during the process of query construction, before search of the data source is even attempted. For example, the user's request may fail to specify enough information in order to construct a navigation query that is specific enough to obtain a satisfactory search result. For example, a user might orally request "what's the weather?" whereas the national online data source identified in step **405** and scraped in step **520** might require specifying a particular city.

Additionally, certain deficiencies and problems may arise following the navigational search of the data source at step **408**, as indicated at decision step **409** in FIG. **4**. For example, with reference to a video-on-demand application, a user may wish to see the movie "Unforgiven", but perhaps the user can't recall name of the film, but knows it was directed by and starred actor Clint Eastwood. A typical video-on-demand database might indeed be expected to allow queries specifying the name of a leading actor and/or director, but in the case of this query—as in many cases—that will not be enough to narrow the search to a single film, and additional user input in some form is required.

In the event that one or more deficiencies in the user's spoken request, as processed, result in the problems described, either at step **407** or **409**, some form of error handling is in order. A straightforward, crude technique might be for the system to respond simply "input not understood/insufficient; please try again." However, that approach will likely result in frustrated users, and is not optimal or even acceptable for most applications. Instead, a preferred technique in accordance with the present invention handles such errors and deficiencies in user input at step **412**, whether detected at step **407** or step **409**, by soliciting additional input from the user in a manner taking advantage of the partial construction already performed and via user interface modalities in addition to spoken natural language ("multi-modality"). This supplemental interaction is preferably conducted through client display device **112** (**202**, in the embodiment of FIG. **2**), and may include textual, graphical, audio and/or video media. Further details and examples are provided below. Query refinement logic **340** preferably carries out step **412**. The additional input received from the user is fed into and augments interpreting step **404**, and query construction step **406** is likewise repeated with the benefit of the augmented interpretation. These operations, and subsequent navigation step **408**, are preferably repeated until no remaining problems or deficiencies are identified at decision points **407** or **409**. Further details and examples for this query refinement process are provided immediately below.

Consider again the example in which the user of a video-on-demand application wishes to see "Unforgiven" but can only recall that it was directed by and starred Clint Eastwood. First, it bears noting that using a prior art navigational interface, such as a conventional menu interface, will likely be relatively tedious in this case. The user can proceed through a sequence of menus, such as Genre (select "western"), Title (skip), Actor ("Clint Eastwood"), and Director ("Clint Eastwood"). In each case—especially for the last two items—the user would typically scroll and select from fairly long lists in order to enter his or her desired name, or perhaps use a relatively couch-unfriendly keypad to manually type the actor's name twice.

Using a preferred embodiment of the present invention, the user instead speaks aloud, holding remote control microphone **102**, "I want to see that movie starring and directed by Clint Eastwood. Can't remember the title." At step **402** the voice data is received. At step **404** the voice data is interpreted. At step **405** an appropriate online data source is selected (or perhaps the system is directly connected to a proprietary video-on-demand provider). At step **406** a query is automatically constructed by the query construction logic **330** specifying "Clint Eastwood" in both the actor and director fields. Step **407** detects no obvious problems, and so the query is electronically submitted and the data source is navigated at step **408**, yielding a list of several records satisfying the query (e.g., "Unforgiven", "True Crime", "Absolute Power", etc.). Step **409** detects that additional user input is needed to further refine the query in order to select a particular film for viewing.

At that point, in step **412** query refinement logic **340** might preferably generate a display for client display device **112** showing the (relatively short) list of film titles that satisfy the user's stated constraints. The user can then preferably use a relatively convenient input modality, such as buttons on the remote control, to select the desired title from the menu. In a further preferred embodiment, the first title on the list is highlighted by default, so that the user can simply press an "OK" button to choose that selection. In a further preferred feature, the user can mix input modalities by speaking a response like "I want number one on the list." Alternatively, the user can preferably say, "Let's see Unforgiven," having now been reminded of the title by the menu display.

Utilizing the user's supplemental input, request processing logic **300** iterates again through steps **404** and **406**, this time constructing a fully-specified query that specifically requests the Eastwood film "Unforgiven." Step **408** navigates the data source using that query and retrieves the desired film, which is then electronically transmitted in step **410** from network server **108** to client display device **112** via communications network **106**.

Now consider again the example in which the user of a web surfing application wants to know his or her local weather, and simply asks, "what's the weather?" At step **402** the voice data is received. At step **404** the voice data is interpreted. At step **405** an online web site providing current weather information for major cities around the world is selected. At step **406** and sub-step **520**, the online site is scraped using a WebL-style tool to extract an input template for interacting with the site. At sub-step **522**, query construction logic **330** attempts to construct a navigation query by instantiating the input template, but determines (quite rightly) that a required field—name of city—cannot be determined from the user's spoken request as interpreted in step **404**. Step **407** detects this deficiency, and in step **412** query refinement logic **340** preferably generates output for client display device **112** soliciting the necessary supplemental input. In a preferred embodiment, the output might display the name of the city where the user is located highlighted by default. The user can then simply press an "OK" button—or perhaps mix modalities by saying "yes, exactly"—to choose that selection. A preferred embodiment would further display an alphabetical scrollable menu listing other major cities, and/or invite the user to speak or select the name of the desired city.

Here again, utilizing the user's supplemental input, request processing logic **300** iterates through steps **404** and **406**. This time, in performing sub-step **520**, a cached version of the input template already scraped in the previous iteration might preferably be retrieved. In sub-step **522**, query construction logic **330** succeeds this time in instantiating the input template and constructing an effective query, since the desired city has now been clarified. Step **408** navigates the data source using that query and retrieves the desired weather information, which is then electronically transmitted in step **410** from network server **108** to client display device **112** via communications network **106**.

It is worth noting that in some instances, there may be details that are not explicitly provided by the user, but that query construction logic **330** or query refinement logic **340** may preferably deduce on their own through reasonable assumptions, rather than requiring the use to provide explicit clarification. For example, in the example previously described regarding a request for a weather report, in some applications it might be preferable for the system to simply assume that the user means a weather report for his or her home area and to retrieve that information, if the cost of doing so is not significantly greater than the cost of asking the user to clarify the query. Making such an assumption might be even more strongly justified in a preferred embodiment, as described earlier, where user histories are tracked, and where such history indicates that a particular user or group of users typically expect local information when asking for a weather forecast. At any rate, in the event such an assumption is made, if the user actually intended to request the weather for a different city, the user would then need to ask his or her question again. It will be apparent to practitioners, in light of the above teachings, that the choice of whether to program query construction logic **330** and query refinement logic **340** to make particular assumptions will typically involve trade-offs involving user convenience that can be assessed in the context of specific applications.

3. Open Agent Architecture (OAA®)

Open Agent Architecture™ (OAA®) is a software platform, developed by the assignee of the present invention, that enables effective, dynamic collaboration among communities of distributed electronic agents. OAA is described in greater detail in co-pending U.S. patent application Ser. No. 09/225,198, which has been incorporated herein by reference. Very briefly, the functionality of each client agent is made available to the agent community through registration of the client agent's capabilities with a facilitator. A software "wrapper" essentially surrounds the underlying application program performing the services offered by each client. The common infrastructure for constructing agents is preferably supplied by an agent library. The agent library is preferably accessible in the runtime environment of several different programming languages. The agent library preferably minimizes the effort required to construct a new system and maximizes the ease with which legacy systems can be "wrapped" and made compatible with the agent-based architecture of the present invention. When invoked, a client agent makes a connection to a facilitator, which is known as its parent facilitator. Upon connection, an agent registers with its parent facilitator a specification of the capabilities and services it can provide, using a highlevel, declarative Interagent Communication Language ("ICL") to express those capabilities. Tasks are presented to the facilitator in the form of ICL goal expressions. When a facilitator determines that the registered capabilities of one of its client agents will help satisfy a current goal or sub-goal thereof, the facilitator delegates that subgoal to the client agent in the form of an ICL request. The client agent processes the request and returns answers or information to the facilitator. In processing a request, the client agent can use ICL to request services of other agents, or utilize other infrastructure services for collaborative work. The facilitator coordinates and integrates the results received from different client agents on various sub-goals, in order to satisfy the overall goal.

OAA provides a useful software platform for building systems that integrate spoken natural language as well as other user input modalities. For example, see the above-referenced co-pending patent application, especially FIG. 13 and the corresponding discussion of a "multi-modal maps" application, and FIG. 12 and the corresponding discussion of a "unified messaging" application. Another example is the InfoWiz interactive information kiosk developed by the assignee and described in the document entitled "InfoWiz: An Animated Voice Interactive Information System" available online at http://www.ai.sri.com/~oaa/applications.html. A copy of the InfoWhiz document is provided in an Information Disclosure Statement submitted herewith and incorporated herein by this reference. A further example is the "CommandTalk" application developed by the assignee for the U.S. military, as described online at http://www.ai.sri.com/~lesaf/commandtalk.html and in the following publications, copies of which are provided in an Information Disclosure Statement submitted herewith and incorporated herein by this reference:

"CommandTalk: A Spoken-Language Interface for Battlefield Simulations", 1997, by Robert Moore, John Dowding, Harry Bratt, J. Mark Gawron, Yonael Gorfu and Adam Cheyer, in "Proceedings of the Fifth Conference on Applied Natural Language Processing", Washington, DC, pp. 1–7, Association for Computational Linguistics

"The CommandTalk Spoken Dialogue System", 1999, by Amanda Stent, John Dowding, Jean Mark Gawron, Elizabeth Owen Bratt and Robert Moore, in "Proceedings of the Thirty-Seventh Annual Meeting of the ACL", pp. 183–190, University of Maryland, College Park, Md., Association for Computational Linguistics

"Interpreting Language in Context in CommandTalk", 1999, by John Dowding and Elizabeth Owen Bratt and Sharon Goldwater, in "Communicative Agents: The Use of Natural Language in Embodied Systems", pp. 63–67, Association for Computing Machinery (ACM) Special Interest Group on Artificial Intelligence (SIGART), Seattle, Wash.

For some applications and systems, OAA can provide an advantageous platform for constructing embodiments of the present invention. For example, a representative application is now briefly presented, with reference to FIG. 6. If the statement "show me movies starring John Wayne" is spoken into the voice input device, the voice data for this request will be sent by UI agent **650** to facilitator **600**, which in turn will ask natural language (NL) agent **620** and speech recognition agent **610** to interpret the query and return the interpretation in ICL format. The resulting ICL goal expression is then routed by the facilitator to appropriate agents—in this case, video-on-demand database agent **640**—to execute the request. Video database agent **640** preferably includes or is coupled to an appropriate embodiment of query construction logic **330** and query refinement logic **340**, and may also issue ICL requests to facilitator **600** for additional assistance—e.g., display of menus and capture of additional user input in the event that query refinement is needed—and facilitator **600** will delegate such requests to appropriate client agents in the community. When the desired video content is ultimately retrieved by video database agent **640**, UI agent **650** is invoked by facilitator **600** to display the movie.

Other spoken user requests, such as a request for the current weather in New York City or for a stock quote, would eventually lead facilitator to invoke web database agent **630** to access the desired information from an appropriate Internet site. Here again, web database agent **630** preferably includes or is coupled to an appropriate embodiment of query construction logic **330** and query refinement logic **340**, including a scraping utility such as WebL. Other spoken requests, such as a request to view recent emails or access voice mail, would lead the facilitator to invoke the appropriate email agent **660** and/or telephone agent **680**. A request to record a televised program of interest might lead facilitator **600** to invoke web database agent **630** to return televised program schedule information, and then invoke VCR controller agent **680** to program the associated VCR unit to record the desired television program at the scheduled time.

Control and connectivity embracing additional electronic home appliances (e.g., microwave oven, home surveillance system, etc.) can be integrated in comparable fashion. Indeed, an advantage of OAA-based embodiments of the present invention, that will be apparent to practitioners in light of the above teachings and in light of the teachings disclosed in the cited co-pending patent applications, is the relative ease and flexibility with which additional service agents can be plugged into the existing platform, immediately enabling the facilitator to respond dynamically to spoken natural language requests for the corresponding services.

4. Further Embodiments and Equivalents

While the present invention has been described in terms of several preferred embodiments, there are many alterations, permutations, and equivalents that may fall within the scope of this invention. It should also be noted that there are many alternative ways of implementing the methods and apparatuses of the present invention. It is therefore intended that the following appended claims be interpreted as including all such alterations, permutations, and equivalents as fall within the true spirit and scope of the present invention.

What is claimed is:

1. A method for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising the steps of:

(a) receiving a spoken request for desired information from the user;

(b) rendering an interpretation of the spoken request;

(c) constructing at least part of a navigation query based upon the interpretation;

(d) soliciting additional input from the user, including user interaction in a non-spoken modality different than the original request without requiring the user to request said non-spoken modality;

(e) refining the navigation query, based upon the additional input;

(f) using the refined navigation query to select a portion of the electronic data source; and

(g) transmitting the selected portion of the electronic data source from the network server to a client device of the user.

2. The method of claim **1**, wherein the step of rendering an interpretation further includes deriving linguistic information by using a speech recognition engine and a linguistic parser.

3.The method of claim **1**, wherein the step of constructing a navigation query further includes the steps of extracting an input template for an online scripted interface to the data source, and using the input template to construct the navigation query.

4. The method of claim **3**, wherein the step of extracting the input template includes dynamically scraping the online scripted interface.

5. The method of claim **1**, wherein the navigation query is constructed in the format of a database query language.

6. The method of claim **1**, wherein the step of rendering an interpretation and the step of constructing a navigation query are performed, at least in part, on a computing device located locally with the user.

7. The method of claim **1**, wherein the step of rendering an interpretation and the step of constructing a navigation query are performed, at least in part, on a network computing device located remotely from the user.

8. The method of claim **1**, wherein the step of soliciting additional input is performed in response to one or more deficiencies encountered during the step of constructing a navigation query.

9. The method of claim **8**, wherein the deficiencies include unresolved words of the spoken request.

10. The method of claim **8**, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken request.

11.The method of claim **1**, wherein the step of soliciting additional input is performed in response to one or more deficiencies encountered after a first navigation of the data source using the navigation query constructed in step (c).

12. The method of claim **11**, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

13. The method of claim **11**, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

14. The method of claim **1**, wherein the additional input is solicited upon receiving a user-input statement that additional information is required.

15. The method of claim **1**, wherein the step of soliciting the additional input includes presenting a menu to the user on the client device of the user.

16. The method of claim **1**, wherein the step of soliciting the additional input includes presenting a textual request for the additional input.

17. The method of claim **1**, wherein the step of soliciting the additional input includes an audible request for the additional input.

18. The method of claim **1**, wherein the step of soliciting the additional input includes presenting a list of portions of the electronic data source that match the navigational query.

19. The method of claim **1**, wherein additional input received from the user is at least partially speech based.

20. The method of claim **1**, wherein additional input received from the user includes no spoken input.

21. The method of claim **1**, wherein steps (d)–(e) are repeated until the navigational query is deemed adequate.

22. The method of claim **1**, wherein the input modality of step (d) includes selecting from a displayed option menu.

23. The method of claim **22**, wherein the act of selecting from the displayed option menu is performed by speaking.

24. The method of claim **1**, wherein the method is performed with respect to a plurality of simultaneous users and corresponding client devices.

25. The method of claim **1**, further including the step of selecting the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken request.

26. The method of claim **1**, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

27. A system for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, the system comprising:

(a) a portable microphone operable to receive a spoken request for desired information from the user;

(b) language processing logic, operable to render an interpretation of the spoken request;

(c) query construction logic, operable to construct a navigation query in response to the interpretation of the spoken request;

(d) user interaction logic, operable to solicit additional input from the user, including user interaction in a non-spoken modality different than the original request without requiring the user to request said non-spoken modality;

(e) query refining logic, operable to refine the navigation query, based upon the additional input;

(f) navigation logic, operable to select a portion of the electronic data source using the navigation query; and

(g) electronic communications infrastructure for transmitting the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user.

28. The system of claim 27, wherein the language processing logic includes speech recognition logic and an linguistic parsing logic for deriving linguistic information.

29. The system of claim 27, wherein the language processing logic extracts an input template for an online scripted interface to the data source, and uses the input template to construct the navigation query.

30. The system of claim 29, wherein the language processing logic dynamically scrapes the online scripted interface.

31. The system of claim 27, wherein the query construction logic constructs the query in the format of a database query language.

32. The system of claim 27, wherein at least a portion of the language processing logic is hosted on a computing device located locally with the user, and wherein the portable microphone is electronically coupled to the local computing device.

33. The system of claim 27, wherein at least a portion of the language processing logic is hosted on a network computing device located remotely from the user, and wherein the portable microphone sends data to the remote network computing device via the communications infrastructure.

34. The system of claim 27, wherein the user interaction logic solicits additional input in response to one or more deficiencies encountered during construction of the navigation query.

35. The system of claim 34, wherein the deficiencies include unresolved words of the spoken request.

36. The system of claim 34, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken request.

37. The system of claim 27, wherein the user interaction logic solicits additional input in response to one or more deficiencies encountered after a first navigation of the data source performed by the navigation logic.

38. The system of claim 31, wherein the deficiencies include existence of more than one date record within the data source responsive to the navigation query.

39. The system of claim 31, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

40. The system of claim 27, wherein the user Interaction logic displays an option menu.

41. The system of claim 40, wherein the act of selecting from the displayed option menu is performed by speaking.

42. The system of claim 27, wherein the navigation logic selects the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken request.

43. The system of claim 27, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

44. The system of claim 27, wherein the display device receives data from the electronic data source on the network servers via a communications box.

45. The system of claim 27, wherein the electronic communication infrastructure is a two-way infrastructure and is selected from among one or more of the following group: {coaxial cable, DSL, satellite, wireless/cellular, fiber-optic}.

46. A computer program embodied on a computer readable medium for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising:

(a) a code segment that receives a spoken request for desired information from the user;

(b) a code segment that renders an interpretation of the spoken request;

(c) a code segment that constructs at least part of a navigation query based upon the interpretation;

(d) a code segment that solicits additional input from the user, including user interaction in a non-spoken modality different than the original request without requiring the user to request said non-spoken modality;

(e) a code segment that refines the navigation query, based upon the additional input;

(f) a code segment that uses the refined navigation query to select a portion of the electronic data source; and

(g) a code segment that transmits the selected portions of the electronic data source from the network server to a primarily stationary, display device located locally with the user.

47. The computer program of claim 46, further comprising a code segment that derives linguistic information by using a speech recognition engine and a linguistic parser.

48. The computer program of claim 46, further comprising a code segment that extract an input template for an online scripted interface to the data source, and a code segment that uses the input template to construct the navigation query.

49. The computer program of claim 48, further comprising a code segment that dynamically scrapes the online scripted interface.

50. The computer program of claim 46, wherein the navigation query is constructed in the format of a database query language.

51. The computer program of claim 46, wherein rendering of the interpretation and the construction of the navigation query are performed, at least in part, on a computing device located locally with the user.

52. The compute program of claim 46, wherein the rendering of the interpretation and the construction of a navigation query are performed, at least in part, on a network computing device located remotely from the user.

53. The computer program of claim 46, wherein code segment that solicits additional input solicits the additional input in response to one or more deficiencies encountered during the constructing of the navigation query.

54. The computer program of claim 53, wherein the deficiencies include unresolved words of the spoken request.

55. The computer program of claim 53, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken request.

56. The computer program of claim 46, wherein the code segment that solicits the additional input solicits the additional input in response to one or more deficiencies encountered after a first navigation of the data source.

57. The computer program of claim 56, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

58. The computer program of claim 57, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

59. The computer program of claim 46, wherein code segment that solicits additional Input displays an option menu.

60. The computer program of claim 59, wherein the act of selecting from the displayed option menu is performed by speaking.

61. The computer program of claim **46**, wherein the code segments of the computer program operate with respect to a plurality of simultaneous users and corresponding client devices.

62. The computer program of claim **46**, further comprising a code segment that selects the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken request.

63. The computer program of claim **46**, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

64. The computer program of claim **46**, wherein the additional input is solicited upon receiving a user-input statement that additional information is required.

65. The computer program of claim **46**, wherein the code segment that solicits the additional input includes a code segment that presents a menu to the user on the client device of the user.

66. The computer program of claim **46**, wherein the code segment that solicits the additional input includes a code segment that presents a textual request for the additional input.

67. The computer program of claim **46**, wherein the code segment that solicits the additional input includes a code segment that produces an audible request for the additional input.

68. The computer program of claim **46**, wherein the code segment that solicits the additional input includes a code segment that presents a list of portions of the electronic data source that match the navigational query.

69. The computer program of claim **46**, wherein additional input received from the user is at least partially speech based.

70. The computer program of claim **46**, wherein additional input received from the user includes no spoken input.

71. The compute program of claim **46**, wherein code segments (d)–(e) are repeated until the navigational query is deemed adequate.

72. A method for utilizing spoken natural language for navigating an electronic data source, the electronic data source being located at one or more network servers located remotely from a user; comprising the steps of:

(a) receiving a spoken natural language ("NL") request for desired information from the user;

(b) rendering an interpretation of the spoken request;

(c) constructing at least part of a navigation query based upon the interpretation;

(d) soliciting additional input from the user, including user interaction in a non-spoken modality different than the original request without requiring the user to request said non-spoken modality;

(e) refining the navigation query, based upon the additional input;

(f) using the refined navigation query to select a portion of the electronic data source; and

(g) transmitting the selected portion of the electronic data source from the network server to a client device,of the user.

73. The method of claim **72**, wherein the step of rendering an interpretation further includes deriving linguistic information by using a speech recognition engine and an NL parser.

74. The method of claim **72**, wherein the step of constructing a navigation query further includes the steps of extracting an input template for an online scripted interface to the data source, and using the input template to construct the navigation query.

75. The method of claim **74**, wherein the step of extracting an input template includes dynamically scraping the online scripted interface.

76. The method of claim **72**, wherein the navigation query is constructed in the format of a database query language.

77. The method of claim **72**, wherein the step of rendering an interpretation and the step of constructing a navigation query are performed, at least in part, on a computing device located locally with the user.

78. The method of claim **72**, wherein the step of rendering an interpretation and the step of constructing a navigation query are performed, at least in part, on a network computing device located remotely from the user.

79. The method of claim **72**, wherein the step of soliciting additional input is performed in response to one or more deficiencies encountered during the step of constructing a navigation query.

80. The method of claim **79**, wherein the deficiencies include unresolved words of the spoken NL request.

81. The method of claim **79**, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken NL request.

82. The method of claim **72**, wherein the step of soliciting additional input is performed in response to one or more deficiencies encountered after a first navigation of the data source using the navigation query constructed in step (c).

83. The method of claim **82**, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

84. The method of claim **82**, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

85. The method of claim **72**, wherein the input modality of step (d) includes selecting from a displayed option menu.

86. The method of claim **85**, wherein the act of selecting from the displayed option menu is performed by speaking.

87. The method of claim **72**, wherein the method is performed with respect to a plurality of simultaneous users and corresponding client devices.

88. The method of claim **72**, further including the step of selecting the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken NL request.

89. The method of claim **72**, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

90. A system or utilizing spoken natural language to navigate an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, the system comprising:

(a) a portable microphone operable to receive a spoken natural language ("NL") request for desired information from the user;

(b) spoken language processing logic, operable to render an interpretation of the spoken natural language request;

(c) query construction logic, operable to construct a navigation query in response to the interpretation of the spoken natural language request;

(d) user interaction logic, operable to solicit additional input from the user, including user interaction in a non-spoken modality different than the original request without requiring the user to request said non-spoken modality;

(e) query refining logic, operable to refine the navigation query, based upon the additional input;

(f) navigation logic, operable to select a portion of the electronic data source using the navigation query; and

(g) electronic communications infrastructure for transmitting the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user.

91. The system of claim **90**, wherein the spoken language processing logic includes speech recognition logic and an NL parsing logic for deriving linguistic information.

92. The system of claim **90**, wherein the spoken language processing logic extracts an input template for an online scripted interface to the data source, and uses the input template to construct the navigation query.

93. The system of claim **90**, wherein the spoken language processing logic dynamically scrapes the online scripted interface.

94. The system of claim **90**, wherein the query construction logic constructs the query in the format of a database query language.

95. The system of claim **90**, wherein at least a portion of the spoken language processing logic is hosted on a computing device located locally with the user, and wherein the portable microphone is electronically coupled to the local computing device.

96. The system of claim **90**, wherein at least a portion of the spoken language processing logic is hosted on a network computing device located remotely from the user, and wherein the portable microphone sends data to the remote network computing device via the communications infrastructure.

97. The system of claim **90**, wherein the user interaction logic solicits additional input in response to one or more deficiencies encountered during construction of the navigation query.

98. The system of claim **97**, wherein the deficiencies include unresolved words of the spoken NL request.

99. The system of claim **97**, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken NL request.

100. The system of claim **90**, wherein the user interaction logic solicits additional input in response to one or more deficiencies encountered after a first navigation of the data source performed by the navigation logic.

101. The system of claim **100**, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

102. The system of claim **100**, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

103. The system of claim **100**, wherein the user interaction logic displays an option menu.

104. The system of claim **103**, wherein the act of selecting from the displayed option menu is performed by speaking.

105. The system of claim **90**, wherein the navigation logic selects the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken NL request.

106. The system of claim **90**, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

107. The system of claim **90**, wherein the display device receives data from the electronic data source on the network servers via a communications box.

108. The system of claim **90**, wherein the electronic communication infrastructure is a two-way infrastructure and is selected from among one or more of the following group: {coaxial cable, DSL, satellite, wireless/cellular, fiber-optic}.

109. A computer program embodied on a computer readable medium for utilizing spoken natural language for navigating an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising:

(a) a code segment that receives a spoken natural language ("NL") request for desired information from the user;

(b) a code segment that renders an interpretation of the spoken natural language request,

(c) a code segment that constructs at least part of a navigation query based upon the interpretation;

(d) a code segment that solicits additional input from the user, including user interaction in a non-spoken modality different than the original request without requiring the user to request said non-spoken modality;

(e) a code segment that refines the navigation query, based upon the additional inputs;

(f) a code segment that uses the refined navigation query to select a portion of the electronic data source; and

(g) a code segment that transmits the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user.

110. The computer program of claim **109**, further comprising a code segment that derives linguistic information by using a speech recognition engine and an NL parser.

111. The computer program of claim **109**, further comprising a code segment that extract an input template for an online scripted interface to the data source, and a code segment that uses the input template to construct the navigation query.

112. The computer program of claim **111**, further comprising a code segment that dynamically scrapes the online scripted interface.

113. The computer program of claim **109**, wherein the navigation query is constructed in the format of a database query language.

114. The computer program of claim **109**, wherein rendering of the interpretation and the construction of the navigation query are performed, at least in part, on a computing device located locally with the user.

115. The computer program of claim **109**, wherein the rendering of the interpretation and the construction of a navigation query are performed, at least in part, on a network computing device located remotely from the user.

116. The computer program of claim **109**, wherein code segment that solicits additional input solicits the additional input in response to one or more deficiencies encountered during the constructing of the navigation query.

117. The computer program of claim **116**, wherein the deficiencies include unresolved words of the spoken NL request.

118. The computer program of claim **116**, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken NL request.

119. The computer program of claim **109**, wherein the code segment that solicits the additional input solicits the additional input in response to one or more deficiencies encountered after a first navigation of the data source.

120. The computer program of claim **119**, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

121. The computer program of claim **119**, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

122. The computer program of claim **109**, wherein code segment that solicits additional input displays an option menu.

123. The computer program of claim **122**, wherein the act of selecting from the displayed option menu is performed by speaking.

124. The computer program of claim **109**, wherein the code segments of the computer program operate with respect to a plurality of simultaneous users and corresponding client devices.

125. The computer program of claim **109**, further comprising a code segment that selects the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken NL request.

126. The computer program of claim **109**, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

127. A method for utilizing spoken natural language for navigating an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising the steps of:

(a) receiving a spoken natural language ("NL") request for desired information from the user;

(b) rendering an interpretation of the spoken request;

(c) constructing at least part of a navigation query based upon the interpretation;

(d) soliciting additional input from the user, including user interaction in a non-spoken modality different than the original request, in accordance with results generated from said at least part of a navigation query;

(e) refining the navigation query, based upon the additional input;

(f) using the refined navigation query to select a portion of the electronic data source; and

(g) transmitting the selected portion of the electronic data source from the network server to a client device of the user.

128. The method of claim **127**, wherein the input modality of step (d) includes selecting from a displayed option menu.

129. The method of claim **128**, wherein the act of selecting from the displayed option menu is performed by speaking.

130. A method for utilizing spoken natural language for navigating an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising the steps of:

(a) receiving a spoken natural language ("NL") request for desired information from the user;

(b) rendering an interpretation of the spoken request;

(c) constructing at least part of a navigation query based upon the interpretation;

(d) soliciting additional input from the user, including user interaction in a non-spoken modality different than the original request, in response to one or more deficiencies encountered during the step of constructing said at least part of a navigation query;

(e) refining the navigation query, based upon the additional input;

(f) using the refined navigation query to select a portion of the electronic data source; and

(g) transmitting the selected portion of the electronic data source from the network server to a client device of the user.

131. The method of claim **130**, wherein the input modality of step (d) includes selecting from a displayed option menu.

132. The method of claim **131**, wherein the act of selecting from the displayed option menu is performed by speaking.

* * * * *

US Patent & Trademark Office

US 6,742,021
USPTO Transaction Information*

SEQ.[δ]	DATE	DESCRIPTION
1	28 Mar 2016	File Marked Found
2	16 Aug 2006	ENTITY STATUS SET TO UNDISCOUNTED (INITIAL DEFAULT SETTING OR STATUS CHANGE)
3	25 May 2004	Recordation of Patent Grant Mailed
4	06 May 2004	Issue Notification Mailed
5	25 May 2004	Patent Issue Date Used in PTA Calculation
6	13 Apr 2004	Receipt into Pubs
7	07 Apr 2004	Receipt into Pubs
8	16 Mar 2004	Receipt into Pubs
9	11 Mar 2004	Receipt into Pubs
10	11 Mar 2004	Receipt into Pubs
11	09 Mar 2004	Application Is Considered Ready for Issue
12	24 Mar 2003	Issue Fee Payment Verified
13	24 Mar 2003	Workflow - Drawings Finished
14	24 Mar 2003	Workflow - Drawings Matched with File at Contractor
15	03 Mar 2004	Receipt into Pubs
16	24 Oct 2003	Correspondence Address Change
17	24 Mar 2003	New or Additional Drawing Filed
18	13 Aug 2002	Information Disclosure Statement (IDS) Filed
19	13 Aug 2002	Information Disclosure Statement (IDS) Filed
20	29 Apr 2003	Receipt into Pubs
21	24 Mar 2003	Miscellaneous Incoming Letter
22	23 Apr 2003	Receipt into Pubs
23	24 Mar 2003	Workflow - Drawings Received at Contractor
24	24 Mar 2003	Workflow - Drawings Sent to Contractor
25	24 Mar 2003	Issue Fee Payment Received
26	06 Feb 2003	Receipt into Pubs
27	07 Jan 2003	Workflow - File Sent to Contractor
28	06 Jan 2003	Receipt into Pubs
29	04 Jan 2003	Dispatch to Publications
30	19 Dec 2002	Dispatch to Publications
31	16 Dec 2002	Mail Notice of Allowance
32	13 Dec 2002	Notice of Allowance Data Verification Completed
33	18 Nov 2002	Case Docketed to Examiner in GAU
34	18 Nov 2002	Date Forwarded to Examiner
35	05 Aug 2002	Response after Non-Final Action
36	05 Sep 2002	Case Docketed to Examiner in GAU
37	01 Jul 2002	Correspondence Address Change
38	20 May 2002	Case Docketed to Examiner in GAU
39	07 May 2002	Mail Non-Final Rejection
40	06 May 2002	Non-Final Rejection
41	23 Apr 2002	Case Docketed to Examiner in GAU
42	18 Apr 2002	Date Forwarded to Examiner
43	10 Apr 2002	Request for Continued Examination (RCE)
44	18 Apr 2002	Disposal for a RCE / CPA / R129
45	17 Apr 2002	Case Docketed to Examiner in GAU
46	16 Apr 2002	Case Docketed to Examiner in GAU

* Document generated on 01/24/2017 by PATENTEC from official USPTO records, external to this file. Information deemed accurate, but not Certified.

δ Transaction Sequence Number (SEQ.) is unrelated to Paper Number in File Table of contents.

US Patent & Trademark Office

US 6,742,021

USPTO Transaction Information*

SEQ.$^{\delta}$	DATE	DESCRIPTION
47	10 Apr 2002	Request for Extension of Time - Granted
48	10 Apr 2002	Workflow - Request for RCE - Begin
49	03 Apr 2002	Mail Advisory Action (PTOL - 303)
50	02 Apr 2002	Advisory Action (PTOL-303)
51	01 Apr 2002	Case Docketed to Examiner in GAU
52	28 Mar 2002	Case Docketed to Examiner in GAU
53	26 Mar 2002	Case Docketed to Examiner in GAU
54	25 Mar 2002	Correspondence Address Change
55	19 Feb 2002	Mail Advisory Action (PTOL - 303)
56	19 Feb 2002	Advisory Action (PTOL-303)
57	17 Jan 2002	Date Forwarded to Examiner
58	10 Jan 2002	Response after Final Action
59	15 Jan 2002	Mail Examiner Interview Summary (PTOL - 413)
60	08 Jan 2002	Examiner Interview Summary Record (PTOL - 413)
61	10 Oct 2001	Mail Final Rejection (PTOL - 326)
62	09 Oct 2001	Final Rejection
63	05 Oct 2001	Miscellaneous Incoming Letter
64	26 Sep 2001	Change in Power of Attorney (May Include Associate POA)
65	26 Sep 2001	Correspondence Address Change
66	26 Sep 2001	Change in Power of Attorney (May Include Associate POA)
67	26 Sep 2001	Date Forwarded to Examiner
68	21 Sep 2001	Response after Non-Final Action
69	20 Jun 2001	Correspondence Address Change
70	30 Apr 2001	Information Disclosure Statement (IDS) Filed
71	30 Apr 2001	Information Disclosure Statement (IDS) Filed
72	27 Apr 2001	Change in Power of Attorney (May Include Associate POA)
73	27 Apr 2001	Correspondence Address Change
74	27 Apr 2001	Change in Power of Attorney (May Include Associate POA)
75	24 Apr 2001	Mail Non-Final Rejection
76	23 Apr 2001	Non-Final Rejection
77	23 Apr 2001	Case Docketed to Examiner in GAU
78	10 Dec 2000	Change in Power of Attorney (May Include Associate POA)
79	10 Dec 2000	Correspondence Address Change
80	10 Dec 2000	Change in Power of Attorney (May Include Associate POA)
81	26 May 2000	Information Disclosure Statement (IDS) Filed
82	26 May 2000	Information Disclosure Statement (IDS) Filed
83	13 Mar 2000	Information Disclosure Statement (IDS) Filed
84	13 Mar 2000	Information Disclosure Statement (IDS) Filed
85	31 Oct 2000	Case Docketed to Examiner in GAU
86	08 Sep 2000	Application Dispatched from OIPE
87	08 Sep 2000	Application Is Now Complete
88	12 May 2000	Notice Mailed--Application Incomplete--Filing Date Assigned
89	12 May 2000	Correspondence Address Change
90	07 Apr 2000	IFW Scan & PACR Auto Security Review
91	13 Mar 2000	Initial Exam Team nn

* Document generated on 01/24/2017 by PATENTEC from official USPTO records, external to this file. Information deemed accurate, but not Certified.

δ Transaction Sequence Number (SEQ.) is unrelated to Paper Number in File Table of contents.

US Patent & Trademark Office

US 6,742,021
Assignment History*

Assignment: 1 / 2					
Reel / Frame:	011015/0897	Recorded:	08/21/2000	Pages in document:	4
Conveyance:	ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).				
Assignors:	Julia, Luc			Exec. Dt:	06/20/2000
	Voutsas, Dimitris			Exec. Dt:	06/16/2000
	Cheyer, Adam			Exec. Dt:	06/22/2000
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Correspondent:	HICKMAN STEPHENS COLEMAN & HUGHES, LLP RAYMOND E. ROBERTS P.O. BOX 52037 PALO ALTO, CA 94303-0746				

Assignment: 2 / 2					
Reel / Frame:	039857/0097	Recorded:	09/26/2016	Pages in document:	5
Conveyance:	ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).				
Assignor:	Sri International			Exec. Dt:	05/20/2016
Assignee:	IPA TECHNOLOGIES INC. 600 ANTON BLVD. SUITE 1350 COSTA MESA, CALIFORNIA 92626				
Correspondent:	IPA TECHNOLOGIES INC. 600 ANTON BLVD. SUITE 1350 COSTA MESA, CA 92626				

United States Patent and Trademark Office

Office of the Commissioner for Patents

NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK

PATENT #	APPLICATION #	FILING DATE	ISSUE DATE
6742021	09524095	03/13/2000	05/25/2004

Payment Window Status

No maintenance fees are due.

WINDOW	STATUS	FEES
11.5 Year	Closed	Paid

Window	First Day to Pay	Surcharge Starts	Last Day to Pay	Status	Fees
3.5 Year	05/25/2007	11/27/2007	05/27/2008	Closed	Paid
7.5 Year	05/25/2011	11/26/2011	05/25/2012	Closed	Paid
11.5 Year	05/25/2015	11/26/2015	05/25/2016	Closed	Paid

Patent Holder Information

Customer # 25696

Entity Status UNDISCOUNTED

Phone Number 6503204000

Address OPPENHEIMER WOLFF & DONNELLY
P. O. BOX 10356
PALO ALTO, CA 94303
UNITED STATES

09/524095 03/13/00

ISSUE CLASSIFICATION	
Class	Subclass
709	218

PATENT NUMBER 6742021

U.S. UTILITY Patent Application

O.I.P.E.

PATENT DATE MAY 25 2004

SERIAL NUMBER	CONT/PRIOR	CLASS	SUBCLASS	ART UNIT	EXAMINER
/524095	D	709		2621	Backer

APPLICANTS: Christine Halverson, Luc Julia, Dimitris Voutsas, Adam Cheyer

TITLE: Navigating network-based electronic information using spoken natural language input with multimodal error feedback

APPLICANT(S):

PTO-2040 12/99

ISSUING CLASSIFICATION

ORIGINAL		CROSS REFERENCE(S)					
CLASS	SUBCLASS	CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
709	218	707	5	4	102		
INTERNATIONAL CLASSIFICATION							
G06F 15/16							

☐ Continued on Issue Slip Inside File Jacket

TERMINAL DISCLAIMER	DRAWINGS			CLAIMS ALLOWED	
	Sheets Drwg.	Figs. Drwg.	Print Fig.	Total Claims	Print Claim for O.G.
	7	7	4	132	1

☐ The term of this patent subsequent to ____________ (date) has been disclaimed.

(Assistant Examiner) 11/21/02 (Date)

NOTICE OF ALLOWANCE MAILED: ~~12/16/02~~ 12/17/02

☐ The term of this patent shall not extend beyond the expiration date of U.S Patent. No. ____________

JAMES P. TRAMMELL
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3600

(Primary Examiner) 12/11/02 (Date)

ISSUE FEE

Amount Due	Date Paid
~~640~~ 1330	3-24-03

☐ The terminal ____ months of this patent have been disclaimed.

(Legal Instruments Examiner) 1-4-03 (Date)

ISSUE BATCH NUMBER

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FORMAL DRAWINGS

ISSUE FEE

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4

PATENT APPLICATION

09524095

jc530 U.S. PTO
09/524095

INITIALS RSD 4-1-2000

CONTENTS

	Date Received (Incl. C. of M.) or Date Mailed		Date Received (Incl. C. of M.) or Date Mailed
1. Application papers.		42.	
2. 1 fr Decl	5/12/00	43.	
3. EOT Decl Sm Entity	8/21/00	44.	
4. Pre admt. A	7/5/00	45.	
5. Request Status	7/26/00	46.	
6. IDS w/refs	5/26/00	47.	
7. IDS w/refs	3/13/00	48.	
7½ Prel Amdt B	Sep 20, 2000		
8. Power of Attorney	12-4-00	49.	
9. notice of acceptance	12-11-00	50.	
10. Rejection (3 mos)	4/24/01	51.	
11. Revocation/ Power of Attorney	4-16-01	52.	
12. notice of acceptance	4-27-01	53.	
13. Supple. IDS	4-30-01	54.	
14. Chg. of Address	6-11-01	55.	
15. Ext. of time 1	9-21-01	56.	
16. Power of Attorney / Change of address	9-21-01	57.	
17. notice of acceptance	9-26-01	58.	
18. Req. for reconsideration	9-21-01	59.	
19. CFR	10-5-01	60.	
20. Final Rejection 3 months	10/10/01	61.	
21. interview summary	1-15-02	62.	
22. Req For Reconsideration	1-10-02	63.	
23. Advisory Action	2-19-02	64.	
24. Supp. Advisory Action	4-3-02	65.	
25. Ext. of time 3	4-10-02	66.	
26. Req. for RCE	4-10-02	67.	
27. Prel. Amdt 1 C	4-10-02	68.	
28. Rejection (3 mos)	5-7-02	69.	
29. change of address	6-25-02	70.	
30. Response Amdt D	08/05/02	71.	
31. Allowance	12/16/02	72.	
32. Letter RE: Comment	3-24-03	73.	
33. IDS	8/13/02	74.	
34. New Drawings	3/24/03	75.	
35. Formal Drawings (7 shts) set	3/24/03	76.	
36. QUERY	3-15-04	77.	
37.		78.	
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ISSUE SLIP STAPLE AREA (for additional cross references)

POSITION	INITIALS	ID NO.	DATE
FEE DETERMINATION	SO	71058	3/21/00
O.I.P.E. CLASSIFIER	RSD		4-1-2000
FORMALITY REVIEW		71476	5/12/00
RESPONSE FORMALITY REVIEW		71476	9/8/00

INDEX OF CLAIMS

✓ .... Rejected
= .... Allowed
— (Through numeral)... Canceled
÷ .... Restricted
N .... Non-elected
I .... Interference
A .... Appeal
O .... Objected

Claim Final	Claim Original	Date
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Claim Final	Claim Original	4/9/01	10/2/01	5/3/02	11/21/02
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Claim Final	Claim Original	4/9/01	10/2/01	5/3/02	11/21/02
46	101	✓	✓	✓	=
47	102				
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SYMBOLS

- ✓ .... Rejected
- = ... Allowed
- - (Through numeral) Canceled
- \+ .... Restricted
- N .... Non-elected
- I .... Interference
- A .... Appeal
- O .... Objected

Claim Final	Claim Original	Date 11/20/02							
96	151	=							
97	152								
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SEARCHED

Class	Sub.	Date	Exmr.
709	218	4/6/01	F.B
707	5		
	4		
	102		
704	257		
	231		
709	218	11/21/02	F.B

SEARCH NOTES (INCLUDING SEARCH STRATEGY)

	Date	Exmr.
West search	4/6/01	F.B.
West search NPL search IBM disclosure	4/28/02	FB
West search	11/20/02	F.B
NPL	11/20/02	
West	11/21/02	

INTERFERENCE SEARCHED

Class	Sub.	Date	Exmr.
709	218	11/21/02	FB
707	5 4	11	

(RIGHT OUTSIDE)

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UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. 20231
www.uspto.gov

Bib Data Sheet

CONFIRMATION NO. 6294

SERIAL NUMBER	FILING DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
09/524,095	03/13/2000 RULE	709	2155	SRI1P037

APPLICANTS
Christine Halverson, San Jose, CA;
Luc Julia, Menlo Park, CA;
Dimitris Voutsas, Thessaloniki, GREECE;
Adam J. Cheyer, Palo Alto, CA;

** **CONTINUING DATA** **************************
THIS APPLICATION IS A CIP OF 09/225,198 01/05/1999
WHICH CLAIMS BENEFIT OF 60/124,718 03/17/1999
AND CLAIMS BENEFIT OF 60/124,719 03/17/1999
AND CLAIMS BENEFIT OF 60/124,720 03/17/1999

** **FOREIGN APPLICATIONS** ********************

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** 05/12/2000

Foreign Priority claimed ☐ yes ☐ no 35 USC 119 (a-d) conditions met ☐ yes ☐ no ☐ Met after Allowance Verified and Acknowledged ____ Examiner's Signature ____ Initials	STATE OR COUNTRY	SHEETS DRAWING	TOTAL CLAIMS	INDEPENDENT CLAIMS
	CA	7	55	3

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TITLE
Navigating network-based electronic information using spoken natural language input with multimodal error feedback

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SERIAL NUMBER	FILING DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
09/524,095	03/13/2000 RULE –	709	2758	SRI1P037

APPLICANTS

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** CONTINUING DATA *************************

THIS APPLICATION IS A CIP OF 09/225,198 01/05/1999
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WHICH CLAIMS BENEFIT OF 60/124,719 03/17/1999
WHICH CLAIMS BENEFIT OF 60/124,720 03/17/1999

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Foreign Priority claimed	☐ yes ☐ no	CA	7	55	3
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TITLE

Navigating network-based electronic information using spoken input with multimodal error ~~natural language input with multimodal error feedback~~ feedback

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APPLICANTS

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Foreign Priority claimed ☐ yes ☐ no 35 USC 119 (a-d) conditions met ☐ yes ☐ no ☐ Met after Allowance Verified and Acknowledged ____ Examiner's Signature Initials	CA	7	55	3

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** **FOREIGN APPLICATIONS** ********************

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Foreign Priority claimed: ☐ yes ☒ no 35 USC 119 (a-d) conditions met: ☐ yes ☒ no ☐ Met after Allowance Verified and Acknowledged: Examiner's Signature, Initials	CA	7	55	3

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Navigating network-based electronic information using spoken natural language input with multimodal error feedback

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Navigating network-based electronic information using spoken natural language input with multimodal error feedback

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** FOREIGN APPLICATIONS ********************

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Navigating network-based electronic information using spoken ~~natural language input with multimodal error feedback~~ Input with multimodal error feedback

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Navigating Network-Based Electronic Information Using Spoken Natural Language Input with Multimodal Error Feedback

Background of the Invention

This is a Continuation In Part of co-pending U.S. Patent Application No. 09/225,198, filed January 5, 1999, Provisional U.S. Patent Application No. 60/124,718, filed March 17, 1999, Provisional U.S. Patent Application No. 60/124,720, filed March 17, 1999, and Provisional U.S. Patent Application No. 60/124,719, filed March 17, 1999, from which applications priority is claimed and these application are incorporated herein by reference.

The present invention relates generally to the navigation of electronic data by means of spoken natural language requests, and to feedback mechanisms and methods for resolving the errors and ambiguities that may be associated with such requests.

As global electronic connectivity continues to grow, and the universe of electronic data potentially available to users continues to expand, there is a growing need for information navigation technology that allows relatively naïve users to navigate and access desired data by means of natural language input. In many of the most important markets -- including the home entertainment arena, as well as mobile computing -- spoken natural language input is highly desirable, if not ideal. As just one example, the proliferation of high-bandwidth communications infrastructure for the home entertainment market (cable, satellite, broadband) enables delivery of movies-on-demand and other interactive multimedia content to the consumer's home television set. For users to take full advantage of this content stream ultimately requires interactive navigation of content databases in a manner that is too complex for user-friendly selection by means of a traditional remote-control clicker. Allowing spoken natural language requests as the input modality for rapidly searching and accessing desired content is an important objective for a successful consumer entertainment product in a context offering a dizzying range of database content choices. As further examples, this same need to drive navigation of (and transaction with) relatively complex data warehouses using spoken natural language requests applies equally to surfing the Internet/Web or other networks for general information, multimedia content, or e-commerce transactions.

In general, the existing navigational systems for browsing electronic databases and data warehouses (search engines, menus, etc.), have been designed without navigation via spoken natural language as a specific goal. So today's world is full of existing electronic data navigation systems that do not assume browsing via natural spoken commands, but rather assume text and mouse-click inputs (or in the case of TV remote controls, even less). Simply recognizing voice commands within an extremely limited vocabulary and grammar -- the spoken equivalent of button/click input (e.g., speaking "channel 5" selects TV channel 5) -- is really not sufficient by itself to satisfy the objectives described above. In order to deliver a true "win" for users, the voice-driven front-end must accept spoken natural language input in a manner that is intuitive to users. For example, the front-end should not require learning a highly specialized command language or format. More fundamentally, the front-end must allow users to speak directly in terms of what the user ultimately wants -- e.g., "I'd like to see a Western film directed by Clint Eastwood" -- as opposed to speaking in terms of arbitrary navigation structures (e.g., hierarchical layers of menus, commands, etc.) that are essentially artifacts reflecting constraints of the pre-existing text/click navigation system. At the same time, the front-end must recognize and accommodate the reality that a stream of naïve spoken natural language input will, over time, typically present a variety of errors and/or ambiguities: e.g., garbled/unrecognized words (did the user say "Eastwood" or "Easter"?) and under-constrained requests ("Show me the Clint Eastwood movie"). An approach is needed for handling and resolving such errors and ambiguities in a rapid, user-friendly, non-frustrating manner.

What is needed is a methodology and apparatus for rapidly constructing a voice-driven front-end atop an existing, non-voice data navigation system, whereby users can interact by means of intuitive natural language input not strictly conforming to the step-by-step browsing architecture of the existing navigation system, and wherein any errors or ambiguities in user input are rapidly and conveniently resolved. The solution to this need should be compatible with the constraints of a multi-user, distributed environment such as the Internet/Web or a proprietary high-bandwidth content delivery network; a solution contemplating one-at-a-time user interactions at a single location is insufficient, for example.

Sub a2

SUMMARY OF THE INVENTION

The present invention addresses the above needs by providing a system, method, and article of manufacture for navigating network-based electronic data sources in response to spoken NL input requests. When a spoken natural language input request is received from a user, it is interpreted, such as by using a speech recognition engine to extract speech data from acoustic voice signals, and using a natural language parser to linguistically parse the speech data. The interpretation of the spoken natural language request can be performed on a computing device locally with the user or remotely from the user. The resulting interpretation of the request is thereupon used to automatically construct an operational navigation query to retrieve the desired information from one or more electronic network data sources, which is then transmitted to a client device of the user. If the network data source is a database, the navigation query is constructed in the format of a database query language.

Typically, errors or ambiguities emerge in the interpretation of the spoken NL request, such that the system cannot instantiate a complete, valid navigational template. This is to be expected occasionally, and one preferred aspect of the invention is the ability to handle such errors and ambiguities in relatively graceful and user-friendly manner. Instead of simply rejecting such input and defaulting to traditional input modes or simply asking the user to try again, a preferred embodiment of the present invention seeks to converge rapidly toward instantiation of a valid navigational template by soliciting additional clarification from the user as necessary, either before or after a navigation of the data source, via multimodal input, i.e., by means of menu selection or other input modalities including and in addition to spoken natural language. This clarifying, multi-modal dialogue takes advantage of whatever partial navigational information has been gleaned from the initial interpretation of the user's spoken NL request. This clarification process continues until the system converges toward an adequately instantiated navigational template, which is in turn used to navigate the network-based data and retrieve the user's desired information. The retrieved information is transmitted across the network and presented to the user on a suitable client display device.

In a further aspect of the present invention, the construction of the navigation query includes extracting an input template for an online scripted interface to the data source and using the input template to construct the navigation query. The extraction of the input template can include dynamically scraping the online scripted interface.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention, together with further advantages thereof, may best be understood by reference to the following description taken in conjunction with the accompanying drawings in which:

Figure 1a illustrates a system providing a spoken natural language interface for network-based information navigation, in accordance with an embodiment of the present invention with server-side processing of requests;

Figure 1b illustrates another system providing a spoken natural language interface for network-based information navigation, in accordance with an embodiment of the present invention with client-side processing of requests;

Figure 2 illustrates a system providing a spoken natural language interface for network-based information navigation, in accordance with an embodiment of the present invention for a mobile computing scenario;

Figure 3 illustrates the functional logic components of a request processing module in accordance with an embodiment of the present invention;

Figure 4 illustrates a process utilizing spoken natural language for navigating an electronic database in accordance with one embodiment of the present invention;

Figure 5 illustrates a process for constructing a navigational query for accessing an online data source via an interactive, scripted (e.g., CGI) form; and

Figure 6 illustrates an embodiment of the present invention utilizing a community of distributed, collaborating electronic agents.

DETAILED DESCRIPTION OF THE INVENTION

1. System Architecture

a. Server-End Processing of Spoken Input

Figure 1a is an illustration of a data navigation system driven by spoken natural language input, in accordance with one embodiment of the present invention. As shown, a user's voice input data is captured by a voice input device 102, such as a microphone. Preferably voice input device 102 includes a button or the like that can be pressed or held-down to activate a listening mode, so that the system need not continually pay attention to, or be confused by, irrelevant background noise. In one preferred embodiment well-suited for the home entertainment setting, voice input device 102 is a portable remote control device with an integrated microphone, and the voice data is transmitted from device 102 preferably via infrared (or other wireless) link to communications box 104 (e.g., a set-top box or a similar communications device that is capable of retransmitting the raw voice data and/or processing the voice data) local to the user's environment and coupled to communications network 106. The voice data is then transmitted across network 106 to a remote server or servers 108. The voice data may preferably be transmitted in compressed digitized form, or alternatively --particularly where bandwidth constraints are significant-- in analog format (e.g., via frequency modulated transmission), in the latter case being digitized upon arrival at remote server 108.

At remote server 108, the voice data is processed by request processing logic 300 in order to understand the user's request and construct an appropriate query or request for navigation of remote data source 110, in accordance with the interpretation process exemplified in Figure 4 and Figure 5 and discussed in greater detail below. For purposes of executing this process, request processing logic 300 comprises functional modules including speech recognition engine 310, natural language (NL) parser 320, query construction logic 330, and query refinement logic 340, as shown in Figure 3. Data source 110 may comprise database(s), Internet/web site(s), or other electronic information repositories, and preferably resides on a central server or servers -- which may or may not be the same as server 108, depending on the storage and bandwidth needs of the application and the resources available to the practitioner. Data source 110 may include multimedia content, such as movies or other digital video and audio content, other various forms of entertainment data, or other electronic information. The contents of data source 110 are navigated -- i.e., the contents are accessed and searched, for retrieval of the particular information desired by the user -- using the processes of Figures 4 and 5 as described in greater detail below.

Once the desired information has been retrieved from data source 110, it is electronically transmitted via network 106 to the user for viewing on client display device 112. In a preferred embodiment well-suited for the home entertainment setting, display device 112 is a television monitor or similar audiovisual entertainment device, typically in stationary position for comfortable viewing by users. In addition, in such preferred embodiment, display device 112 is coupled to or integrated with a communications box (which is preferably the same as communications box 104, but may also be a separate unit) for receiving and decoding/formatting the desired electronic information that is received across communications network 106.

Network 106 is a two-way electronic communications network and may be embodied in electronic communication infrastructure including coaxial (cable television) lines, DSL, fiber-optic cable, traditional copper wire (twisted pair), or any other type of hardwired connection. Network 106 may also include a wireless connection such as a satellite-based connection, cellular connection, or other type of wireless connection. Network 106 may be part of the Internet and may support TCP/IP communications, or may be embodied in a proprietary network, or in any other electronic communications network infrastructure, whether packet-switched or connection-oriented. A design consideration is that network 106 preferably provide suitable bandwidth depending upon the nature of the content anticipated for the desired application.

b. Client-End Processing of Spoken Input

Figure 1b is an illustration of a data navigation system driven by spoken natural language input, in accordance with a second embodiment of the present invention. Again, a user's voice input data is captured by a voice input device 102, such as a microphone. In the embodiment shown in Figure 1b, the voice data is transmitted from device 202 to requests processing logic 300, hosted on a local speech processor, for processing and interpretation. In the preferred embodiment illustrated in Figure 1b, the local speech processor is conveniently integrated as part of communications box 104, although implementation in a physically separate (but communicatively coupled) unit is also possible as will be readily apparent to those of skill in the art. The voice data is processed by the components of request processing logic 300 in order to understand the user's request and construct an appropriate query or request for navigation of remote data source 110, in accordance with the interpretation process exemplified in Figures 4 and 5 as discussed in greater detail below.

The resulting navigational query is then transmitted electronically across network 106 to data source 110, which preferably resides on a central server or servers 108. As in Figure 1a, data source 110 may comprise database(s), Internet/web site(s), or other electronic information repositories, and preferably may include multimedia content, such as movies or other digital video and audio content, other various forms of entertainment data, or other electronic information. The contents of data source 110 are then navigated -- i.e., the contents are accessed and searched, for retrieval of the particular information desired by the user -- preferably using the process of Figures 4 and 5 as described in greater detail below. Once the desired information has been retrieved from data source 110, it is electronically transmitted via network 106 to the user for viewing on client display device 112.

In one embodiment in accordance with Figure 1b and well-suited for the home entertainment setting, voice input device 102 is a portable remote control device with an integrated microphone, and the voice data is transmitted from device 102 preferably via infrared (or other wireless) link to the local speech processor. The local speech processor is coupled to communications network 106, and also preferably to client display device 112 (especially for purposes of query refinement transmissions, as discussed below in connection with Figure 4, step 412), and preferably may be integrated within or coupled to communications box 104. In addition, especially for purposes of a home entertainment application, display device 112 is preferably a television monitor or similar audiovisual entertainment device, typically in stationary position for comfortable viewing by users. In addition, in such preferred embodiment, display device 112 is coupled to a communications box (which is preferably the same as communications box 104, but may also be a physically separate unit) for receiving and decoding/formatting the desired electronic information that is received across communications network 106.

Design considerations favoring server-side processing and interpretation of spoken input requests, as exemplified in Figure 1a, include minimizing the need to distribute costly computational hardware and software to all client users in order to perform speech and language processing. Design considerations favoring client-side processing, as exemplified in Figure 1b, include minimizing the quantity of data sent upstream across the network from each client, as the speech recognition is performed before transmission across the network and only the query data and/or request needs to be sent, thus reducing the upstream bandwidth requirements.

c. Mobile Client Embodiment

A mobile computing embodiment of the present invention may be implemented by practitioners as a variation on the embodiments of either Figure 1a or Figure 1b. For example, as depicted in Figure 2, a mobile variation in accordance with the server-side processing architecture illustrated in Figure 1a may be implemented by replacing voice input device 102, communications box 104, and client display device 112, with an integrated, mobile, information appliance 202 such as a cellular telephone or wireless personal digital assistant (wireless PDA). Mobile information appliance 202 essentially performs the functions of the replaced components. Thus, mobile information appliance 202 receives spoken natural language input requests from the user in the form of voice data, and transmits that data (preferably via wireless data receiving station 204) across communications network 206 for server-side interpretation of the request, in similar fashion as described above in connection with Figure 1. Navigation of data source 210 and retrieval of desired information likewise proceeds in an analogous manner as described above. Display information transmitted electronically back to the user across network 206 is displayed for the user on the display of information appliance 202, and audio information is output through the appliance's speakers.

Practitioners will further appreciate, in light of the above teachings, that if mobile information appliance 202 is equipped with sufficient computational processing power, then a mobile variation of the client-side architecture exemplified in Figure 2 may similarly be implemented. In that case, the modules corresponding to request processing logic 300 would be embodied locally in the computational resources of mobile information appliance 202, and the logical flow of data would otherwise follow in a manner analogous to that previously described in connection with Figure 1b.

As illustrated in Figure 2, multiple users, each having their own client input device, may issue requests, simultaneously or otherwise, for navigation of data source 210. This is equally true (though not explicitly drawn) for the embodiments depicted in Figures 1a and 1b. Data source 210 (or 100), being a network accessible information resource, has typically already been constructed to support access requests from simultaneous multiple network users, as known by practitioners of ordinary skill in the art. In the case of server-side speech processing, as exemplified in Figures 1a and 2, the interpretation logic and error correction logic modules are also preferably designed and implemented to support queuing and multi-tasking of requests from multiple simultaneous network users, as will be appreciated by those of skill in the art.

It will be apparent to those skilled in the art that additional implementations, permutations and combinations of the embodiments set forth in Figures 1a, 1b, and 2 may be created without straying from the scope and spirit of the present invention. For example, practitioners will understand, in light of the above teachings and design considerations, that it is possible to divide and allocate the functional components of request processing logic 300 between client and server. For example, speech recognition -- in entirety, or perhaps just early stages such as feature extraction -- might be performed locally on the client end, perhaps to reduce bandwidth requirements, while natural language parsing and other necessary processing might be performed upstream on the server end, so that more extensive computational power need not be distributed locally to each client. In that case, corresponding portions of request processing logic 300, such as speech recognition engine 310 or portions thereof, would reside locally at the client as in Figure 1b, while other component modules would be hosted at the server end as in Figures 1a and 2.

Further, practitioners may choose to implement the each of the various embodiments described above on any number of different hardware and software computing platforms and environments and various combinations thereof, including, by way of just a few examples: a general-purpose hardware microprocessor such as the Intel Pentium series; operating system software such as Microsoft Windows/CE, Palm OS, or Apple Mac OS (particularly for client devices and client-side processing), or Unix, Linux, or Windows/NT (the latter three particularly for network data servers and server-side processing), and/or proprietary information access platforms such as Microsoft's WebTV or the Diva Systems video-on-demand system.

2. Processing Methodology

The present invention provides a spoken natural language interface for interrogation of remote electronic databases and retrieval of desired information. A preferred embodiment of the present invention utilizes the basic methodology outlined in the flow diagram of Figure 4 in order to provide this interface. This methodology will now be discussed.

a. Interpreting Spoken Natural Language Requests

At step 402, the user's spoken request for information is initially received in the form of raw (acoustic) voice data by a suitable input device, as previously discussed in connection with Figures 1-2. At step 404 the voice data received from the user is interpreted in order to understand the user's request for information. Preferably this step includes performing speech recognition in order to extract words from the voice data, and further includes natural language parsing of those words in order to generate a structured linguistic representation of the user's request.

Speech recognition in step 404 is performed using speech recognition engine 310. A variety of commercial quality, speech recognition engines are readily available on the market, as practitioners will know. For example, Nuance Communications offers a suite of speech recognition engines, including Nuance 6, its current flagship product, and Nuance Express, a lower cost package for entry-level applications. As one other example, IBM offers the ViaVoice speech recognition engine, including a low-cost shrink-wrapped version available through popular consumer distribution channels. Basically, a speech recognition engine processes acoustic voice data and attempts to generate a text stream of recognized words.

Typically, the speech recognition engine is provided with a vocabulary lexicon of likely words or phrases that the recognition engine can match against its analysis of acoustical signals, for purposes of a given application. Preferably, the lexicon is dynamically adjusted to reflect the current user context, as established by the preceding user inputs. For example, if a user is engaged in a dialogue with the system about movie selection, the recognition engine's vocabulary may preferably be adjusted to favor relevant words and phrases, such as a stored list of proper names for popular movie actors and directors, etc. Whereas if the current dialogue involves selection and viewing of a sports event, the engine's vocabulary might preferably be adjusted to favor a stored list of proper names for professional sports teams, etc. In addition, a speech recognition engine is provided with language models that help the engine predict the most likely interpretation of a given segment of acoustical voice data, in the current context of phonemes or words in which the segment appears. In addition, speech recognition engines often echo to the user, in more or less real-time, a transcription of the engine's best guess at what the user has said, giving the user an opportunity to confirm or reject.

In a further aspect of step 404, natural language interpreter (or parser) 320 linguistically parses and interprets the textual output of the speech recognition engine. In a preferred embodiment of the present invention, the natural-language interpreter attempts to determine both the meaning of spoken words (semantic processing) as well as the grammar of the statement (syntactic processing), such as the Gemini Natural Language Understanding System developed by SRI International. The Gemini system is described in detail in publications entitled "Gemini: A Natural Language System for Spoken-Language Understanding" and "Interleaving Syntax and Semantics in an Efficient Bottom-Up Parser," both of which are currently available online at http://www.ai.sri.com/natural-language/projects/arpa-sls/nat-lang.html. (Copies of those publications are also included in an information disclosure statement submitted herewith, and are incorporated herein by this reference). Briefly, Gemini applies a set of syntactic and semantic grammar rules to a word string using a bottom-up parser to generate a logical form, which is a structured representation of the context-independent meaning of the string. Gemini can be used with a variety of grammars, including general English grammar as well as application-specific grammars. The Gemini parser is based on "unification grammar," meaning that grammatical categories incorporate features that can be assigned values; so that when grammatical category expressions are matched in the course of parsing or semantic interpretation, the information contained in the features is combined, and if the feature values are incompatible the match fails.

It is possible for some applications to achieve a significant reduction in speech recognition error by using the natural-language processing system to re-score recognition hypotheses. For example, the grammars defined for a language parser like Gemini may be compiled into context-free grammar that, in turn, can be used directly as language models for speech recognition engines like the Nuance recognizer. Further details on this methodology are provided in the publication "Combining Linguistic and Statistical Knowledge Sources in Natural-Language Processing for ATIS" which is currently available online through http://www.ai.sri.com/natural-language/projects/arpa-sls/spnl-int.html. A copy of this publication is included in an information disclosure submitted herewith, and is incorporated herein by this reference.

In an embodiment of the present invention that may be preferable for some applications, the natural language interpreter "learns" from the past usage patterns of a particular user or of groups of users. In such an embodiment, the successfully interpreted requests of users are stored, and can then be used to enhance accuracy by comparing a current request to the stored requests, thereby allowing selection of a most probable result.

b. Constructing Navigation Queries

In step 405 request processing logic 300 identifies and selects an appropriate online data source where the desired information (in this case, current weather reports for a given city) can be found. Such selection may involve look-up in a locally stored table, or possibly dynamic searching through an online search engine, or other online search techniques. For some applications, an embodiment of the present invention may be implemented in which only access to a particular data source (such as a particular vendor's proprietary content database) is supported; in that case, step 405 may be trivial or may be eliminated entirely.

Step 406 attempts to construct a navigation query, reflecting the interpretation of step 404. This operation is preferably performed by query construction logic 330.

A "navigation query" means an electronic query, form, series of menu selections, or the like; being structured appropriately so as to navigate a particular data source of interest in search of desired information. In other words, a navigation query is constructed such that it includes whatever content and structure is required in order to access desired information electronically from a particular database or data source of interest.

For example, for many existing electronic databases, a navigation query can be embodied using a formal database query language such as Standard Query Language (SQL). For many databases, a navigation query can be constructed through a more user-friendly interactive front-end, such as a series of menus and/or interactive forms to be selected or filled in. SQL is a standard interactive and programming language for getting information from and updating a database. SQL is both an ANSI and an ISO standard. As is well known to practitioners, a Relational Database Management System (RDBMS), such as Microsoft's Access, Oracle's Oracle7, and Computer Associates' CA-OpenIngres, allow programmers to create, update, and administer a relational database. Practitioners of ordinary skill in the art will be thoroughly familiar with the notion of database navigation through structured query, and will be readily able to appreciate and utilize the existing data structures and navigational mechanisms for a given database, or to create such structures and mechanisms where desired.

In accordance with the present invention, the query constructed in step 406 must reflect the user's request as interpreted by the speech recognition engine and the NL parser in step 404. In embodiments of the present invention wherein data source 110 (or 210 in the corresponding embodiment of Figure 2) is a structured relational database or the like, step 406 of the present invention may entail constructing an appropriate Structured Query Language (SQL) query or the like, or automatically filling out a front-end query form, series of menus or the like, as described above.

In many existing Internet (and Intranet) applications, an online electronic data source is accessible to users only through the medium of interaction with a so-called Common Gateway Interface (CGI) script. Typically the user who visits a web site of this nature must fill in the fields of an online interactive form. The online form is in turn linked to a CGI script, which transparently handles actual navigation of the associated data source and produces output for viewing by the user's web browser. In other words, direct user access to the data source is not supported, only mediated access through the form and CGI script is offered.

For applications of this nature, an advantageous embodiment of the present invention "scrapes" the scripted online site where information desired by a user may be found in order to facilitate construction of an effective navigation query. For example, suppose that a user's spoken natural language request is: "What's the weather in Miami?" After this request is received at step 402 and interpreted at step 404, assume that step 405 determines that the desired weather information is available online through the medium of a CGI-scripted interactive form. Step 406 is then preferably carried out using the expanded process diagrammed in Figure 5. In particular, at sub-step 520, query construction logic 330 electronically "scrapes" the online interactive form, meaning that query construction logic 330 automatically extracts the format and structure of input fields accepted by the online form. At sub-step 522, a navigation query is then constructed by instantiating (filling in) the extracted input format -- essentially an electronic template -- in a manner reflecting the user's request for information as interpreted in step 404. The flow of control then returns to step 407 of Figure 4. Ultimately, when the query thus constructed by scraping is used to navigate the online data source in step 408, the query effectively initiates the same scripted response as if a human user had visited the online site and had typed appropriate entries into the input fields of the online form.

In the embodiment just described, scraping step 520 is preferably carried out with the assistance of an online extraction utility such as WebL. WebL is a scripting language for automating tasks on the World Wide Web. It is an imperative, interpreted language that has built-in support for common web protocols like HTTP and FTP, and popular data types like HTML and XML. WebL's implementation language is Java, and the complete source code is available from Compaq. In addition, step 520 is preferably performed dynamically when necessary -- in other words, on-the-fly in response to a particular user query -- but in some applications it may be possible to scrape relatively stable (unchanging) web sites of likely interest in advance and to cache the resulting template information.

It will be apparent, in light of the above teachings, that preferred embodiments of the present invention can provide a spoken natural language interface atop an existing, non-voice data navigation system, whereby users can interact by means of intuitive natural language input not strictly conforming to the linear browsing architecture or other artifacts of an existing menu/text/click navigation system. For example, users of an appropriate embodiment of the present invention for a video-on-demand application can directly speak the natural request: "Show me the movie 'Unforgiven'" -- instead of walking step-by-step through a typically linear sequence of genre/title/actor/director menus, scrolling and selecting from potentially long lists on each menu, or instead of being forced to use an alphanumeric keyboard that cannot be as comfortable to hold or use as a lightweight remote control. Similarly, users of an appropriate embodiment of the present invention for a web-surfing application in accordance with the process shown in Figure 5 can directly speak the natural request: "Show me a one-month price chart for Microsoft stock" -- instead of potentially having to navigate to an appropriate web site, search for the right ticker symbol, enter/select the symbol, and specify display of the desired one-month price chart, each of those steps potentially involving manual navigation and data entry to one or more different interaction screens. (Note that these examples are offered to illustrate some of the potential benefits offered by appropriate embodiments of the present invention, and not to limit the scope of the invention in any respect.)

c. Error Correction

Several problems can arise when attempting to perform searches based on spoken natural language input. As indicated at decision step 407 in the process of Figure 4, certain deficiencies may be identified during the process of query construction, before search of the data source is even attempted. For example, the user's request may fail to specify enough information in order to construct a navigation query that is specific enough to obtain a satisfactory search result. For example, a user might orally request "what's the weather?" whereas the national online data source identified in step 405 and scraped in step 520 might require specifying a particular city.

Additionally, certain deficiencies and problems may arise following the navigational search of the data source at step 408, as indicated at decision step 409 in Figure 4. For example, with reference to a video-on-demand application, a user may wish to see the movie "Unforgiven", but perhaps the user can't recall name of the film, but knows it was directed by and starred actor Clint Eastwood. A typical video-on-demand database might indeed be expected to allow queries specifying the name of a leading actor and/or director, but in the case of this query -- as in many cases -- that will not be enough to narrow the search to a single film, and additional user input in some form is required.

In the event that one or more deficiencies in the user's spoken request, as processed, result in the problems described, either at step 407 or 409, some form of error handling is in order. A straightforward, crude technique might be for the system to respond simply *"input not understood / insufficient; please try again."* However, that approach will likely result in frustrated users, and is not optimal or even acceptable for most applications. Instead, a preferred technique in accordance with the present invention handles such errors and deficiencies in user input at step 412, whether detected at step 407 or step 409, by soliciting additional input from the user in a manner taking advantage of the partial construction already performed and via user interface modalities in addition to spoken natural language ("multi-modality"). This supplemental interaction is preferably conducted through client display device 112 (202, in the embodiment of Figure 2), and may include textual, graphical, audio and/or video media. Further details and examples are provided below. Query refinement logic 340 preferably carries out step 412. The additional input received from the user is fed into and augments interpreting step 404, and query construction step 406 is likewise repeated with the benefit of the augmented interpretation. These operations, and subsequent navigation step 408, are preferably repeated until no remaining problems or deficiencies are identified at decision points 407 or 409. Further details and examples for this query refinement process are provided immediately below.

Consider again the example in which the user of a video-on-demand application wishes to see "Unforgiven" but can only recall that it was directed by and starred Clint Eastwood. First, it bears noting that using a prior art navigational interface, such as a conventional menu interface, will likely be relatively tedious in this case. The user can proceed through a sequence of menus, such as Genre (select "western"), Title (skip), Actor ("Clint Eastwood"), and Director ("Clint Eastwood"). In each case --especially for the last two items -- the user would typically scroll and select from fairly long lists in order to enter his or her desired name, or perhaps use a relatively couch-unfriendly keypad to manually type the actor's name twice.

Using a preferred embodiment of the present invention, the user instead speaks aloud, holding remote control microphone 102, "I want to see that movie starring and directed by Clint Eastwood. Can't remember the title." At step 402 the voice data is received. At step 404 the voice data is interpreted. At step 405 an appropriate online data source is selected (or perhaps the system is directly connected to a proprietary video-on-demand provider). At step 406 a query is automatically constructed by the query construction logic 330 specifying "Clint Eastwood" in both the actor and director fields. Step 407 detects no obvious problems, and so the query is electronically submitted and the data source is navigated at step 408, yielding a list of several records satisfying the query (e.g., "Unforgiven", "True Crime", "Absolute Power", etc.). Step 409 detects that additional user input is needed to further refine the query in order to select a particular film for viewing.

At that point, in step 412 query refinement logic 340 might preferably generate a display for client display device 112 showing the (relatively short) list of film titles that satisfy the user's stated constraints. The user can then preferably use a relatively convenient input modality, such as buttons on the remote control, to select the desired title from the menu. In a further preferred embodiment, the first title on the list is highlighted by default, so that the user can simply press an "OK" button to choose that selection. In a further preferred feature, the user can mix input modalities by speaking a response like "I want number one on the list." Alternatively, the user can preferably say, "Let's see Unforgiven," having now been reminded of the title by the menu display.

Utilizing the user's supplemental input, request processing logic 300 iterates again through steps 404 and 406, this time constructing a fully-specified query that specifically requests the Eastwood film "Unforgiven." Step 408 navigates the data source using that query and retrieves the desired film, which is then electronically transmitted in step 410 from network server 108 to client display device 112 via communications network 106.

Now consider again the example in which the user of a web surfing application wants to know his or her local weather, and simply asks, "what's the weather?" At step 402 the voice data is received. At step 404 the voice data is interpreted. At step 405 an online web site providing current weather information for major cities around the world is selected. At step 406 and sub-step 520, the online site is scraped using a WebL-style tool to extract an input template for interacting with the site. At sub-step 522, query construction logic 330 attempts to construct a navigation query by instantiating the input template, but determines (quite rightly) that a required field -- name of city -- cannot be determined from the user's spoken request as interpreted in step 404. Step 407 detects this deficiency, and in step 412 query refinement logic 340 preferably generates output for client display device 112 soliciting the necessary supplemental input. In a preferred embodiment, the output might display the name of the city where the user is located highlighted by default. The user can then simply press an "OK" button -- or perhaps mix modalities by saying "yes, exactly" -- to choose that selection. A preferred embodiment would further display an alphabetical scrollable menu listing other major cities, and/or invite the user to speak or select the name of the desired city.

Here again, utilizing the user's supplemental input, request processing logic 300 iterates through steps 404 and 406. This time, in performing sub-step 520, a cached version of the input template already scraped in the previous iteration might preferably be retrieved. In sub-step 522, query construction logic 330 succeeds this time in instantiating the input template and constructing an effective query, since the desired city has now been clarified. Step 408 navigates the data source using that query and retrieves the desired weather information, which is then electronically transmitted in step 410 from network server 108 to client display device 112 via communications network 106.

It is worth noting that in some instances, there may be details that are not explicitly provided by the user, but that query construction logic 330 or query refinement logic 340 may preferably deduce on their own through reasonable assumptions, rather than requiring the use to provide explicit clarification. For example, in the example previously described regarding a request for a weather report, in some applications it might be preferable for the system to simply assume that the user means a weather report for his or her home area and to retrieve that information, if the cost of doing so is not significantly greater than the cost of asking the user to clarify the query. Making such an assumption might be even more strongly justified in a preferred embodiment, as described earlier, where user histories are tracked, and where such history indicates that a particular user or group of users typically expect local information when asking for a weather forecast. At any rate, in the event such an assumption is made, if the user actually intended to request the weather for a different city, the user would then need to ask his or her question again. It will be apparent to practitioners, in light of the above teachings, that the choice of whether to program query construction logic 330 and query refinement logic 340 to make make particular assumptions will typically involve trade-offs involving user conveience that can be assessed in the context of specific applications.

3. Open Agent Architecture (OAA®)

Open Agent Architecture™ (OAA®) is a software platform, developed by the assignee of the present invention, that enables effective, dynamic collaboration among communities of distributed electronic agents. OAA is described in greater detail in co-pending U.S. Patent Application No. 09/225,198, which has been incorporated herein by reference. Very briefly, the functionality of each client agent is made available to the agent community through registration of the client agent's capabilities with a facilitator. A software "wrapper" essentially surrounds the underlying application program performing the services offered by each client. The common infrastructure for constructing agents is preferably supplied by an *agent library*. The agent library is preferably accessible in the runtime environment of several different programming languages. The agent library preferably minimizes the effort required to construct a new system and maximizes the ease with which legacy systems can be "wrapped" and made compatible with the agent-based architecture of the present invention. When invoked, a client agent makes a connection to a facilitator, which is known as its *parent facilitator*. Upon connection, an agent registers with its parent facilitator a specification of the capabilities and services it can provide, using a high-level, declarative Interagent Communication Language (*"ICL"*) to express those capabilities. Tasks are presented to the facilitator in the form of ICL goal expressions. When a facilitator determines that the registered capabilities of one of its client agents will help satisfy a current goal or sub-goal thereof, the facilitator delegates that sub-goal to the client agent in the form of an ICL request. The client agent processes the request and returns answers or information to the facilitator. In processing a request, the client agent can use *ICL* to request services of other agents, or utilize other infrastructure services for collaborative work. The facilitator coordinates and integrates the results received from different client agents on various sub-goals, in order to satisfy the overall goal.

OAA provides a useful software platform for building systems that integrate spoken natural language as well as other user input modalities. For example, see the above-referenced co-pending patent application, especially Figure 13 and the corresponding discussion of a "multi-modal maps" application, and Figure 12 and the corresponding discussion of a "unified messaging" application. Another example is the InfoWiz interactive information kiosk developed by the assignee and described in the document entitled "InfoWiz: An Animated Voice Interactive Information System" available online at http://www.ai.sri.com/~oaa/applications.html. A copy of the InfoWhiz document is provided in an Information Disclosure Statement submitted herewith and incorporated herein by this reference. A further example is the "CommandTalk" application developed by the assignee for the U.S. military, as described online at http://www.ai.sri.com/~lesaf/commandtalk.html and in the following publications, copies of which are provided in an Information Disclosure Statement submitted herewith and incorporated herein by this reference:

- "CommandTalk: A Spoken-Language Interface for Battlefield Simulations", 1997, by Robert Moore, John Dowding, Harry Bratt, J. Mark Gawron, Yonael Gorfu and Adam Cheyer, in "Proceedings of the Fifth Conference on Applied Natural Language Processing", Washington, DC, pp. 1-7, Association for Computational Linguistics

- "The CommandTalk Spoken Dialogue System", 1999, by Amanda Stent, John Dowding, Jean Mark Gawron, Elizabeth Owen Bratt and Robert Moore, in "Proceedings of the Thirty-Seventh Annual Meeting of the ACL", pp. 183-190, University of Maryland, College Park, MD, Association for Computational Linguistics

- "Interpreting Language in Context in CommandTalk", 1999, by John Dowding and Elizabeth Owen Bratt and Sharon Goldwater, in "Communicative Agents: The Use of Natural Language in Embodied Systems", pp. 63-67, Association for Computing Machinery (ACM) Special Interest Group on Artificial Intelligence (SIGART), Seattle, WA

For some applications and systems, OAA can provide an advantageous platform for constructing embodiments of the present invention. For example, a representative application is now briefly presented, with reference to Figure 6. If the statement "show me movies starring John Wayne" is spoken into the voice input device, the voice data for this request will be sent by UI agent 650 to facilitator 600, which in turn will ask natural language (NL) agent 620 and speech recognition agent 610 to interpret the query and return the interpretation in *ICL* format. The resulting *ICL* goal expression is then routed by the facilitator to appropriate agents -- in this case, video-on-demand database agent 640 -- to execute the request. Video database agent 640 preferably includes or is coupled to an appropriate embodiment of query construction logic 330 and query refinement logic 340, and may also issue ICL requests to facilitator 600 for additional assistance -- e.g., display of menus and capture of additional user input in the event that query refinement is needed -- and facilitator 600 will delegate such requests to appropriate client agents in the community. When the desired video content is ultimately retrieved by video database agent 640, UI agent 650 is invoked by facilitator 600 to display the movie.

Other spoken user requests, such as a request for the current weather in New York City or for a stock quote, would eventually lead facilitator to invoke web database agent 630 to access the desired information from an appropriate Internet site. Here again, web database agent 630 preferably includes or is coupled to an appropriate embodiment of query construction logic 330 and query refinement logic 340, including a scraping utility such as WebL. Other spoken requests, such as a request to view recent emails or access voice mail, would lead the facilitator to invoke the appropriate email agent 660 and/or telephone agent 680. A request to record a televised program of interest might lead facilitator 600 to invoke web database agent 630 to return televised program schedule information, and then invoke VCR controller agent 680 to program the associated VCR unit to record the desired television program at the scheduled time.

Control and connectivity embracing additional electronic home appliances (e.g., microwave oven, home surveillance system, etc.) can be integrated in comparable fashion. Indeed, an advantage of OAA-based embodiments of the present invention, that will be apparent to practitioners in light of the above teachings and in light of the teachings disclosed in the cited co-pending patent applications, is the relative ease and flexibility with which additional service agents can be plugged into the existing platform, immediately enabling the facilitator to respond dynamically to spoken natural language requests for the corresponding services.

4. Further Embodiments and Equivalents

While the present invention has been described in terms of several preferred embodiments, there are many alterations, permutations, and equivalents that may fall within the scope of this invention. It should also be noted that there are many alternative ways of implementing the methods and apparatuses of the present invention. It is therefore intended that the following appended claims be interpreted as including all such alterations, permutations, and equivalents as fall within the true spirit and scope of the present invention.

CLAIMS

What is claimed is:

1. A method for utilizing spoken natural language for navigating an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising the steps of:

   (a) receiving a spoken natural language ("NL") request for desired information from the user;

   (b) rendering an interpretation of the spoken natural language request;

   (c) constructing at least part of a navigation query based upon the interpretation;

   (d) soliciting additional input from the user, including user interaction in a modality different than the original request;

   (e) refining the navigation query, based upon the additional input;

   (f) using the refined navigation query to select a portion of the electronic data source; and

   (g) transmitting the selected portion of the electronic data source from the network server to a client device of the user.

2. The method of claim 1, wherein the step of rendering an interpretation further includes deriving linguistic information by using a speech recognition engine and an NL parser.

3. The method of claim 1, wherein the step of constructing a navigation query further includes the steps of extracting an input template for an online scripted interface to the data source, and using the input template to construct the navigation query.

4. The method of claim 3, wherein the step of extracting an input template includes dynamically scraping the online scripted interface.

5. The method of claim 1, wherein the navigation query is constructed in the format of a database query language.

6. The method of claim 1, wherein the step of rendering an interpretation and the step of constructing a navigation query are performed, at least in part, on a computing device located locally with the user.

7. The method of claim 1, wherein the step of rendering an interpretation and the step of constructing a navigation query are performed, at least in part, on a network computing device located remotely from the user.

8. The method of claim 1, wherein the step of soliciting additional input is performed in response to one or more deficiencies encountered during the step of constructing a navigation query.

9. The method of claim 8, wherein the deficiencies include unresolved words of the spoken NL request.

10. The method of claim 8, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken NL request.

11. The method of claim 1, wherein the step of soliciting additional input is performed in response to one or more deficiencies encountered after a first navigation of the data source using the navigation query constructed in step (c).

12. The method of claim 11, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

13. The method of claim 11, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

14. The method of claim 1, wherein the input modality of step (d) includes selecting from a displayed option menu.

15. The method of claim 14, wherein the act of selecting from the displayed option menu is performed by speaking.

16. The method of claim 1, wherein the method is performed with respect to a plurality of simultaneous users and corresponding client devices.

17. The method of claim 1, further including the step of selecting the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken NL request.

18. The method of claim 1, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

19. A system for utilizing spoken natural language to navigate an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, the system comprising:

(a) a portable microphone operable to receive a spoken natural language ("NL") request for desired information from the user;

(b) spoken language processing logic, operable to render an interpretation of the spoken natural language request;

(c) query construction logic, operable to construct a navigation query in response to the interpretation of the spoken natural language request;

(d) user interaction logic, operable to solicit additional input from the user, including user interaction in a modality different than the original request;

(e) query refining logic, operable to refine the navigation query, based upon the additional input;

(f) navigation logic, operable to select a portion of the electronic data source using the navigation query; and

(g) electronic communications infrastructure for transmitting the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user.

20. The system of claim 19, wherein the spoken language processing logic includes speech recognition logic and an NL parsing logic for deriving linguistic information.

21. The system of claim 19, wherein the spoken language processing logic extracts an input template for an online scripted interface to the data source, and uses the input template to construct the navigation query.

22. The system of claim 21, wherein the spoken language processing logic dynamically scrapes the online scripted interface.

23. The system of claim 19, wherein the query construction logic constructs the query in the format of a database query language.

24. The system of claim 19, wherein at least a portion of the spoken language processing logic is hosted on a computing device located locally with the user, and wherein the portable microphone is electronically coupled to the local computing device.

25. The system of claim 19, wherein at least a portion of the spoken language processing logic is hosted on a network computing device located remotely from the user, and wherein the portable microphone sends data to the remote network computing device via the communications infrastructure.

26. The system of claim 19, wherein the user interaction logic solicits additional input in response to one or more deficiencies encountered during construction of the navigation query.

27. The system of claim 26, wherein the deficiencies include unresolved words of the spoken NL request.

28. The system of claim 26, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken NL request.

29. The system of claim 19, wherein the user interaction logic solicits additional input in response to one or more deficiencies encountered after a first navigation of the data source performed by the navigation logic.

30. The system of claim 29, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

31. The system of claim 29, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

32. The system of claim 19, wherein the user interaction logic displays an option menu.

33. The system of claim 32, wherein the act of selecting from the displayed option menu is performed by speaking.

34. The system of claim 19, wherein the navigation logic selects the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken NL request.

35. The system of claim 19, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

36. The system of claim 19, wherein the display device receives data from the electronicdata source on the network servers via a communications box.

37. The system of claim 19, wherein the electronic communication infrastructure is a two-way infrastructure and is selected from among one or more of the following group: {coaxial cable, DSL, satellite, wireless/cellular, fiber-optic}.

38. An computer program embodied on a computer readable medium for utilizing spoken natural language for navigating an electronic data source, the

electronic data source being located at one or more network servers located remotely from a user, comprising:

(a) a code segment that receives a spoken natural language ("NL") request for desired information from the user;

(b) a code segment that renders an interpretation of the spoken natural language request;

(c) a code segment that constructs at least part of a navigation query based upon the interpretation;

(d) a code segment that solicits additional input from the user, including user interaction in a modality different than the original request;

(e) a code segment that refines the navigation query, based upon the additional input;

(f) a code segment that uses the refined navigation query to select a portion of the electronic data source; and

(g) a code segment that transmits the selected portion of the electronic data source from the network server to a ~~primarily~~ stationary, display device located locally with the user.

39. The computer program of claim 38, further comprising a code segment that derives linguistic information by using a speech recognition engine and an NL parser.

40. The computer program of claim 38, further comprising a code segment that extract an input template for an online scripted interface to the data source, and a code segment that uses the input template to construct the navigation query.

41. The computer program of claim 40, further comprising a code segment that dynamically scrapes the online scripted interface.

42. The computer program of claim 38, wherein the navigation query is constructed in the format of a database query language.

43. The computer program of claim 38, wherein rendering of the interpretation and the construction of the navigation query are performed, at least in part, on a computing device located locally with the user.

44. The computer program of claim 38, wherein the rendering of the interpretation and the construction of a navigation query are performed, at least in part, on a network computing device located remotely from the user.

45. The computer program of claim 38, wherein code segment that solicits additional input solicits the additional input in response to one or more deficiencies encountered during the constructing of the navigation query.

46. The computer program of claim 45, wherein the deficiencies include unresolved words of the spoken NL request.

47. The computer program of claim 45, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken NL request.

48. The computer program of claim 38, wherein the code segment that solicits the additional input solicits the additional input in response to one or more deficiencies encountered after a first navigation of the data source.

49. The computer program of claim 48, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

50. The computer program of claim 48, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

51. The computer program of claim 38, wherein code segment that solicits additional input displays an option menu.

52. The computer program of claim 51, wherein the act of selecting from the displayed option menu is performed by speaking.

53. The computer program of claim 38, wherein the code segments of the computer program operate with respect to a plurality of simultaneous users and corresponding client devices.

54. The computer program of claim 38, further comprising a code segment that selects the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken NL request.

55. The computer program of claim 38, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

~~Add 17~~ ~~18~~

~~Add 15~~

Add 19

NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK

ABSTRACT OF THE INVENTION

Sub a1

A system, method, and article of manufacture are provided for navigating an electronic data source by means of spoken natural language. When a spoken natural language input request is received from a user, it is interpreted. Additional input is solicited from the user in a modality different than the original request and used to refine the navigation query. The resulting interpretation of the request is thereupon used to automatically construct an operational navigation query to retrieve the desired information from one or more electronic network data sources.

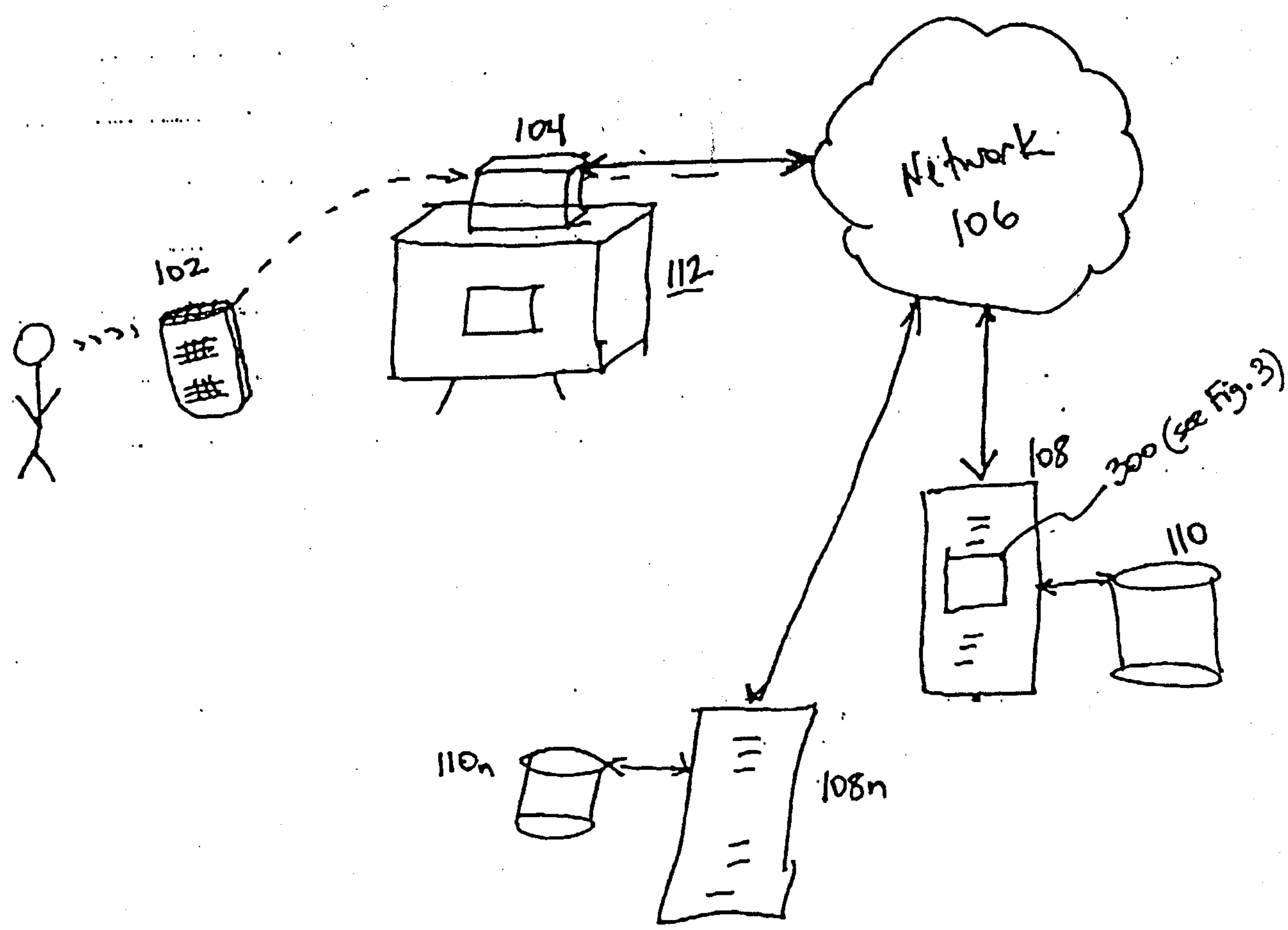


Fig. 1a

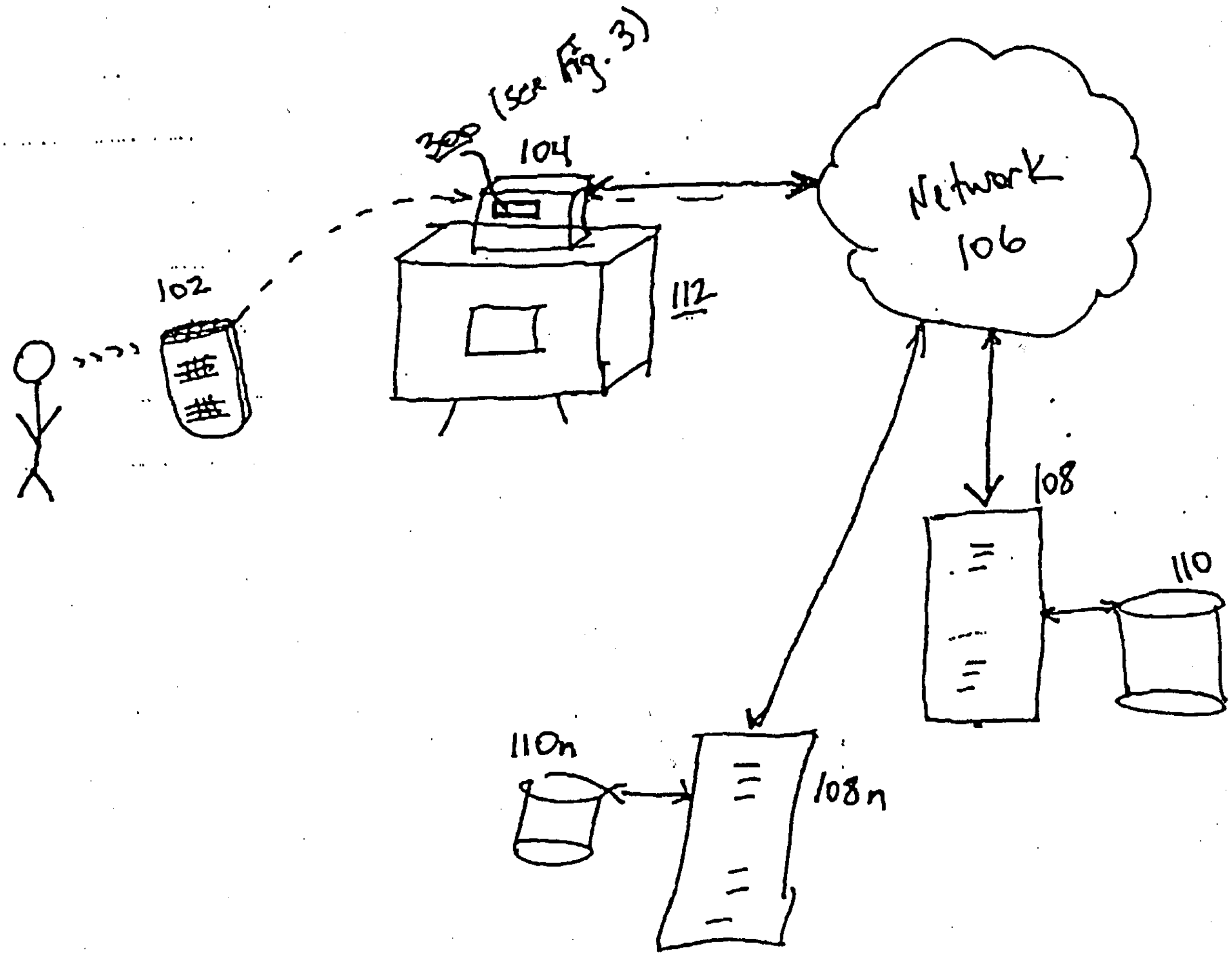


Fig. 1b

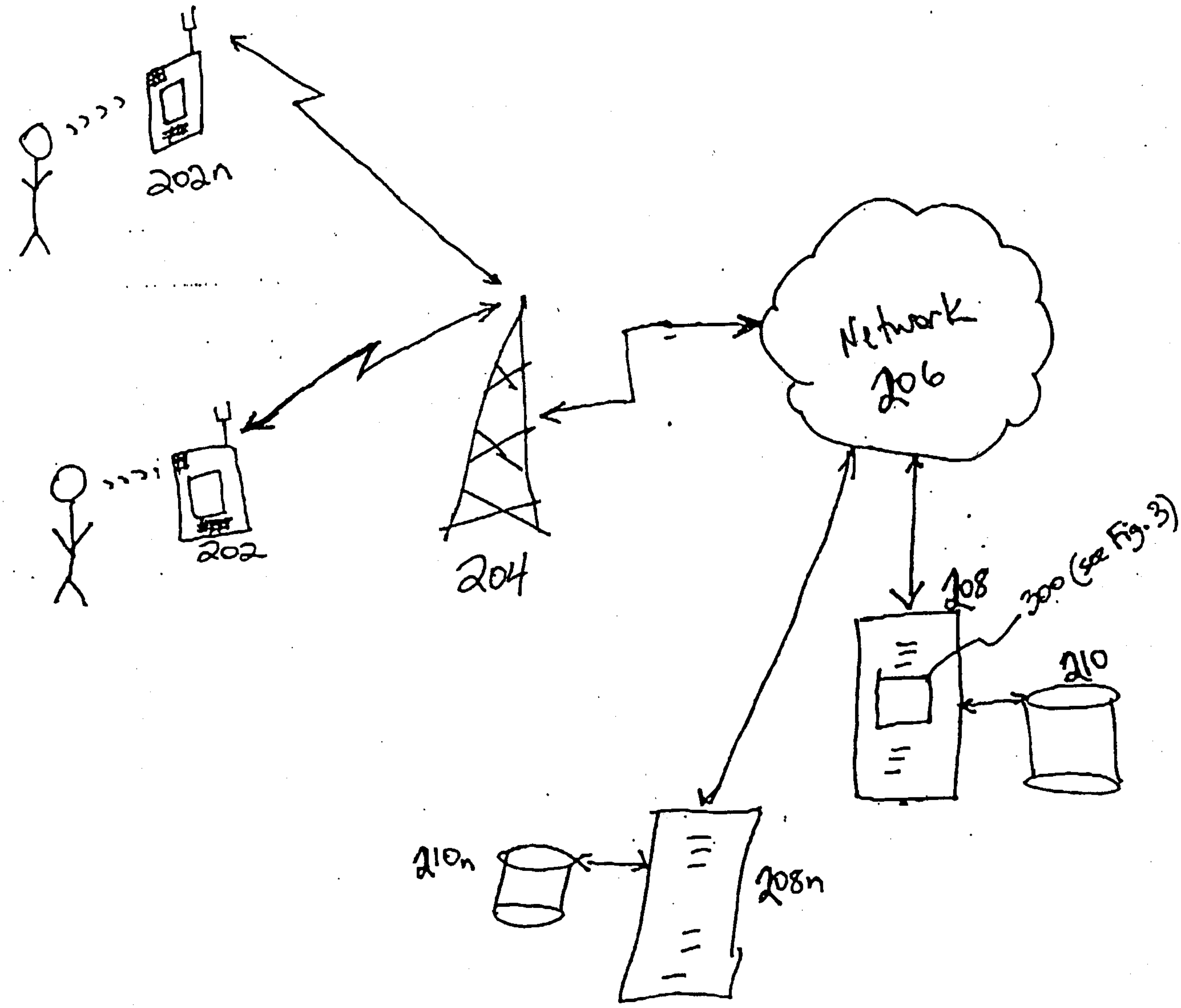


Fig. 2

Request Processing logic 300

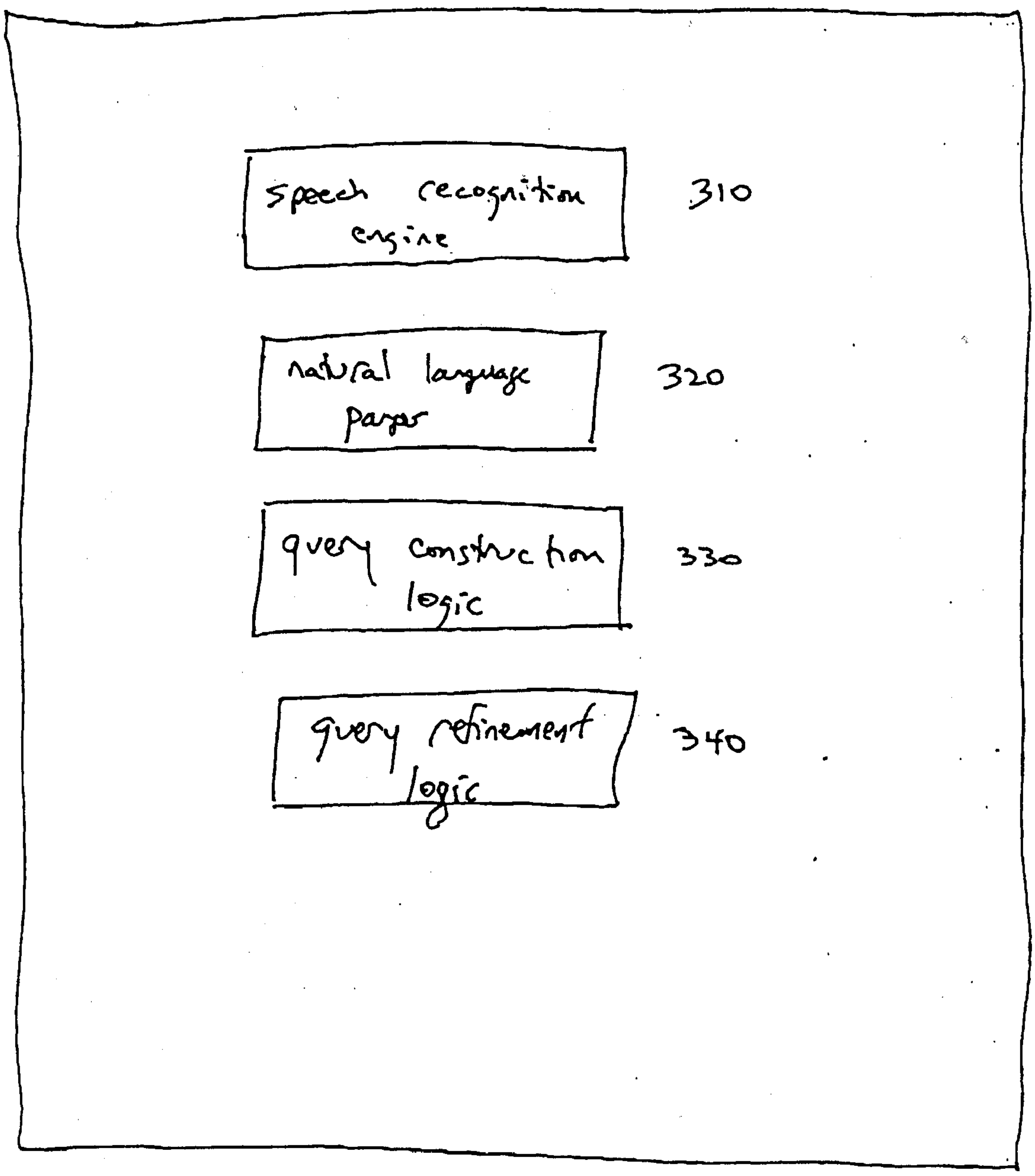
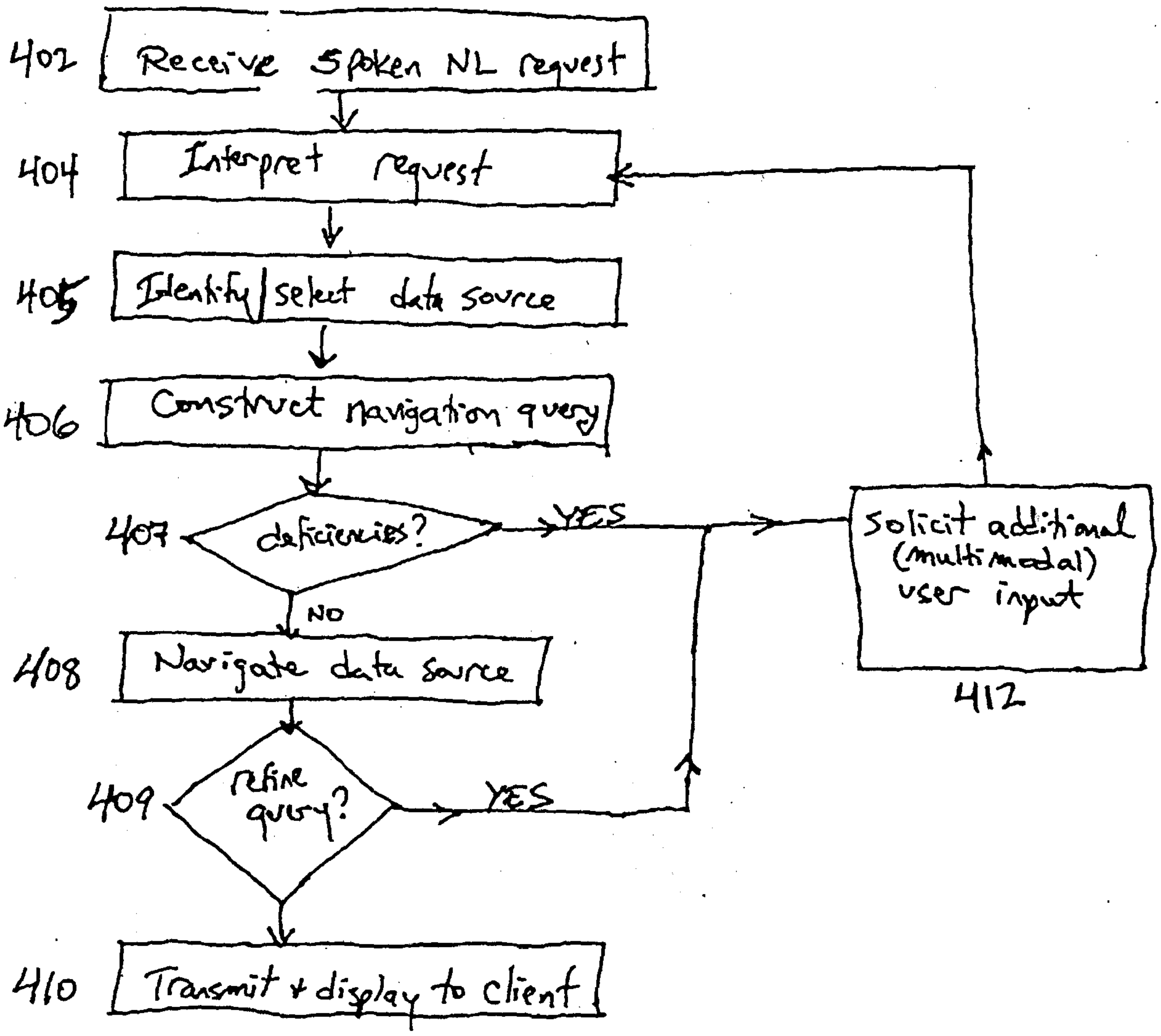


Fig. 3



402 Receive spoken NL request
404 Interpret request
405 Identify/select data source
406 Construct navigation query
407 deficiencies?
YES
NO
408 Navigate data source
409 refine query?
YES
410 Transmit + display to client
Solicit additional (multimodal) user input
412

Fig. 4

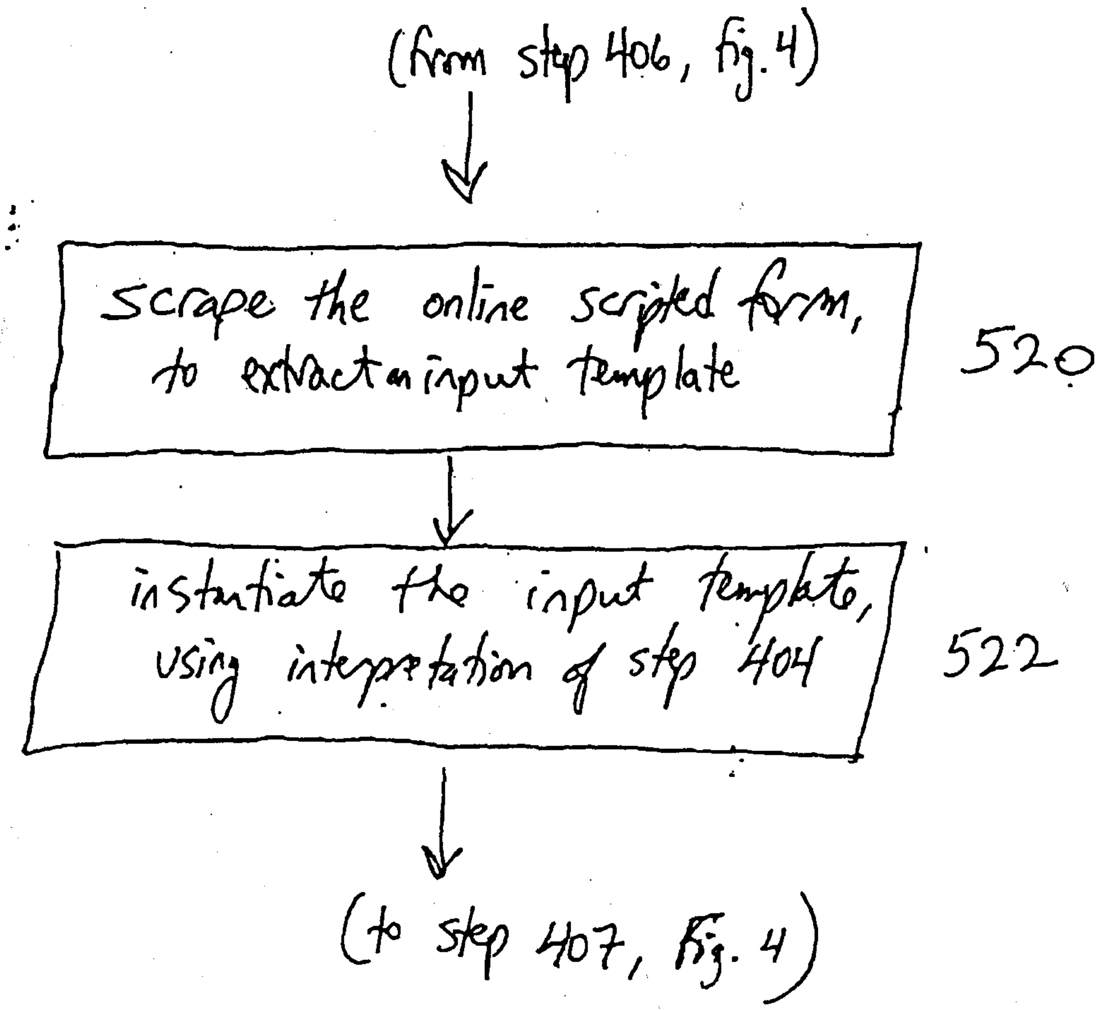

(from step 406, fig. 4)
scrape the online scripted form, to extract an input template
520
instantiate the input template, using interpretation of step 404
522
(to step 407, Fig. 4)

Fig. 5

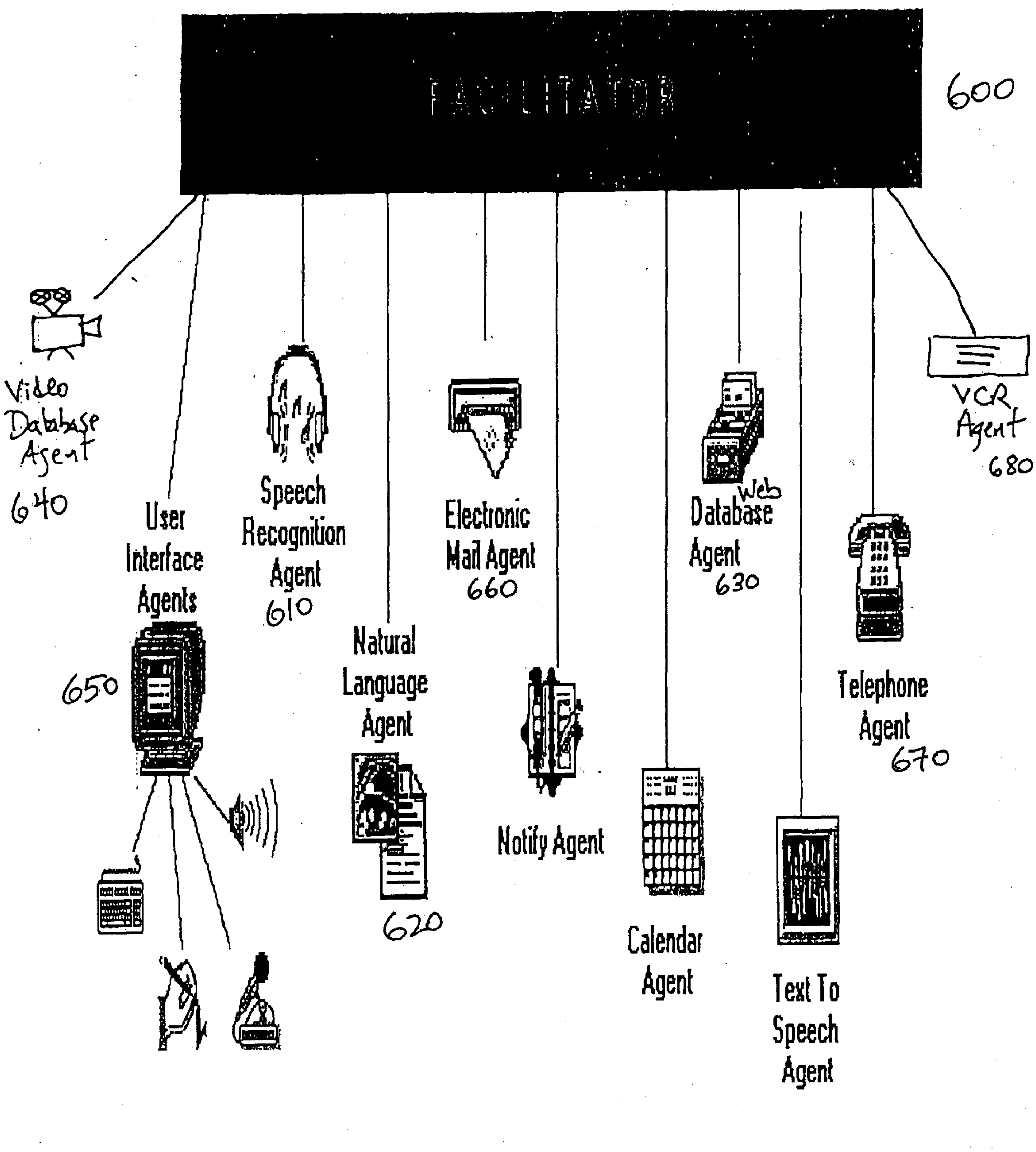

FACILITATOR
600
Video Database Agent
640
User Interface Agents
650
Speech Recognition Agent
610
Natural Language Agent
620
Electronic Mail Agent
660
Notify Agent
Calendar Agent
Web Database Agent
630
Text To Speech Agent
Telephone Agent
670
VCR Agent
680

Fig. 6

PRINT OF DRAWINGS
AS ORIGINALLY FIL

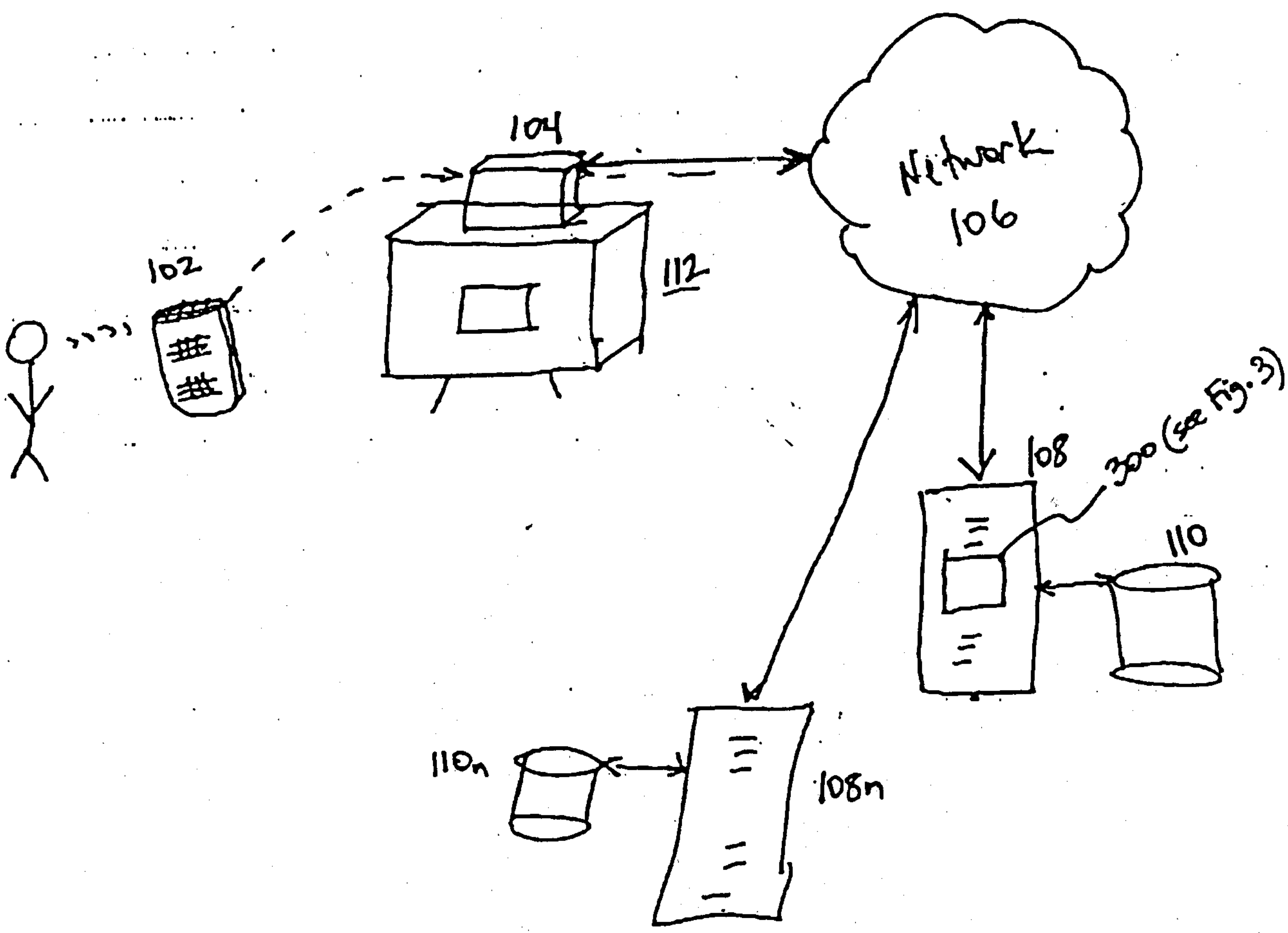


Fig. 1a

PRINT OF DRAWINGS
AS ORIGINALLY FIL

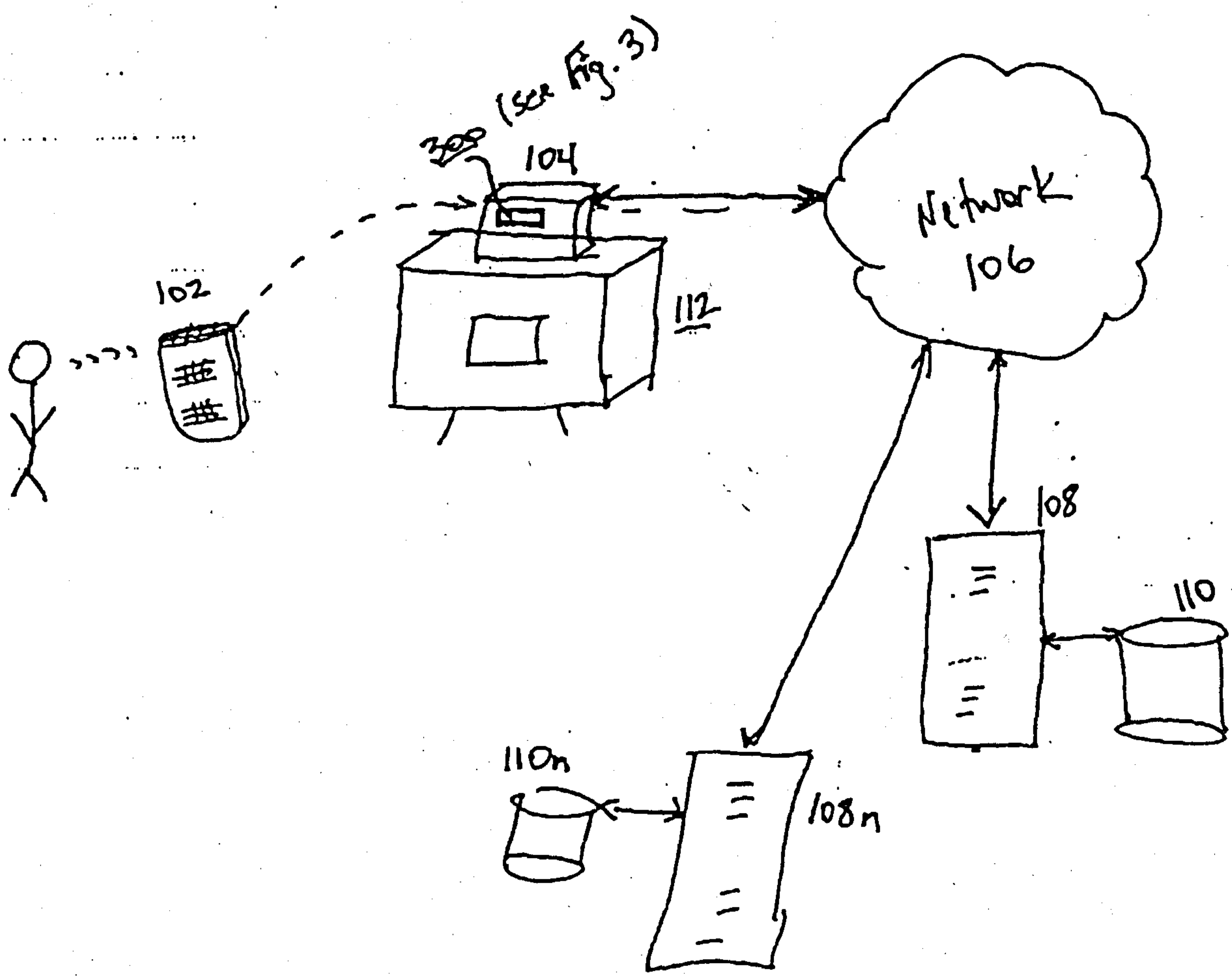


Fig. 1b

PRINT OF DRAWINGS
AS ORIGINALLY FIL

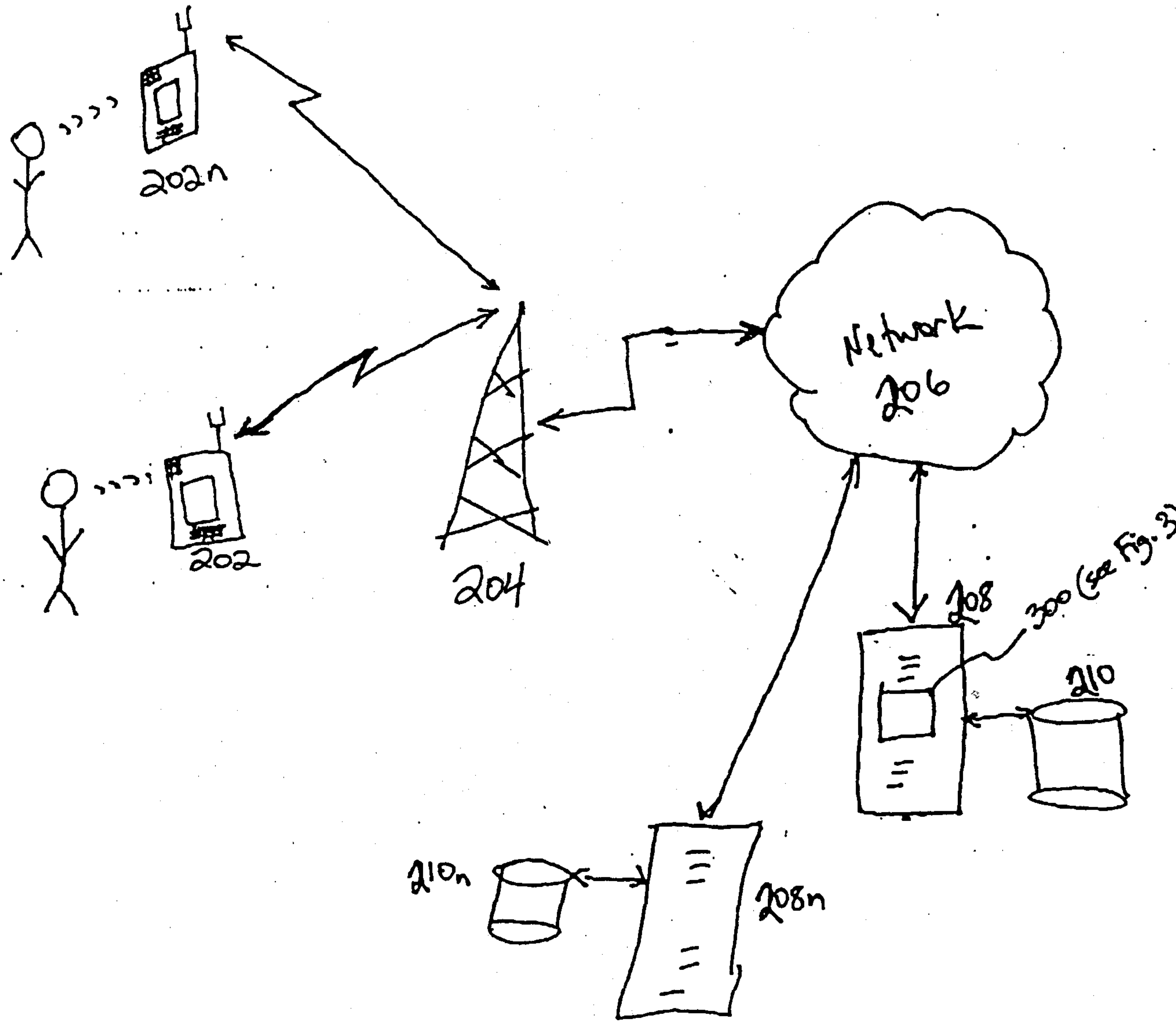


Fig. 2

Request Processing logic 300

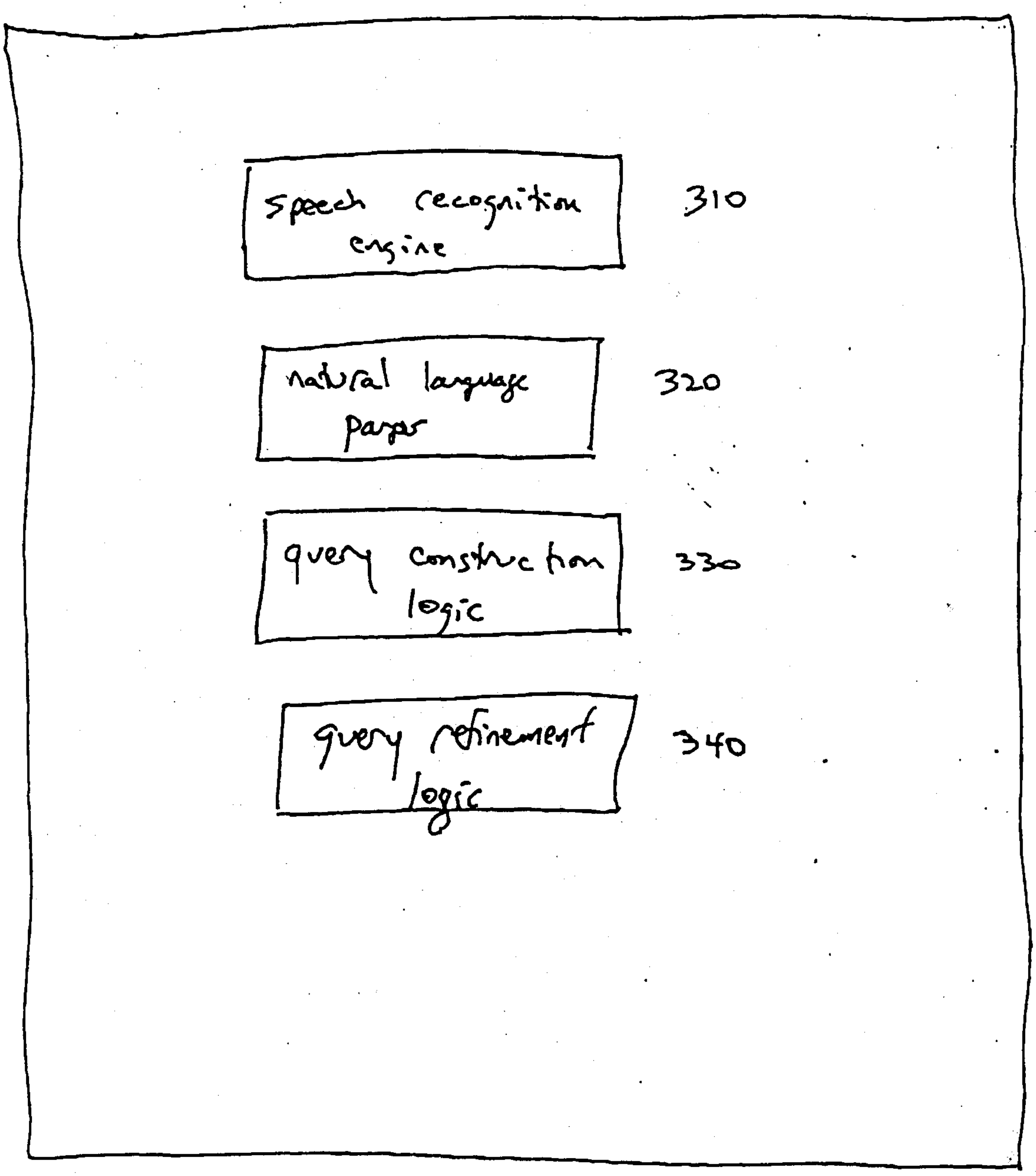


Fig. 3

PRINT OF DRAWINGS
AS ORIGINALLY FIL

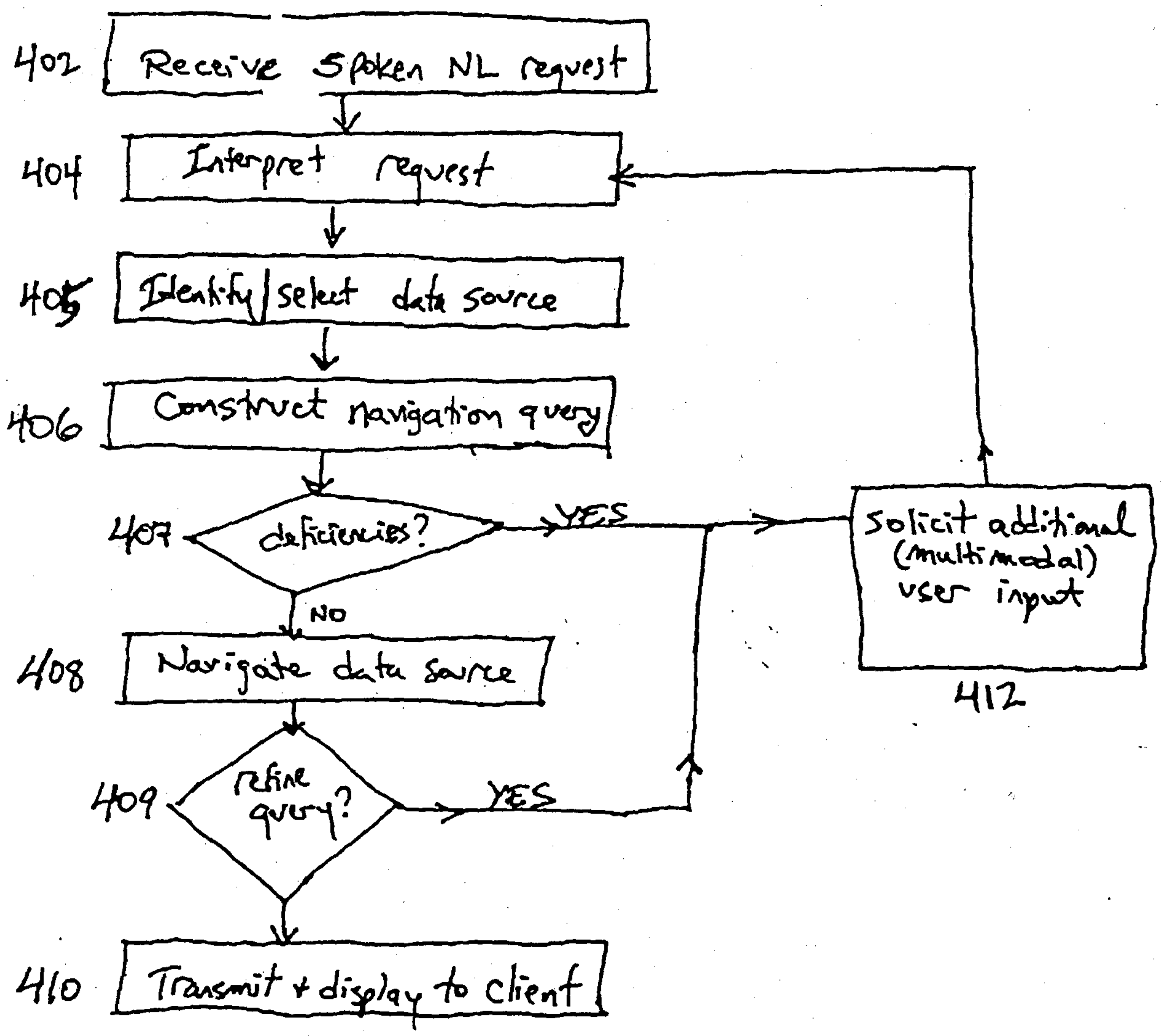
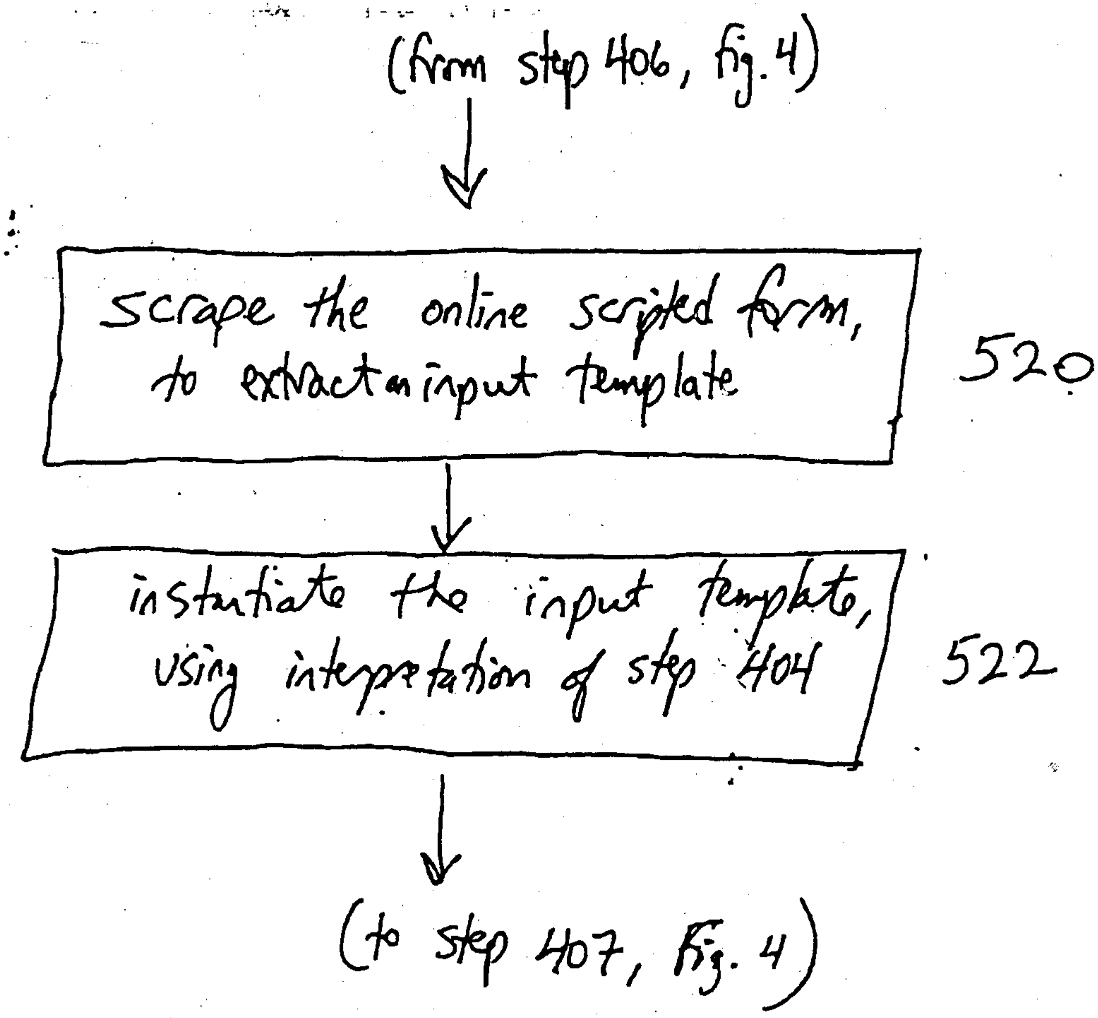


Fig. 4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522
(to step 407, Fig. 4)

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PRINT OF DRAWINGS
AS ORIGINALLY FIL'

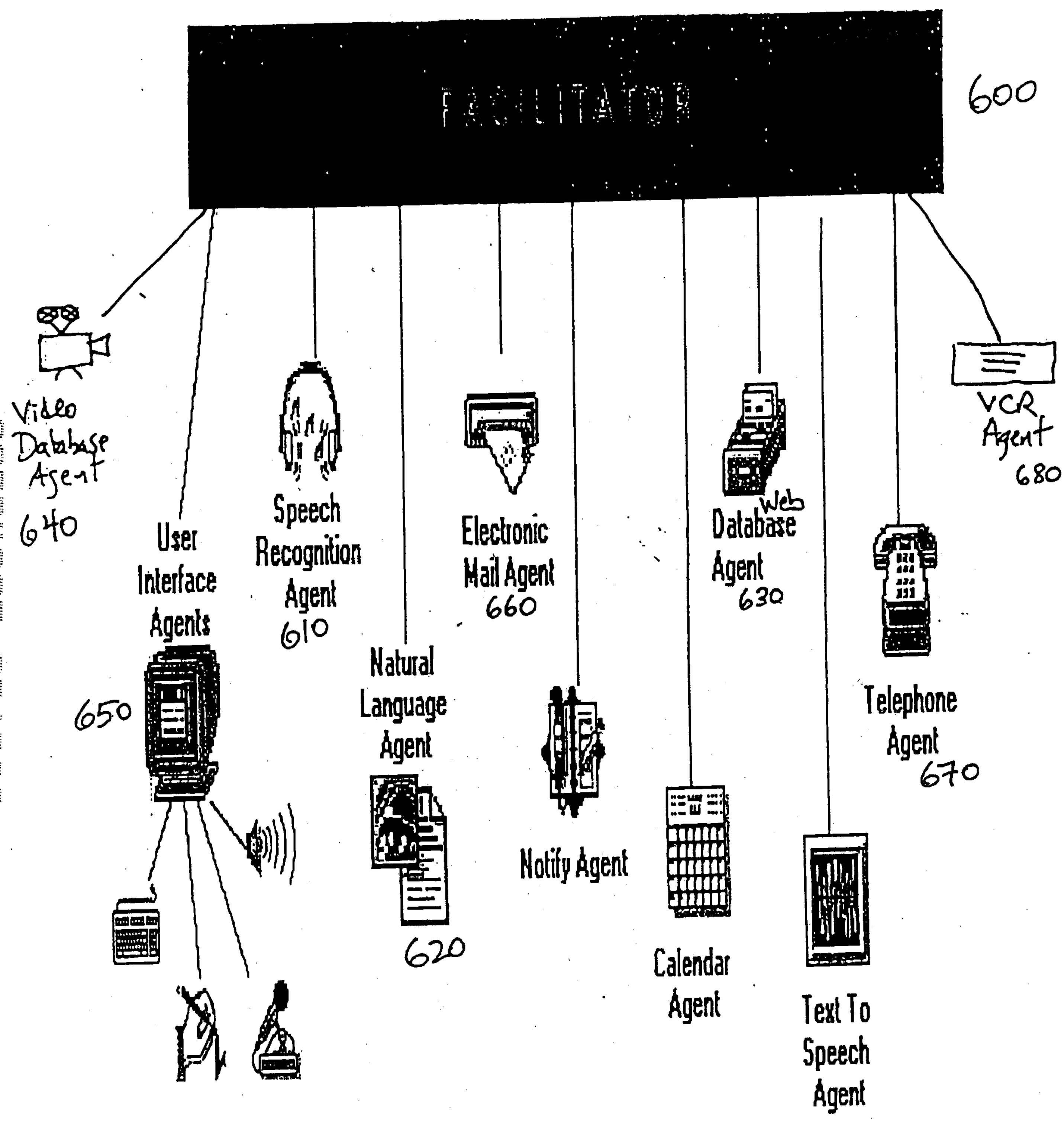

Fig. 6

3-15-00

jc586 U.S. PTO
03/13/00

A

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF EXPRESS MAILING

This transmittal and the documents and/or fees itemized hereon and attached hereto have been deposited as "Express Mail Post Office to Addressee" in accordance with 37 CFR §1.10 with Mailing Label Number **EL357581014US**.

Attorney Docket No.: SRI1P037

First Named Inventor:

HALVERSON, Christine

jc530 U.S. PTO 09/524095 03/13/00

UTILITY PATENT APPLICATION TRANSMITTAL (37 CFR. § 1.53(b))

(Continuation, Divisional or Continuation-in-part application)

Assistant Commissioner for Patents
Box Patent Application
Washington, DC 20231

☐ Duplicate for fee processing

Sir: This is a request for filing a patent application under 37 CFR. § 1.53(b) in the name of inventors:
Christine Halverson

For: **NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK**

This application is a ☐ Continuation ☐ Divisional ☒ Continuation-in-part

of prior Application No.: **09/225,198**, from which priority under 35 U.S.C. §120 is claimed.

Application Elements:

☒ 33 Pages of Specification, Claims and Abstract
☒ 07 Sheets of Drawings
☐ Combined Declaration and Power of Attorney
☐ Newly executed (original or copy)
☐ Copy from a prior application (37 CFR 1.63(d) for a continuation or divisional). The entire disclosure of the prior application from which a copy of the declaration is herein supplied is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.
☐ Deletion of inventors Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).

Accompanying Application Parts:

☐ Assignment and Assignment Recordation Cover Sheet (recording fee of $40.00 enclosed)
☐ Power of Attorney
☐ 37 CFR 3.73(b) Statement by Assignee
☒ Information Disclosure Statement with Form PTO-1449 ☒ Copies of IDS Citations

☐ Preliminary Amendm... New claims numbered after highest or... al claim in prior application.)

☒ Return Receipt Postcard

☒ Small Entity Statement(s) ☒ Statement filed in prior application. Status still proper and desired.

☐ Other:

Claim For Foreign Priority

☐ Priority of ________ Application No. _________ filed on __________ is claimed under 35 U.S.C. § 119.

☐ The certified copy has been filed in prior application U.S. Application No. ______

☐ The certified copy will follow.

Extension of Time for Prior Pending Application

☐ A Petition for Extension of Time is being concurrently filed in the prior pending application. A copy of the Petition for Extension of Time is attached.

Amendments

☐ Amend the specification by inserting before the first line the sentence: "This is a

☐ Continuation ☐ Continuation-in-part ☐ Divisional

application of copending prior

☐ Application No.________ filed on _____________,

☐ International Application _________ filed on _________ which designated the United States,

the disclosure of which is incorporated herein by reference."

☐ Cancel in this application original claims ________ of the prior application before calculating the filing fee. (*At least one original independent claim must be retained.*)

Fee Calculation (37 CFR § 1.16)

	(Col. 1) NO. FILED	(Col. 2) NO. EXTRA	SMALL ENTITY RATE	FEE	OR	LARGE ENTITY RATE	FEE
BASIC FEE			$345	$345.	OR	$690	$
TOTAL CLAIMS	_____ -20 =	_____	x09 =	$	OR	x18 =	$
INDEP CLAIMS	_____ -03 =	_____	x39 =	$	OR	x78 =	$
[ ] Multiple Dependent Claim Presented			$130 =	$	OR	$260 =	$
* If the difference in Col. 1 is less than zero, enter "0" in Col. 2.			Total	$	OR	Total	$

☐ Check No. ______ in the amount of $_______ is enclosed.

☒ The Commissioner is authorized to charge any fees beyond the amount enclosed which may be required, or to credit any overpayment, to Deposit Account No. 50-0384 (Order No. SRI1P037).

General Authorization for Petition for Extension of Time (37 CFR §1.136)

☒ Applicants hereby make and generally authorize any Petitions for Extensions of Time as may be needed for any subsequent filings. The Commissioner is also authorized to charge any extension fees under 37 CFR §1.17 as may be needed to Deposit Account No. 50-0384 (Order No. SRI1P037).

☒ Please send correspondence to the following address:

HICKMAN STEPHENS COLEMAN & HUGHES, LLP
P. O. Box 52037
Palo Alto, California 94303-0746
(408) 558-9950

Customer No.::

Date: March 13, 2000

Dominic M. Kotab
Registration No. 42,762

PATENT APPLICATION SERIAL NO. ______________________

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE
FEE RECORD SHEET

03/29/2000 SDAVIS 00000028 500384 09524095

01 FC:101 690.00 CH
02 FC:103 630.00 CH

PTO-1556
(5/87)

*U.S. GPO: 1999-459-082/19144

FORMALITIES LETTER

OC000000005113304

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: COMMISSIONER OF PATENT AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NUMBER	FILING/RECEIPT DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NUMBER
09/524,095	03/13/2000	Christine Halverson	SRI1P037

Hickman Stephens Coleman & Hughes LLP
PO Box 52037
Palo Alto, CA 94303-0746

Date Mailed: 05/12/2000

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given TWO MONTHS from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The oath or declaration is missing.
  A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.
- To avoid abandonment, a late filing fee or oath or declaration surcharge as set forth in 37 CFR 1.16(e) of $130 for a non-small entity, must be submitted with the missing items identified in this letter.
- **The balance due by applicant is $ 130.**

A copy of this notice MUST be returned with the reply.

Customer Service Center
Initial Patent Examination Division (703) 308-1202

PART 3 - OFFICE COPY

OIPE JC117 AUG 21 2000 PATENT & TRADEMARK OFFICE

04C8 SE TOR #3

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of	
	Examiner: Not Assigned
Luc Julia et al.	
	Art Unit: Not Assigned
Application No. 09/524,095	
	Atty. Docket No. AND1P037
Filed: 3/13/2000	
	Date: 8/17/00
For: Navigating Network-Based Electronic Information Using Spoken Natural Language Input With Multimodal Error Feedback	

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on August 17, 2000.

Signed: ______________________
Kimberly Main

RESPONSE TO NOTICE TO FILE MISSING PARTS

Assistant Commissioner for Patents
Box: Missing Parts
Washington, D.C. 20231

Sir:

In response to the Notice to File Missing Parts of Application--Filing Date Granted dated May 12, 2000, Applicants hereby attach an original executed Declaration and Power of Attorney, an Assignment document, an Assignment Recordation Cover Sheet, and the copy of the Notice to be returned with this response. Applicants are also enclosing a copy of the previously filed Small Entity Statement, filed on the parent case of this application, serial number 09/225,198, which accounts for the fees being paid as a small entity on this case. We are also enclosing check number 6331, in the amount of $105.00, for the missing fees, and the assignment recordation. We are also request a two-month extension of time in which to responds to this matter, check number 6812, in the amount of $190.00 is also enclosed.

08/23/2000 WKOROMA 00000088 09524095
01 FC:216 190.00 OP

Attorney Docket No. SRI1P037

The Commissioner is authorized to charge any other fees that may be due to our Deposit Account No. 50-0384 (Order No. SRI1P037). A copy of this sheet is enclosed for this purpose.

Respectfully submitted,
HICKMAN COLEMAN & HUGHES, LLP

Raymond E. Roberts
Reg. No. 38,597

P.O. Box 52037
Palo Alto, CA 94303-0746
(408) 558-9950

PATENT #3

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of	)
	) Examiner: Not Assigned
Luc Julia et al.	)
	) Art Unit: Not Assigned
Application No. 09/524,095	)
	) Atty. Docket No. AND1P037
Filed: 3/13/2000	)
	) Date: 8/17/00
For:	)
Navigating Network-Based Electronic	)
Information Using Spoken Natural Language	)
Input With Multimodal Error Feedback	)

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on August 17, 2000.

Signed: ____________________
Kimberly Main

RESPONSE TO NOTICE TO FILE MISSING PARTS

Assistant Commissioner for Patents
Box: Missing Parts
Washington, D.C. 20231

Sir:

In response to the Notice to File Missing Parts of Application--Filing Date Granted dated May 12, 2000, Applicants hereby attach an original executed Declaration and Power of Attorney, an Assignment document, an Assignment Recordation Cover Sheet, and the copy of the Notice to be returned with this response. Applicants are also enclosing a copy of the previously filed Small Entity Statement, filed on the parent case of this application, serial number 09/225,198, which accounts for the fees being paid as a small entity on this case. We are also enclosing check number 6331, in the amount of $105.00, for the missing fees, and the assignment recordation. We are also request a two-month extension of time in which to responds to this matter, check number 6812, in the amount of $190.00 is also enclosed.

The Commissioner is authorized to charge any other fees that may be due to our Deposit Account No. 50-0384 (Order No. SRI1P037). A copy of this sheet is enclosed for this purpose.

Respectfully submitted,
HICKMAN COLEMAN & HUGHES, LLP

Raymond E. Roberts
Reg. No. 38,597

P.O. Box 52037
Palo Alto, CA 94303-0746
(408) 558-9950

Attorney Docket No. SRI1P037

DECL \TION AND POWER OF AT 'RNEY FOR O..GINAL U.S. PATENT APPLIC.ATION

Attorney's Docket No. SRI1P037 #7

O.I.P.E. AUG 21 2000 PATENT & TRADEMARK OFFICE

As a below-named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: NAVIGATING NETWORK-BASED ELECTRONIC INFORMATIN USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK, the specification of which,

(check one) 1. ☐ is attached hereto.

2. ☒ was filed on March 13, 2000 as U.S. Application Serial No. 09/524,095 and was amended on ______.

3. ☐ was filed on ______ as International PCT Application Serial No. ______ and was amended on ______.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, CFR § 1.56.

I hereby claim foreign priority benefits under Title 35, United States code, § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)			Priority Benefits Claimed?
(Appl. No.)	(Country)	(Filing Date)	☐Yes ☐No
(Appl. No.)	(Country)	(Filing Date)	☐Yes ☐No
(Appl. No.)	(Country)	(Filing Date)	☐Yes ☐No

I hereby claim the benefit under 35 U.S.C. §119(e) of any United States provisional application(s) listed below:

(Application Serial No.)	(Filing Date)
(Application Serial No.)	(Filing Date)

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s), or § 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

Prior U.S. Application(s)

(Application Serial No.)	(Filing Date)	(Status - patented, pending, abandoned)
(Application Serial No.)	(Filing Date)	(Status - patented, pending, abandoned)

OIPE AUG 21 2000 PATENT & TRADEMARK OFFICE

And I hereby appoint the law firm of Hickman Stephens Coleman & Hughes, including **Paul L. Hickman (Reg. No. 28,516); L. Keith Stephens (Reg. No. 32,632); Brian R. Coleman (Reg. No. 39,145); Michael J. Hughes (Reg. No. 29,077); Michael E. Melton (Reg. No. 32,276); Raymond E. Roberts (Reg. No. 38,597); Vidya R. Bhakar (Reg. No. 42,323); Larry B. Guernsey (Reg. No. 40,008); Douglas E. Mackenzie (Reg. No. 38,955); Michael D. Plimier (Reg. No. 43,004); Ronald B. Feece (Reg. No. P46,327); Stefanie M. Howell (Reg. No. P45,929); and Robert D. Hayden (Reg. No. 42,645)** as my principal attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

Send Correspondence To: **HICKMAN STEPHENS COLEMAN & HUGHES, LLP**
P.O. BOX 52037
Palo Alto, California 94303-0746

Direct Telephone Calls To: **Raymond E. Roberts at telephone number (408) 558-9950**

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Typewritten Full Name of Sole or First Inventor: Christine Halverson — Citizenship: USA

Inventor's signature: Christine A Halverson — **Date of Signature:** 6-16-00

Residence: (City) San Jose — (State/Country) California/USA

Post Office Address: 1623 Fairorchard Avenue, San Jose, California 95125

Full Name of Second Joint Inventor (if any): Luc Julia — Citizenship: USA

Inventor's signature: — **Date of Signature:** 6.21.00

Residence: (City) Menlo Park — (State/Country) California/USA

Post Office Address: 607 Menlo Avenue, Menlo Park, California 94025

Full Name of Third Joint Inventor (if any): Dimitris Voutsas — Citizenship: Greece

Inventor's signature: — **Date of Signature:** 6/16/00

Residence: (City) Thessaloniki — (State/Country) Greece

Post Office Address: 14 M. Pyrza Street, Neoi Epivates, Thessaloniki 57019, Greece

Prior U.S. Application(s)

(Application Serial No.)	(Filing Date)	(Status - patented, pending, abandoned)
(Application Serial No.)	(Filing Date)	(Status - patented, pending, abandoned)

OIPE JC117 AUG 21 2000 PATENT & TRADEMARK OFFICE

And I hereby appoint the law firm of Hickman Stephens Coleman & Hughes, including **Paul L. Hickman (Reg. No. 28,516); L. Keith Stephens (Reg. No. 32,632); Brian R. Coleman (Reg. No. 39,145); Michael J. Hughes (Reg. No. 29,077); Michael E. Melton (Reg. No. 32,276); Raymond E. Roberts (Reg. No. 38,597); Vidya R. Bhakar (Reg. No. 42,323); Larry B. Guernsey (Reg. No. 40,008); Douglas E. Mackenzie (Reg. No. 38,955); Michael D. Plimier (Reg. No. 43,004); Ronald B. Feece (Reg. No. P46,327); Stefanie M. Howell (Reg. No. P45,929); and Robert D. Hayden (Reg. No. 42,645)** as my principal attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

Send Correspondence To: **HICKMAN STEPHENS COLEMAN & HUGHES, LLP**
P.O. BOX 52037
Palo Alto, California 94303-0746

Direct Telephone Calls To: **Raymond E. Roberts at telephone number (408) 558-9950**

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Typewritten Full Name of Sole or First Inventor: Christine Halverson — Citizenship: USA

Inventor's signature: Christine Halverson — **Date of Signature:** 6-16-00

Residence: (City) San Jose — (State/Country) California/USA

Post Office Address: 1623 Fairorchard Avenue, San Jose, California 95125

Full Name of Second Joint Inventor (if any): Luc Julia — Citizenship: USA

Inventor's signature: ______ — **Date of Signature:** ______

Residence: (City) Menlo Park — (State/Country) California/USA

Post Office Address: 607 Menlo Avenue, Menlo Park, California 94025

Full Name of Third Joint Inventor (if any): Dimitris Voutsas — Citizenship: Greece

Inventor's signature: [signature] — **Date of Signature:** 6/16/00

Residence: (City) Thessaloniki — (State/Country) Greece

Post Office Address: 14 M. Pyrza Street, Neoi Epivates, Thessaloniki 57019, Greece

Full Name of Fourth Joint Inventor (if any): A Cheyer

Citizen: USA

Inventor's signature: Adam J. Cheyer

Date of Signature: 6/22/00

Residence: (City) Palo Alto (State/Country) California /USA

Post Office Address: 757 Cereza Drive, Palo Alto, California 94306

OIPE JC117
AUG 2 1 2000
PATENT & TRADEMARK OFFICE

#3

HS&C Docket No. SRI1P016
SRI Docket No. US3949-2

PATENT

VERIFIED STATEMENT CLAIMING SMALL-ENTITY STATUS
(37 CFR 1.9(f) & 1.27(d))--NONPROFIT ORGANIZATION

Applicant or Patentee: Adam J. Cheyer et al.
Serial or Patent No.: 09/225198
Filed or Issued: January 5, 1999
Title: SOFTWARE-BASED ARCHITECTURE FOR COMMUNICATION AND COOPERATION AMONG DISTRIBUTED ELECTRONIC AGENTS

I hereby declare that I am an official empowered to act on behalf of the nonprofit organization identified below:

NAME OF NONPROFIT ORGANIZATION: SRI International
ADDRESS OF NONPROFIT ORGANIZATION: 333 Ravenswood Avenue
Menlo Park, CA 94025-3493
TYPE OF NONPROFIT ORGANIZATION:

[ ] UNIVERSITY OR OTHER INSTITUTION OF HIGHER EDUCATION

[X] TAX-EXEMPT UNDER INTERNAL REVENUE SERVICE CODE (26 USC 501(a) and 501(c)(3))

[X] NONPROFIT SCIENTIFIC OR EDUCATIONAL UNDER STATUTE OF STATE OF THE UNITED STATES OF AMERICA
(NAME OF STATE: California)
(CITATION OF STATUTE: Sections 5110 et seq., California Corporations Code)

[ ] WOULD QUALIFY AS TEXT-EXEMPT UNDER INTERNAL REVENUE SERIVCE CODE (26 USC 501(a) AND 501(c)(3)) IF LOCATED IN THE UNITED STATES OF AMERICA

[ ] WOULD QUALIFY AS NONPROFIT SCIENTIFIC OR EDUCATIONAL UNDER STATUTE OF STATE OF THE UNITED STATES OF AMERICA IF LOCATED IN THE UNITED STATES OF AMERICA
(NAME OF STATE:)
(CITATION OF STATUTE:)

I hereby declare that the nonprofit organization identified above qualifies as a nonprofit organization as defined in 37 CFR 1.9(e) for purposes of paying reduced fees to the United States Patent and Trademark Office regarding the invention in:

[ ] the specification filed herewith with title as listed above.

[X] the application identified above.

[ ] the patent identified above.

I hereby declare that rights under contract or law have been conveyed to and remain with the non-profit organization regarding the above-identified invention. If the rights held by the nonprofit organization are not exclusive, each individual, concern, or organization having rights in the inven-tion must file separate verified statements averring to their status as small entities and that no rights to the invention are held by any person, other than the inventor, who would not qualify as an independent inventor under 37 CFR

HS&C Docket No. SRI-P016
SRI Docket No. US3949-2

PATENT

1.9(c) if that person made the invention, or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern, or organization having any rights in the invention is listed below:

[X] no such person, concern, or organization exists.

[ ] each such person, concern, or organization is listed below.

NAME:
ADDRESS:

[ ] INDIVIDUAL [ ] SMALL BUSINESS CONCERN [ ] NONPROFIT ORGANIZATION

NAME:
ADDRESS:

[ ] INDIVIDUAL [ ] SMALL BUSINESS CONCERN [ ] NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate (37 CFR 1.28(b)).

I hereby declare that all statements made herein of my own knowledge are true, and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING: Mary Lou Joyner
TITLE IN ORGANIZATION: Assistant Secretary
ADDRESS OF PERSON SIGNING: 333 Ravenswood Ave., Menlo Park, CA 94025-3493

SIGNATURE: Mary Lou Joyner DATE: March 4, 1999

OIPE JC17
AUG 2 1 2000
PATENT & TRADEMARK OFFICE

#7

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	)	Group Art Unit: 2755
Adam J. CHEYER et al.	)	Examiner: Not Assigned
Serial No. 09/225,198	)	Attorney Docket No. (SRI1P016)
Filed: January 5, 1999	)	Date: March 5, 1999
For: SOFTWARE-BASED ARCHITECTURE FOR COMMUNICATION AND COOPERATION AMONG DISTRIBUTED ELECTRONIC AGENTS	)	

CERTIFICATE OF MAILING
I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, DC 20231 on March 5, 1999.
Signed: Jayashree Vasudevan
Jayashree Vasudevan

Commissioner of Patents and Trademarks
Washington, DC 20231

ATTENTION: Refund Section, Accounting Division, Office of Finance

REQUEST FOR REFUND

(Improper charge of Deposit Account)

I. REFUND REQUEST

This is a request for a refund with respect to the charge to Deposit Account 50-0384 shown on the statement dated January 29, 1999 (Order No. SRI1P016) for the above-identified patent. A copy of the monthly statement in which the error referred to occurs, accompanies this request.

II. FEES CHARGED FOR WHICH REFUND REQUESTED

Basic Fee	$ 760.00
Sixty nine (69) claims	$1242.00
Three (3) Independent Claims	$ 234.00

for the total amount of **$2236.00** in the above referenced application.

III. EXPLANATION OF WHY CONTESTED CHARGE IS IN ERROR

The above mentioned charges as a **large entity** were charged to our Deposit Account No. 50-0384. Enclosed herewith is a true facsimile copy of Verified Statement Claiming Small Entity Status by our client (SRI International) as a Non-Profit Organization.

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AUG 21 2000
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IV. MANNER OF REFUND

Please make refund by crediting Account No. 50-0384 (Order No. SRI1P016) in the amount of **$1118.00.**

Respectfully submitted,
HICKMAN STEPHENS & COLEMAN, LLP

Brian R. Coleman
Reg. No. 39,145

Hickman Stephens & Coleman, LLP
P.O. Box 52037
Palo Alto, CA 94303-0746
(650)470-7430

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AUG 21 2000
PATENT & TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

ONTHLY STATEMENT
F DEPOSIT ACCOUNT

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Washington, D.C. 20231

replenish your Deposit Account, detach and
urn top portion with your check. Make check
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Account No.	500384
Date	1-29-99
Page	1

HICKMAN & MARTINE LLP
HUSAM Y HAMMAD
200 PAGE MILL ROAD, SUITE 100

PALO ALTO CA 94306

FINA

PLEASE SEND REMITTANCES TO:
Patent and Trademark Office
P.O. Box 70541
Chicago, Ill. 60673

STED Y	YR.	CONTROL NO.	DESCRIPTION (Serial, Patent, TM, Order)	DOCKET NO.	FEE CODE	CHARGES/ CREDITS	BALANCE
4	99	PLH 164	09166819	DHL1P001	103	Reg Fee 607.00	Refund 4417.00
5	99	52	PCT/US98/21030	SAS1P432.PCT	899	105.00	4312.00
5	99	53	PCT/US98/21030		157	157.50 52.50	Call PTO 4259.50
6	99	47	09218542	LAM1P084	102	20.00	4239.50
6	99	49	09218542	LAM1P084	581	60.00 40.00	2/99 4199.50
7	99	66	09220738	ADAPP068	103	20.00	4179.50
7	99	68	09220738	ADAPP068	581	60.00 40.00	2/99 4139.50
8	99	348	09174491	ELECP003A	101	-790.00	offset 4929.50
8	99	351	09174491	ELECP003A	101	30.00	by 10/98 4899.50 Debit
1	99	356	08766513 NOT OURS		704	-55.00	Call PTO 4954.50
2	99	38	PAYMENT		701	-5000.00	9954.50
2	99	144	60114493	LAM1P083+	114	150.00	2/99 9804.50
4	99	71	09214694	KKF1P004	704	-90.00	2/99 9894.50
4	99	193	09173583		105	42.00	9852.50
4	99	195	09173583	ELECP006A	581	82.00 40.00	2/99 9812.50
15	99	126	09225198	SRI1P016	581	40.00	2/99 9772.50
19	99	50	09225198	SRI1P016	101	760.00	1/31/99 9012.50
19	99	51	09225198	SRI1P016	102	234.00	1/31/99 8778.50
19	99	52	09225198	SRI1P016	103	1242.00	1/31/99 7536.50
21	99	20	09226380	ELECP010A	101	760.00	charge 6776.50 when
21	99	21	09226380	ELECP010A	102	234.00	in due 6542.50 we
21	99	22	09226380	ELECP010A	103	306.00	March 6236.50 file
21	99	PLH 78	PCT/US98/12578	BEM1P001.PCT	803	40.00	2/99 6196.50
21	99	TRB 149	09138304	THM1P049	101	158.00	2/99 6038.50
22	99	BRC 64	09169638	TNT1P020	103	274.00	2/99 5764.50
22	99	PLH 70	PCT/US98/12591	THM1P030.PCT	803	40.00	2/99 5724.50
22	99	PLH 184	PCT/US98/12389	THM1P031.PCT	803	Call PTO 40.00	Call PTO 5684.50
26	99	86	09169750		103	92.00	5592.50
26	99	88	09169750	TNT1P018	581	Reg. Fee 40.00	Refund 5552.50
26	99	134	09138309	THM1P050	116	146.00	2/99 5406.50
26	99	TRB 136	09179382	IMM1P054	103	162.00	2/99 5244.50
27	99	12	08807709	SAS1P008B	116	380.00	2/99 4864.50
29	99	395	5701140	THM1P007.US	145	100.00	2/99 4764.50

AMOUNT SUFFICIENT TO	OPENING BALANCE	TOTAL CHARGES	TOTAL CREDITS	CLOSING BALANCE
	5024.00	6194.50	5935.00	4764.50

#3

OIPE JC11
AUG 2 1 2000
PATENT & TRADEMARK OFFICE

PATENT POSTCARD

Docket No. SRI1P016 Appln. No. 09/225,198 Date: March 5, 1999

By: BRC/jv Filing Date: January 5, 1999 Express Mail No.:

Inventor(s): Adam J. Cheyer et al.

Title: SOFTWARE-BASED ARCHITECTURE FOR COMMUNICATION AND COOPERATION AMONG DISTRIBUTED ELECTRONIC AGENTS

The following has been received in the U.S. Patent & Trademark Office on the date stamped below:

X Return Receipt Postcard
X Request for Refund
X Verified Statement Claiming Small-Entity Status
X Monthly Statement of Deposit Account dated 1/29/99

OIPE JC52
MAR 1 2 1999
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RECD MAR 2 2 1999

PATENT POSTCARD

Docket No.	SRI1P016	Appln. No.:	09/225,198	Date:	March 5, 1999
By:	BRC/jv	Filing Date:	January 5, 1999	Express Mail No.:	

Inventor(s): Adam J. Cheyer et al.

Title: SOFTWARE-BASED ARCHITECTURE FOR COMMUNICATION AND COOPERATION AMONG DISTRIBUTED ELECTRONIC AGENTS

The following has been received in the U.S. Patent & Trademark Office on the date stamped below:

X Return Receipt Postcard
X Request for Refund
X Verified Statement Claiming Small-Entity Status
X Monthly Statement of Deposit Account dated 1/29/99

Hickman Stephens ... LLP
U.S.: ✓ Foreign:
Docketed: 3/8/99 By: AP
Action: Small Entity filed
Due Date: Refund received
Atty: BRC / BNA
Docket #: SRI1P016.US

Status inquiry re refund
6/5/99

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OIPE JC17 AUG 21 2000 PATENT & TRADEMARK OFFICE

file:///c:/APPS/preexam/correspondence/3.htm

#3

FORMALITIES LETTER

OC000000005113304

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: COMMISSIONER OF PATENT AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NUMBER	FILING/RECEIPT DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NUMBER
09/524,095	03/13/2000	Christine Halverson	SRI1P037

Hickman Stephens Coleman & Hughes LLP
PO Box 52037
Palo Alto, CA 94303-0746

Date Mailed: 05/12/2000

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given TWO MONTHS from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The oath or declaration is missing.
  A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.
- To avoid abandonment, a late filing fee or oath or declaration surcharge as set forth in 37 CFR 1.16(e) of $130 for a non-small entity, must be submitted with the missing items identified in this letter.
- **The balance due by applicant is $ 130.**

A copy of this notice MUST be returned with the reply.

Customer Service Center
Initial Patent Examination Division (703) 308-1202
PART 2 - COPY TO BE RETURNED WITH RESPONSE

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of Christine HALVERSEN et al. Application No. 09/524,095 Filed: March 13, 2000 For: NAVIGATING NETWORK BASED ELECTRONIC INFORMATION USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK	Docket: SRI1P037A Date: June 30, 2000

OIPE JC147 JUL 05 2000 PATENT & TRADEMARK OFFICE

Preliminary Amendment

Assistant Commissioner for Patents
and Trademarks
Washington, DC 20231

Dear Sir:

In regard to the above-named patent application, please enter the following amendments.

IN THE TITLE:

Please delete "NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK", and insert therefor-- NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN INPUT WITH MULTIMODAL ERROR FEEDBACK--.

IN THE ABSTRACT:

Please delete the Abstract and insert therefore --A system, method, and article of manufacture are provided for navigating an electronic data source by means of spoken language.

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01 FC:203 144.00 OP

2

When a spoken input request is received from a user, it is interpreted. Additional input is solicited from the user in a modality different than the original request and used to refine the navigation query. The resulting interpretation of the request is thereupon used to automatically construct an operational navigation query to retrieve the desired information from one or more electronic network data sources.

a1

IN THE SPECIFICATION:

Please delete page 3, lines 3 to 32, and insert therefore, --The present invention addresses the above needs by providing a system, method, and article of manufacture for navigating network-based electronic data sources in response to spoken input requests. When a spoken input request is received from a user, it is interpreted, such as by using a speech recognition engine to extract speech data from acoustic voice signals, and using a language parser to linguistically parse the speech data. The interpretation of the spoken request can be performed on a computing device locally with the user or remotely from the user. The resulting interpretation of the request is thereupon used to automatically construct an operational navigation query to retrieve the desired information from one or more electronic network data sources, which is then transmitted to a client device of the user. If the network data source is a database, the navigation query is constructed in the format of a database query language.

a2

Typically, errors or ambiguities emerge in the interpretation of the spoken request, such that the system cannot instantiate a complete, valid navigational template. This is to be expected occasionally, and one preferred aspect of the invention is the ability to handle such errors and ambiguities in relatively graceful and user-friendly manner. Instead of simply rejecting such input and defaulting to traditional input modes or simply asking the user to try again, a preferred embodiment of the present invention seeks to converge rapidly toward instantiation of a valid navigational template by soliciting additional clarification from the user as necessary, either before or after a navigation of the data source, via multimodal input, i.e., by means of menu selection or other input modalities including and in addition to spoken input. This clarifying, multi-modal dialogue takes advantage of whatever partial navigational information has been gleaned from the initial interpretation of the user's spoken request. This clarification process continues until the system converges toward an adequately instantiated navigational template, which is in turn used to navigate the network-based data and retrieve the user's desired information. The retrieved information is transmitted across the network and presented to the user on a suitable client display device.

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IN THE CLAIMS:

Please delete claims 1-55, and insert therefore the following claims 1-66:

Rule 1.126

56. ~~1.~~ (New) A method for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising the steps of:

(a) receiving a spoken request for desired information from the user;

(b) rendering an interpretation of the spoken request;

(c) constructing at least part of a navigation query based upon the interpretation;

(d) soliciting additional input from the user, including user interaction in a modality different than the original request;

(e) refining the navigation query, based upon the additional input;

(f) using the refined navigation query to select a portion of the electronic data source; and

(g) transmitting the selected portion of the electronic data source from the network server to a client device of the user.

R1.126

57 ~~2~~. (New) The method of claim ~~1~~ 56, wherein the step of rendering an interpretation further includes deriving linguistic information by using a speech recognition engine and a linguistic parser.

58 ~~3~~. (New) The method of claim ~~1~~ 56, wherein the step of constructing a navigation query further includes the steps of extracting an input template for an online scripted interface to the data source, and using the input template to construct the navigation query.

59 ~~4~~. (New) The method of claim ~~3~~ 58, wherein the step of extracting an input template includes dynamically scraping the online scripted interface.

60 ~~5~~. (New) The method of claim ~~1~~ 56, wherein the navigation query is constructed in the format of a database query language.

61 ~~6~~. (New) The method of claim ~~1~~ 56, wherein the step of rendering an interpretation and the step of constructing a navigation query are performed, at least in part, on a computing device located locally with the user.

a3

62 ~~7~~. (New) The method of claim ~~1~~ 56, wherein the step of rendering an interpretation and the step of constructing a navigation query are performed, at least in part, on a network computing device located remotely from the user.

63 ~~8~~. (New) The method of claim ~~1~~ 56, wherein the step of soliciting additional input is performed in response to one or more deficiencies encountered during the step of constructing a navigation query.

64 ~~9~~. (New) The method of claim ~~8~~ 63, wherein the deficiencies include unresolved words of the spoken request.

65 ~~10~~. (New) The method of claim ~~8~~ 63, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken request.

R1.126

66 ~~11~~. (New) The method of claim 56 ~~1~~, wherein the step of soliciting additional input is performed in response to one or more deficiencies encountered after a first navigation of the data source using the navigation query constructed in step (c).

67 ~~12~~. (New) The method of claim 66 ~~11~~, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

68 ~~13~~. (New) The method of claim 66 ~~11~~, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

69 ~~14~~. (New) The method of claim 56 ~~1~~, wherein the additional input is solicited upon receiving a user-input statement that additional information is required.

70 ~~15~~. (New) The method of claim 56 ~~1~~, wherein the step of soliciting the additional input includes presenting a menu to the user on the client device of the user.

71 ~~16~~. (New) The method of claim 56 ~~1~~, wherein the step of soliciting the additional input includes presenting a textual request for the additional input.

R3

72 ~~17~~. (New) The method of claim 56 ~~1~~, wherein the step of soliciting the additional input includes an audible request for the additional input.

73 ~~18~~. (New) The method of claim 56 ~~1~~, wherein the step of soliciting the additional input includes presenting a list of portions of the electronic data source that match the navigational query.

74 ~~19~~. (New) The method of claim 56 ~~1~~, wherein additional input received from the user is at least partially speech based.

75 ~~20~~. (New) The method of claim 56 ~~1~~, wherein additional input received from the user includes no spoken input.

76 ~~21~~. (New) The method of claim 56 ~~1~~, wherein steps (d)-(e) are repeated until the navigational query is deemed adequate.

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R1.126 -

77 ~~22~~. (New) The method of claim 56 ~~1~~, wherein the input modality of step (d) includes selecting from a displayed option menu.

78 ~~23~~. (New) The method of claim 77 ~~22~~, wherein the act of selecting from the displayed option menu is performed by speaking.

79 ~~24~~. (New) The method of claim 56 ~~1~~, wherein the method is performed with respect to a plurality of simultaneous users and corresponding client devices.

80 ~~25~~. (New) The method of claim 56 ~~1~~, further including the step of selecting the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken request.

81 ~~26~~. (New) The method of claim 56 ~~1~~, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

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82 ~~27~~. (New) A system for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, the system comprising:

(a) a portable microphone operable to receive a spoken request for desired information from the user;

(b) language processing logic, operable to render an interpretation of the spoken request;

(c) query construction logic, operable to construct a navigation query in response to the interpretation of the spoken request;

(d) user interaction logic, operable to solicit additional input from the user, including user interaction in a modality different than the original request;

(e) query refining logic, operable to refine the navigation query, based upon the additional input;

R1.126

(f) navigation logic, operable to select a portion of the electronic data source using the navigation query; and

(g) electronic communications infrastructure for transmitting the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user.

83 ~~28~~. (New) The system of claim ~~27~~ 82, wherein the language processing logic includes speech recognition logic and an linguistic parsing logic for deriving linguistic information.

84 ~~29~~. (New) The system of claim ~~27~~ 82, wherein the language processing logic extracts an input template for an online scripted interface to the data source, and uses the input template to construct the navigation query.

85 ~~30~~. (New) The system of claim ~~29~~ 84, wherein the language processing logic dynamically scrapes the online scripted interface.

a3

86 ~~31~~. (New) The system of claim ~~27~~ 82, wherein the query construction logic constructs the query in the format of a database query language.

87 ~~32~~. (New) The system of claim ~~27~~ 82, wherein at least a portion of the language processing logic is hosted on a computing device located locally with the user, and wherein the portable microphone is electronically coupled to the local computing device.

88 ~~33~~. (New) The system of claim ~~27~~ 82, wherein at least a portion of the language processing logic is hosted on a network computing device located remotely from the user, and wherein the portable microphone sends data to the remote network computing device via the communications infrastructure.

89 ~~34~~. (New) The system of claim ~~27~~ 82, wherein the user interaction logic solicits additional input in response to one or more deficiencies encountered during construction of the navigation query.

90 ~~35~~. (New) The system of claim ~~34~~ 89, wherein the deficiencies include unresolved words of the spoken request.

P1.126

91 ~~36~~. (New) The system of claim ~~34~~ 82, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken request.

92 ~~37~~. (New) The system of claim ~~27~~ 82, wherein the user interaction logic solicits additional input in response to one or more deficiencies encountered after a first navigation of the data source performed by the navigation logic.

93 ~~38~~. (New) The system of claim ~~37~~ 92, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

94 ~~39~~. (New) The system of claim ~~37~~ 92, wherein the deficiencies include failure to identify . single data record within the data source responsive to the navigation query.

95 ~~40~~. (New) The system of claim ~~27~~ 82, wherein the user interaction logic displays an option menu.

a3

96 ~~41~~. (New) The system of claim ~~40~~ 95, wherein the act of selecting from the displayed option menu is performed by speaking.

97 ~~42~~. (New) The system of claim ~~27~~ 82, wherein the navigation logic selects the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken request.

98 ~~43~~. (New) The system of claim ~~27~~ 82, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

99 ~~44~~. (New) The system of claim ~~27~~ 82, wherein the display device receives data from the electronic data source on the network servers via a communications box.

100 ~~45~~. (New) The system of claim ~~27~~ 82, wherein the electronic communication infrastructure is a two-way infrastructure and is selected from among one or more of the following group: {coaxial cable, DSL, satellite, wireless/cellular, fiber-optic}.

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Sub C3

101 ~~46~~. (New) A computer program embodied on a computer readable medium for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising:

(a) a code segment that receives a spoken request for desired information from the user;

(b) a code segment that renders an interpretation of the spoken request;

(c) a code segment that constructs at least part of a navigation query based upon the interpretation;

(d) a code segment that solicits additional input from the user, including user interaction in a modality different than the original request;

(e) a code segment that refines the navigation query, based upon the additional input;

(f) a code segment that uses the refined navigation query to select a portion of the electronic data source; and

a3

(g) a code segment that transmits the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user.

102 ~~47~~. (New) The computer program of claim 101 ~~46~~, further comprising a code segment that derives linguistic information by using a speech recognition engine and a linguistic parser.

103 ~~48~~. (New) The computer program of claim 101 ~~46~~, further comprising a code segment that extract an input template for an online scripted interface to the data source, and a code segment that uses the input template to construct the navigation query.

104 ~~49~~. (New) The computer program of claim 103 ~~48~~, further comprising a code segment that dynamically scrapes the online scripted interface.

105 ~~50~~. (New) The computer program of claim 101 ~~46~~, wherein the navigation query is constructed in the format of a database query language.

R1.126

106 ~~51~~. (New) The computer program of claim 101 ~~46~~, wherein rendering of the interpretation and the construction of the navigation query are performed, at least in part, on a computing device located locally with the user.

107 ~~52~~. (New) The computer program of claim 101 ~~46~~, wherein the rendering of the interpretation and the construction of a navigation query are performed, at least in part, on a network computing device located remotely from the user.

108 ~~53~~. (New) The computer program of claim 101 ~~46~~, wherein code segment that solicits additional input solicits the additional input in response to one or more deficiencies encountered during the constructing of the navigation query.

109 ~~54~~. (New) The computer program of claim 108 ~~53~~, wherein the deficiencies include unresolved words of the spoken request.

a3

110 ~~55~~. (New) The computer program of claim 108 ~~53~~, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken request.

111 ~~56~~. (New) The computer program of claim 101 ~~46~~, wherein the code segment that solicits the additional input solicits the additional input in response to one or more deficiencies encountered after a first navigation of the data source.

112 ~~57~~. (New) The computer program of claim 111 ~~56~~, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

113 ~~58~~. (New) The computer program of claim 112 ~~57~~, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

114 ~~59~~. (New) The computer program of claim 101 ~~46~~, wherein code segment that solicits additional input displays an option menu.

115 ~~60~~. (New) The computer program of claim 114 ~~59~~, wherein the act of selecting from the displayed option menu is performed by speaking.

R1.126

116 ~~61~~. (New) The computer program of claim 101 ~~46~~, wherein the code segments of the computer program operate with respect to a plurality of simultaneous users and corresponding client devices.

117 ~~62~~. (New) The computer program of claim 101 ~~46~~, further comprising a code segment that selects the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken request.

118 ~~63~~. (New) The computer program of claim 101 ~~46~~, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

119 ~~64~~. (New) The computer program of claim 101 ~~46~~, wherein the additional input is solicited upon receiving a user-input statement that additional information is required.

120 ~~65~~. (New) The computer program of claim 101 ~~46~~, wherein the code segment that solicits the additional input includes a code segment that presents a menu to the user on the client device of the user.

121 ~~66~~. (New) The computer program of claim 101 ~~46~~, wherein the code segment that solicits the additional input includes a code segment that presents a textual request for the additional input.

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122 ~~67~~. (New) The computer program of claim 101 ~~46~~, wherein the code segment that solicits the additional input includes a code segment that produces an audible request for the additional input.

123 ~~68~~. (New) The computer program of claim 101 ~~46~~, wherein the code segment that solicits the additional input includes a code segment that presents a list of portions of the electronic data source that match the navigational query.

124 ~~69~~. (New) The computer program of claim 101 ~~46~~, wherein additional input received from the user is at least partially speech based.

125 ~~70~~. (New) The computer program of claim 101 ~~46~~, wherein additional input received from the user includes no spoken input.

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a3 R1,126 126

~~71~~. (New) The computer program of claim ~~46~~ 101, wherein code segments (d)-(e) are repeated until the navigational query is deemed adequate.

In the event a telephone conversation would expedite the prosecution of this application, the Examiner may reach the undersigned at (408) 505-5100. If any fees are due in connection with the filing of this paper, then the Commissioner is authorized to charge such fees to Deposit Account No. 50-1351 (Order No. SRI1P037A). A duplicate copy of the transmittal is enclosed for this purpose.

Respectfully submitted,

Kevin J. Zilka
Registration No. 41,429

P.O. Box 721030
San Jose, CA 95172
Telephone: (408) 505-5100

PATENT

03 Cat 4

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of)
Christine HALVERSEN et al.)
Application No. 09/524,095)
Filed: March 13, 2000)
For: NAVIGATING NETWORK BASED ELECTRONIC INFORMATION USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK)

OIPE JC147 JUL 05 2000 PATENT & TRADEMARK OFFICE

Docket: SRI1P037A

Date: June 30, 2000

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail to: Assistant Commissioner for Patents, Washington, DC 20231 on June 30, 2000.

Signed: ______________________
Kevin J. Zilka

Assistant Commissioner for Patents
Box Fee Amendment
Washington, DC 20231

Sir:

Transmitted herewith is an amendment in the above-identified application.

The fee has been calculated as shown below.

	Claims Remaining After Amendment		Highest Previously Paid For	Present Extra	SMALL ENTITY RATE FEE	OR	LARGE ENTITY RATE FEE	
TOTAL CLAIMS	71	-	55	16	X09 = $ 144	OR	X18 =	$
INDEP CLAIMS	3	-	3	0	X39 = $	OR	X78 =	$
[ ] Multiple Dependent Claim Present and Fee Not Previously Paid					$130			$260
				TOTAL	$ $144.00			$

- ☐ Applicant(s) hereby petition for a month extension of time to respond to the outstanding Office Action.
- ☐ Applicant(s) believe that no (additional) Extension of Time is required; however, if it is determined that such an extension is required, Applicant(s) hereby petition that such an extension be granted and authorize the Commissioner to charge the required fees for an Extension of Time under 37 CFR 1.136 to Deposit Account No. 50-1351.
- ☒ Enclosed is our Check No. 139 in the amount of $144.00 to cover the additional claim fee and/or extension of time fees.
- ☒ If the required fees are missing or any additional fees are required to facilitate filing the enclosed response, please charge such fees or credit any overpayment to Deposit Account No. 50-1351 (Order No. SRI1P037A).

Respectfully submitted,

Kevin J. Zilka
Registration No. 41,429

P.O. Box 721030
San Jose, CA 95172
Telephone: (408) 505-5100

(Revised 1/96)

OIPE JC38
JUL 26 2000
PATENT & TRADEMARK OFFICE

SECTOR #5

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Christine Halverson et al..	)	Group Art Unit: Unknown
Application No. 09/524,095	)	Examiner: Unknown
Filed: 3/13/00	)	Date: July 17, 2000
For: Navigating Network-Based Electronic Information Using Spoken Natural Language Input With Multimodal Error Feedback	)	

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Signed: [signature]
Kimberly Main

REQUEST FOR STATUS

Assistant Commissioner for Patents
Washington, D. C. 20231

Sir:

Applicant hereby requests status of the above-referenced patent application. This application was filed on March 13, 2000, and no Notice of Missing parts has been received as of this date.

Respectfully submitted

HICKMAN STEPHENS COLEMAN & HUGHES, LLP

[signature]
Raymond E. Roberts
Reg. No. 38,597

P.O. Box 52037
Palo Alto, CA 94303-0746
(408) 558-9950

Attorney Docket No. SRI1P037

GP 2758

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

#6 10/31/00

In re the application of:	)	
	)	Group Art Unit: Unknown
Christine Halverson	)	
	)	Examiner: Unknown
Application No.: Unassigned 09524095	)	
	)	Atty. Docket No.: SRI1P037
Filed: 3/13/2000	)	
	)	Date: May 23, 2000
For: Navigating Network-Based Electronic Information Using Spoken Natural Language Input with Multimodal Error Feedback	)	

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, DC 20231 on May 23, 2000.

Signed: Kimberly Main

Kimberly Main

INFORMATION DISCLOSURE STATEMENT UNDER 37 CFR §§ 1.56 AND 1.97(c)

Assistant Commissioner for Patents
Washington, DC 20231

Dear Sir:

The references listed in the attached PTO Form 1449, copies of which are attached, may be material to examination of the above-identified patent application. Applicants submit these references in compliance with their duty of disclosure pursuant to 37 CFR §§ 1.56 and 1.97. The Examiner is requested to make these references of official record in this application.

This Information Disclosure Statement is not to be construed as a representation that a search has been made, that additional information material to the examination of this application does not exist, or that these references indeed constitute prior art.

It is believed that no fees are due in connection with the filing of this Information Disclosure Statement. However, if it is determined that any fees are due, the Commissioner is hereby authorized to charge such fees to Deposit Account 50-0384 (Order No. SRI1P037).

Respectfully submitted,
HICKMAN STEPHENS COLEMAN & HUGHES, LLP

L. Keith Stephens
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Palo Alto, CA 94303-0746
Telephone: (408) 558-9950

Form 1449 (Modified) **Information Disclosure Statement By Applicant** (Use Several Sheets if Necessary)	Atty. Docket No. SRI1P037 Applicant: Christine Halverson Filing Date: 3/13/2000	Application No.: ~~Unassigned~~ 09 524095 Group ~~Art~~ Unit: ~~Unknown~~

RECEIVED JUN - 1 2000 TC 2700 MAIL ROOM

U.S. Patent Documents

Examiner Initial	No.	Patent No.	Date	Patentee	Class	Sub-class	Filing Date
F.B.	A	5,197,005	3/23/93	Schwartz et al.	364	419	
	B	5,386,556	1/31/95	Hedin et al.	395	600	
	C	5,434,777	7/18/95	Luciw	364	419	
	D	5,519,608	5/21/96	Kupiec	364	419.08	
	E	5,608,624	3/4/97	Luciw	395	794	
	F	5,721,938	2/24/98	Stuckey	395	754	
	G	5,729,659	3/17/98	Potter	395	2.79	
	H	5,748,974	5/5/98	Johnson	395	759	
	I	5,774,859	6/30/98	Houser et al.	704	275	
	J	5,794,050	8/11/98	Dahlgren et al.	395	708	
	K	5,802,526	9/1/98	Fawcett et al.	707	104	

O I P E MAY 2 6 2000 JC103 PATENT & TRADEMARK OFFICE

Foreign Patent or Published Foreign Patent Application

Examiner Initial	No.	Document No.	Publication Date	Country or Patent Office	Class	Sub-class	Translation Yes	Translation No
	L							
	M							
	N							
	O							
	P							

Other Documents

Examiner Initial	No.	Author, Title, Date, Place (e.g. Journal) of Publication
	R	
	S	
	T	

Examiner [signature]	Date Considered 4/6/01

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Form 1449 (Modified) **Information Disclosure Statement By Applicant** (Use Several Sheets if Necessary)	Atty. Docket No. SRI1P037 Applicant: Christine Halverson Filing Date: 3/13/2000	Application No.: ~~Unassigned~~ 09/524,545 Group Art Unit: Unknown

RECEIVED JUN - 1 2000 TC 2700 MAIL ROOM

U.S. Patent Documents

Examiner Initial	No.	Patent No.	Date	Patentee	Class	Sub-class	Filing Date
F.B	A	5,805,775	9/8/98	Eberman et al.	395	12	
	B	5,855,002	12/29/98	Armstrong	704	270	
	C	5,890,123	3/30/99	Brown et al.	704	275	
	D	5,963,940	10/5/99	Liddy et al.	707	5	
	E	6,003,072	12/14/99	Gerritsen et al.	709	218	
	F	6,012,030	1/4/00	French-St. George et al.	704	275	
	G	6,026,388	2/15/00	Liddy et al.	707	1	
	H						
	I						
	J						
	K						

OIPE JC103 MAY 2 6 2000 PATENT & TRADEMARK OFFICE

Foreign Patent or Published Foreign Patent Application

Examiner Initial	No.	Document No.	Publication Date	Country or Patent Office	Class	Sub-class	Translation Yes	Translation No
	L							
	M							
	N							
	O							
	P							

Other Documents

Examiner Initial	No.	Author, Title, Date, Place (e.g. Journal) of Publication
	R	
	S	

Examiner [signature]	Date Considered 4/6/01

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

JC530 U.S. PTO 09/524095 03/13/00

In re the application of:	)	
	)	Group Art Unit: Unknown
Christine Halverson	)	
	)	Examiner: Unknown
Application No.: Unassigned	)	
	)	Atty. Docket No.: SRI1P037
Filed: Herewith	)	
	)	Date: March 13, 2000
For: Navigating Network-Based Electronic Information Using Spoken Natural Language Input with Multimodal Error Feedback	)	

#7 IDS w/refs 10/31/00 dw

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, DC 20231 on March 13, 2000.

Signed: ______________________
Julie A. Curtis

INFORMATION DISCLOSURE STATEMENT UNDER 37 CFR §§ 1.56 AND 1.97(c)

Assistant Commissioner for Patents
Washington, DC 20231

Dear Sir:

The references listed in the attached PTO Form 1449, copies of which are attached, may be material to examination of the above-identified patent application. Applicants submit these references in compliance with their duty of disclosure pursuant to 37 CFR §§ 1.56 and 1.97. The Examiner is requested to make these references of official record in this application.

This Information Disclosure Statement is not to be construed as a representation that a search has been made, that additional information material to the examination of this application does not exist, or that these references indeed constitute prior art.

It is believed that no fees are due in connection with the filing of this Information Disclosure Statement. However, if it is determined that any fees are due, the Commissioner is hereby authorized to charge such fees to Deposit Account 50-0384 (Order No. SRI1P037).

Respectfully submitted,
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Form 1449 (Modified)	Atty. Docket No. SRI1P037	Application No.: ~~Unassigned~~ 09/824,045
Information Disclosure Statement By Applicant	Applicant: Christine Halverson	
(Use Several Sheets if Necessary)	Filing Date: Herewith	Group Art Unit: Unknown

U.S. Patent Documents

Examiner Initial	No.	Patent No.	Date	Patentee	Class	Sub-class	Filing Date
	A						
	B						
	C						
	D						
	E						
	F						
	G						
	H						
	I						
	J						
	K						

Foreign Patent or Published Foreign Patent Application

Examiner Initial	No.	Document No.	Publication Date	Country or Patent Office	Class	Sub-class	Translation Yes	Translation No
	L							
	M							
	N							
	O							
	P							

Other Documents

Examiner Initial	No.	Author, Title, Date, Place (e.g. Journal) of Publication
F.B	R	http://www.ai.sri.com/~lesaf/commandtalk.html: "CommandTalk: A Spoken-Language Interface for Battlefield Simulations", 1997, by Robert Moore, John Dowding, Harry Bratt, J. Mark Gawron, Yonael Gorfu and Adam Cheyer, in "Proceedings of the Fifth Conference on Applied Natural Language Processing", Washington, DC, pp. 1-7, Association for Computational Linguistics
F.B	S	"The CommandTalk Spoken Dialogue System", 1999, by Amanda Stent, John Dowding, Jean Mark Gawron, Elizabeth Owen Bratt and Robert Moore, in "Proceedings of the Thirty-Seventh Annual Meeting of the ACL", pp. 183-190, University of Maryland, College Park, MD, Association for Computational Linguistics

Examiner	Date Considered
[signature]	12/30/02

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

OIPE
SEP 20 2000
PATENT & TRADEMARK OFFICE

#7/a/B

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

203 X 55

RECEIVED
APR 12 2001
Technology Center 2100

In re the application of Christine HALVERSEN et al. Application No. 09/524,095 Filed: March 13, 2000 For: NAVIGATING NETWORK BASED ELECTRONIC INFORMATION USING SPOKEN INPUT WITH MULTIMODAL ERROR FEEDBACK	Docket: SRI1P037A Date: September 12, 2000

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, DC 20231 on September 12, 2000.

Signed: ________________
Kevin J. Zilka

09/22/2000 EFLORES 00000035 09524095

01 FC:203 495.00 OP
02 FC:202 117.00 OP

Preliminary Amendment B

Assistant Commissioner for Patents
and Trademarks
Washington, DC 20231

Dear Sir:

Please supplement the Preliminary Amendment filed June 30, 2000 regarding the above-identified patent application by entering the following amendments.

IN THE CLAIMS:

Please re-insert the originally filed claims as new claims 72-126. Pending claims 1-71 added in the previous Preliminary Amendment have been included for reference purposes. All currently pending claims are thus represented below.

1. A method for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising the steps of:

(a) receiving a spoken request for desired information from the user;

(b) rendering an interpretation of the spoken request;

(c) constructing at least part of a navigation query based upon the interpretation;

(d) soliciting additional input from the user, including user interaction in a modality different than the original request;

(e) refining the navigation query, based upon the additional input;

(f) using the refined navigation query to select a portion of the electronic data source; and

(g) transmitting the selected portion of the electronic data source from the network server to a client device of the user.

2. The method of claim 1, wherein the step of rendering an interpretation further includes deriving linguistic information by using a speech recognition engine and a linguistic parser.

3. The method of claim 1, wherein the step of constructing a navigation query further includes the steps of extracting an input template for an online scripted interface to the data source, and using the input template to construct the navigation query.

4. The method of claim 3, wherein the step of extracting an input template includes dynamically scraping the online scripted interface.

5. The method of claim 1, wherein the navigation query is constructed in the format of a database query language.

6. The method of claim 1, wherein the step of rendering an interpretation and the step of constructing a navigation query are performed, at least in part, on a computing device located locally with the user.

7. The method of claim 1, wherein the step of rendering an interpretation and the step of constructing a navigation query are performed, at least in part, on a network computing device located remotely from the user.

8. The method of claim 1, wherein the step of soliciting additional input is performed in response to one or more deficiencies encountered during the step of constructing a navigation query.

9. The method of claim 8, wherein the deficiencies include unresolved words of the spoken request.

10. The method of claim 8, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken request.

11. The method of claim 1, wherein the step of soliciting additional input is performed in response to one or more deficiencies encountered after a first navigation of the data source using the navigation query constructed in step (c).

12. The method of claim 11, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

13. The method of claim 11, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

14. The method of claim 1, wherein the additional input is solicited upon receiving a user-input statement that additional information is required.

15. The method of claim 1, wherein the step of soliciting the additional input includes presenting a menu to the user on the client device of the user.

16. The method of claim 1, wherein the step of soliciting the additional input includes presenting a textual request for the additional input.

17. The method of claim 1, wherein the step of soliciting the additional input includes an audible request for the additional input.

18. The method of claim 1, wherein the step of soliciting the additional input includes presenting a list of portions of the electronic data source that match the navigational query.

19. The method of claim 1, wherein additional input received from the user is at least partially speech based.

20. The method of claim 1, wherein additional input received from the user includes no spoken input.

21. The method of claim 1, wherein steps (d)-(e) are repeated until the navigational query is deemed adequate.

22. The method of claim 1, wherein the input modality of step (d) includes selecting from a displayed option menu.

23. The method of claim 22, wherein the act of selecting from the displayed option menu is performed by speaking.

24. The method of claim 1, wherein the method is performed with respect to a plurality of simultaneous users and corresponding client devices.

25. The method of claim 1, further including the step of selecting the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken request.

26. The method of claim 1, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

27. A system for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, the system comprising:

(a) a portable microphone operable to receive a spoken request for desired information from the user;

(b) language processing logic, operable to render an interpretation of the spoken request;

(c) query construction logic, operable to construct a navigation query in response to the interpretation of the spoken request;

(d) user interaction logic, operable to solicit additional input from the user, including user interaction in a modality different than the original request;

(e) query refining logic, operable to refine the navigation query, based upon the additional input;

(f) navigation logic, operable to select a portion of the electronic data source using the navigation query; and

(g) electronic communications infrastructure for transmitting the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user.

28. The system of claim 27, wherein the language processing logic includes speech recognition logic and an linguistic parsing logic for deriving linguistic information.

29. The system of claim 27, wherein the language processing logic extracts an input template for an online scripted interface to the data source, and uses the input template to construct the navigation query.

30. The system of claim 29, wherein the language processing logic dynamically scrapes the online scripted interface.

31. The system of claim 27, wherein the query construction logic constructs the query in the format of a database query language.

32. The system of claim 27, wherein at least a portion of the language processing logic is hosted on a computing device located locally with the user, and wherein the portable microphone is electronically coupled to the local computing device.

33. The system of claim 27, wherein at least a portion of the language processing logic is hosted on a network computing device located remotely from the user, and wherein the portable microphone sends data to the remote network computing device via the communications infrastructure.

34. The system of claim 27, wherein the user interaction logic solicits additional input in response to one or more deficiencies encountered during construction of the navigation query.

35. The system of claim 34, wherein the deficiencies include unresolved words of the spoken request.

36. The system of claim 34, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken request.

37. The system of claim 27, wherein the user interaction logic solicits additional input in response to one or more deficiencies encountered after a first navigation of the data source performed by the navigation logic.

38. The system of claim 37, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

39. The system of claim 37, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

40. The system of claim 27, wherein the user interaction logic displays an option menu.

41. The system of claim 40, wherein the act of selecting from the displayed option menu is performed by speaking.

42. The system of claim 27, wherein the navigation logic selects the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken request.

43. The system of claim 27, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

44. The system of claim 27, wherein the display device receives data from the electronic data source on the network servers via a communications box.

45. The system of claim 27, wherein the electronic communication infrastructure is a two-way infrastructure and is selected from among one or more of the following group: {coaxial cable, DSL, satellite, wireless/cellular, fiber-optic}.

46. A computer program embodied on a computer readable medium for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising:

(a) a code segment that receives a spoken request for desired information from the user;

(b) a code segment that renders an interpretation of the spoken request;

(c) a code segment that constructs at least part of a navigation query based upon the interpretation;

(d) a code segment that solicits additional input from the user, including user interaction in a modality different than the original request;

(e) a code segment that refines the navigation query, based upon the additional input;

(f) a code segment that uses the refined navigation query to select a portion of the electronic data source; and

(g) a code segment that transmits the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user.

47. The computer program of claim 46, further comprising a code segment that derives linguistic information by using a speech recognition engine and a linguistic parser.

48. The computer program of claim 46, further comprising a code segment that extract an input template for an online scripted interface to the data source, and a code segment that uses the input template to construct the navigation query.

49. The computer program of claim 48, further comprising a code segment that dynamically scrapes the online scripted interface.

50. The computer program of claim 46, wherein the navigation query is constructed in the format of a database query language.

51. The computer program of claim 46, wherein rendering of the interpretation and the construction of the navigation query are performed, at least in part, on a computing device located locally with the user.

52. The computer program of claim 46, wherein the rendering of the interpretation and the construction of a navigation query are performed, at least in part, on a network computing device located remotely from the user.

53. The computer program of claim 46, wherein code segment that solicits additional input solicits the additional input in response to one or more deficiencies encountered during the constructing of the navigation query.

54. The computer program of claim 53, wherein the deficiencies include unresolved words of the spoken request.

55. The computer program of claim 53, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken request.

56. The computer program of claim 46, wherein the code segment that solicits the additional input solicits the additional input in response to one or more deficiencies encountered after a first navigation of the data source.

57. The computer program of claim 56, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

58. The computer program of claim 57, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

59. The computer program of claim 46, wherein code segment that solicits additional input displays an option menu.

60. The computer program of claim 59, wherein the act of selecting from the displayed option menu is performed by speaking.

61. The computer program of claim 46, wherein the code segments of the computer program operate with respect to a plurality of simultaneous users and corresponding client devices.

62. The computer program of claim 46, further comprising a code segment that selects the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken request.

63. The computer program of claim 46, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

64. The computer program of claim 46, wherein the additional input is solicited upon receiving a user-input statement that additional information is required.

65. The computer program of claim 46, wherein the code segment that solicits the additional input includes a code segment that presents a menu to the user on the client device of the user.

66. The computer program of claim 46, wherein the code segment that solicits the additional input includes a code segment that presents a textual request for the additional input.

67. The computer program of claim 46, wherein the code segment that solicits the additional input includes a code segment that produces an audible request for the additional input.

68. The computer program of claim 46, wherein the code segment that solicits the additional input includes a code segment that presents a list of portions of the electronic data source that match the navigational query.

69. The computer program of claim 46, wherein additional input received from the user is at least partially speech based.

70. The computer program of claim 46, wherein additional input received from the user includes no spoken input.

71. The computer program of claim 46, wherein code segments (d)-(e) are repeated until the navigational query is deemed adequate.

---

127 ~~72~~. (New) A method for utilizing spoken natural language for navigating an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising the steps of:

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(a) receiving a spoken natural language ("NL") request for desired information from the user;

(b) rendering an interpretation of the spoken natural language request;

(c) constructing at least part of a navigation query based upon the interpretation;

(d) soliciting additional input from the user, including user interaction in a modality different than the original request;

(e) refining the navigation query, based upon the additional input;

(f) using the refined navigation query to select a portion of the electronic data source; and

(g) transmitting the selected portion of the electronic data source from the network server to a client device of the user.

128 ~~73~~. (New) The method of claim 127 ~~72~~, wherein the step of rendering an interpretation further includes deriving linguistic information by using a speech recognition engine and an NL parser.

129 ~~74~~. (New) The method of claim 127 ~~72~~, wherein the step of constructing a navigation query further includes the steps of extracting an input template for an online scripted interface to the data source, and using the input template to construct the navigation query.

B'

130 ~~75~~. (New) The method of claim 129 ~~74~~, wherein the step of extracting an input template includes dynamically scraping the online scripted interface.

131 ~~76~~. (New) The method of claim 127 ~~72~~, wherein the navigation query is constructed in the format of a database query language.

132 ~~77~~. (New) The method of claim 127 ~~72~~, wherein the step of rendering an interpretation and the step of constructing a navigation query are performed, at least in part, on a computing device located locally with the user.

133 ~~78~~. (New) The method of claim 127 ~~72~~, wherein the step of rendering an interpretation and the step of constructing a navigation query are performed, at least in part, on a network computing device located remotely from the user.

134 ~~79~~. (New) The method of claim 127 ~~72~~, wherein the step of soliciting additional input is performed in response to one or more deficiencies encountered during the step of constructing a navigation query.

~~80~~ 135. (New) The method of claim ~~79~~ 134, wherein the deficiencies include unresolved words of the spoken NL request.

~~81~~ 136. (New) The method of claim ~~79~~ 134, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken NL request.

~~82~~ 137. (New) The method of claim ~~72~~ 127, wherein the step of soliciting additional input is performed in response to one or more deficiencies encountered after a first navigation of the data source using the navigation query constructed in step (c).

~~83~~ 138. (New) The method of claim ~~82~~ 137, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

~~84~~ 139. (New) The method of claim ~~82~~ 137, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

~~85~~ 140. (New) The method of claim ~~72~~ 127, wherein the input modality of step (d) includes selecting from a displayed option menu.

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~~86~~ 141. (New) The method of claim ~~85~~ 140, wherein the act of selecting from the displayed option menu is performed by speaking.

~~87~~ 142. (New) The method of claim ~~72~~ 127, wherein the method is performed with respect to a plurality of simultaneous users and corresponding client devices.

~~88~~ 143. (New) The method of claim ~~72~~ 127, further including the step of selecting the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken NL request.

~~89~~ 144. (New) The method of claim ~~72~~ 127, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

~~90~~ 145. (New) A system for utilizing spoken natural language to navigate an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, the system comprising:

(a) a portable microphone operable to receive a spoken natural language ("NL") request for desired information from the user;

(b) spoken language processing logic, operable to render an interpretation of the spoken natural language request;

(c) query construction logic, operable to construct a navigation query in response to the interpretation of the spoken natural language request;

(d) user interaction logic, operable to solicit additional input from the user, including user interaction in a modality different than the original request;

(e) query refining logic, operable to refine the navigation query, based upon the additional input;

(f) navigation logic, operable to select a portion of the electronic data source using the navigation query; and

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(g) electronic communications infrastructure for transmitting the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user.

146 ~~91~~. (New) The system of claim 145 ~~90~~, wherein the spoken language processing logic includes speech recognition logic and an NL parsing logic for deriving linguistic information.

147 ~~92~~. (New) The system of claim 145 ~~90~~, wherein the spoken language processing logic extracts an input template for an online scripted interface to the data source, and uses the input template to construct the navigation query.

148 ~~93~~. (New) The system of claim 147 ~~92~~, wherein the spoken language processing logic dynamically scrapes the online scripted interface.

149 ~~94~~. (New) The system of claim 145 ~~90~~, wherein the query construction logic constructs the query in the format of a database query language.

150 ~~95~~. (New) The system of claim 145 ~~90~~, wherein at least a portion of the spoken language processing logic is hosted on a computing device located locally with the user, and wherein the portable microphone is electronically coupled to the local computing device.

151 ~~96~~. (New) The system of claim 145 ~~90~~, wherein at least a portion of the spoken language processing logic is hosted on a network computing device located remotely from the user, and wherein the portable microphone sends data to the remote network computing device via the communications infrastructure.

152 ~~97~~. (New) The system of claim 145 ~~90~~, wherein the user interaction logic solicits additional input in response to one or more deficiencies encountered during construction of the navigation query.

153 ~~98~~. (New) The system of claim 97, wherein the deficiencies include unresolved words of the spoken NL request.

154 ~~99~~. (New) The system of claim 97, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken NL request.

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155 ~~100~~. (New) The system of claim 145 ~~90~~, wherein the user interaction logic solicits additional input in response to one or more deficiencies encountered after a first navigation of the data source performed by the navigation logic.

156 ~~101~~. (New) The system of claim ~~100~~, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

157 ~~102~~. (New) The system of claim ~~100~~, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

158 ~~103~~. (New) The system of claim 145 ~~90~~, wherein the user interaction logic displays an option menu.

159 ~~104~~. (New) The system of claim ~~103~~, wherein the act of selecting from the displayed option menu is performed by speaking.

160 ~~105~~. (New) The system of claim 145 ~~90~~, wherein the navigation logic selects the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken NL request.

161 ~~106~~. (New) The system of claim 145 ~~90~~, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

162 ~~107~~. (New) The system of claim 145 ~~90~~, wherein the display device receives data from the electronic data source on the network servers via a communications box.

163 ~~108~~. (New) The system of claim 145 ~~90~~, wherein the electronic communication infrastructure is a two-way infrastructure and is selected from among one or more of the following group: {coaxial cable, DSL, satellite, wireless/cellular, fiber-optic}.

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164 ~~109~~. (New) A computer program embodied on a computer readable medium for utilizing spoken natural language for navigating an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising:

(a) a code segment that receives a spoken natural language ("NL") request for desired information from the user;

(b) a code segment that renders an interpretation of the spoken natural language request;

(c) a code segment that constructs at least part of a navigation query based upon the interpretation;

(d) a code segment that solicits additional input from the user, including user interaction in a modality different than the original request;

(e) a code segment that refines the navigation query, based upon the additional input;

(f) a code segment that uses the refined navigation query to select a portion of the electronic data source; and

(g) a code segment that transmits the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user.

165 ~~110~~. (New) The computer program of claim 164 ~~109~~, further comprising a code segment that derives linguistic information by using a speech recognition engine and an NL parser.

166 ~~111~~. (New) The computer program of claim 164 ~~109~~, further comprising a code segment that extract an input template for an online scripted interface to the data source, and a code segment that uses the input template to construct the navigation query.

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167 ~~112~~. (New) The computer program of claim 166 ~~111~~, further comprising a code segment that dynamically scrapes the online scripted interface.

168 ~~113~~. (New) The computer program of claim 164 ~~109~~, wherein the navigation query is constructed in the format of a database query language.

169 ~~114~~. (New) The computer program of claim 164 ~~109~~, wherein rendering of the interpretation and the construction of the navigation query are performed, at least in part, on a computing device located locally with the user.

170 ~~115~~. (New) The computer program of claim 164 ~~109~~, wherein the rendering of the interpretation and the construction of a navigation query are performed, at least in part, on a network computing device located remotely from the user.

171 ~~116~~. (New) The computer program of claim 164 ~~109~~, wherein code segment that solicits additional input solicits the additional input in response to one or more deficiencies encountered during the constructing of the navigation query.

172 ~~117~~. (New) The computer program of claim 171 ~~116~~, wherein the deficiencies include unresolved words of the spoken NL request.

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~~118~~ 173. (New) The computer program of claim ~~116~~ 171, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken NL request.

~~119~~ 174. (New) The computer program of claim ~~109~~ 164, wherein the code segment that solicits the additional input solicits the additional input in response to one or more deficiencies encountered after a first navigation of the data source.

~~120~~ 175. (New) The computer program of claim ~~119~~ 174, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

~~121~~ 176. (New) The computer program of claim ~~119~~ 174, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

~~122~~ 177. (New) The computer program of claim ~~109~~ 164, wherein code segment that solicits additional input displays an option menu.

~~123~~ 178. (New) The computer program of claim ~~122~~ 177, wherein the act of selecting from the displayed option menu is performed by speaking.

~~124~~ 179. (New) The computer program of claim ~~109~~ 164, wherein the code segments of the computer program operate with respect to a plurality of simultaneous users and corresponding client devices.

~~125~~ 180. (New) The computer program of claim ~~109~~ 164, further comprising a code segment that selects the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken NL request.

~~126~~ 181. (New) The computer program of claim ~~109~~ 164, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

REMARKS

In the event a telephone conversation would expedite the prosecution of this application, the Examiner may reach the undersigned at (408) 505-5100. If any fees are due in connection with the filing of this paper, then the Commissioner is authorized to charge such fees to Deposit Account No. 50-1351 (Order No. SRI1P037A).

Respectfully submitted,

Kevin J. Zilka
Registration No. 41,429
SILICON VALLEY IP LAW GROUP

P.O. Box 721030
San Jose, CA 95172
Telephone: (408) 505-5100

PATENT ~~B~~ 2155

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APR 12 2001

Technology Center 2100

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

OIPE JC147 SEP 20 2000 PATENT & TRADEMARK OFFICE

In re the application of

Christine HALVERSEN et al.

Application No. 09/524,095

Filed: March 13, 2000

For: NAVIGATING NETWORK BASED ELECTRONIC INFORMATION USING SPOKEN INPUT WITH MULTIMODAL ERROR FEEDBACK

Docket: SRI1P037A

Date: September 12, 2000

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail to: Assistant Commissioner for Patents, Washington, DC 20231 on September 12, 2000.

Signed: ______________________

Kevin J. Zilka

Match & Return

Assistant Commissioner for Patents
Box Fee Amendment
Washington, DC 20231

Sir:

Transmitted herewith is an amendment in the above-identified application.

The fee has been calculated as shown below.

	Claims Remaining After Amendment		Highest Previously Paid For	Present Extra	SMALL ENTITY RATE FEE	OR	LARGE ENTITY RATE FEE
TOTAL CLAIMS	126	-	71	55	X09 = $ 495.00 OR	X18 =	$ = 203 × 55
INDEP CLAIMS	6	-	3	3	X39 = $ 117.00 OR	X78 =	202 × 3 $
[ ] Multiple Dependent Claim Present and Fee Not Previously Paid					$130		$260
				TOTAL	$ $612.00		$______

☐ Applicant(s) hereby petition for a month extension of time to respond to the outstanding Office Action.

☐ Applicant(s) believe that no (additional) Extension of Time is required; however, if it is determined that such an extension is required, Applicant(s) hereby petition that such an extension be granted and authorize the Commissioner to charge the required fees for an Extension of Time under 37 CFR 1.136 to Deposit Account No. 50-1351.

☒ Enclosed is our Check No. 192 in the amount of $612.00 to cover the additional claim fee and/or extension of time fees.

☒ If the required fees are missing or any additional fees are required to facilitate filing the enclosed response, please charge such fees or credit any overpayment to Deposit Account No. 50-1351 (Order No. SRI1P037A).

Respectfully submitted,

Kevin J. Zilka
Registration No. 41,429

P.O. Box 721030
San Jose, CA 95172
Telephone: (408) 505-5100

(Revised 1/96)

Attorney Docket No.: SRI1P037A (US4116-3)

#8
LDJ
12-10-00

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

OIPE
DEC 04 2000
PATENT & TRADEMARK OFFICE JC17

APPLICATION SERIAL NO.:	09/524,095
INVENTOR:	Christine Halverson
ASSIGNEE:	SRI International
TITLE:	Navigating Network-Based Electronic Information Using Spoken Natural Language Input With Multimodal Error Feedback
FILING DATE:	March 13, 2000

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DEC 08 2000
Technology Center 2100

REVOCATION AND POWER OF ATTORNEY

Assistant Commissioner for Patents
Washington, DC 20231

The undersigned assignee of the above-referenced patent application hereby revokes all prior powers of attorney and appoints as his attorney, with full powers of substitution and revocation, to transact all business in the Patent and Trademark Office connected with this application and any patent resulting therefrom, the following:

L. Keith Stephens, Reg. No. 32,632
C. Douglas McDonald, Reg. No. 26,659
John C. Clark, Reg. No. 43,552

Please direct all future communications and telephone calls to:

L. Keith Stephens
CARLTON, FIELDS, WARD, EMMANUEL, SMITH & CUTLER, P.A.
P.O. Box 3239
Tampa, FL 33601-3239
(813) 223-7000

SRI INTERNATIONAL

Date: 11/20/00

By: [signature]
Edward E. Davis, Assistant Secretary

TPA#1650948.01

2155

CARLTON FIELDS

ATTORNEYS AT LAW

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O I P E
DEC 04 2000
JC17
PATENT & TRADEMARK OFFICE

November 27, 2000

RECEIVED
DEC 08 2000
Technology Center 2100

Assistant Commissioner for Patents
Washington, DC 20231

Re:	Patent Application Serial No.:	09/524,095
	Inventor:	Douglas E. Appelt, et al.
	Title:	Navigating Network-Based Electronic Information Using Spoken Natural Language Input with Multimodal Error Feedback
	Filed:	March 13, 2000
	Our File No.:	44454/02742

Dear Sir:

Please enter the enclosed Revocation and Power of Attorney into the file of the referenced application.

Very truly yours,

L. Keith Stephens, Reg. No. 32,632

CDM/cm
Enclosure
cc: Edward E. Davis, Asst. Secretary (w/o encl.)

CERTIFICATE OF MAILING

I do hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail, postage prepaid, in an envelope addressed to Assistant Commissioner for Patents, Washington, DC 20231, on the date set forth below.

Cynthia Mejias

11/27/00
Date

#8

UNITED STATES PATENT AND TRADEMARK OFFICE

COMMISSIONER FOR PATENTS
UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. 20231
www.uspto.gov

APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/524,095	03/13/2000	Christine Halverson	SRI1P037

24277
Kevin J. Zilka
PO Box 721030
San Jose, CA 95172

OC000000005610555

Date Mailed: 12/11/2000

NOTICE REGARDING POWER OF ATTORNEY

This is in response to the Power of Attorney filed 12/04/2000.

- The Power of Attorney to you in this application has been revoked by the applicant. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

Karima Johnson
Customer Service Center
Initial Patent Examination Division (703) 308-1202

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#9

UNITED STATES PATENT AND TRADEMARK OFFICE

COMMISSIONER FOR PATENTS
UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. 20231
www.uspto.gov

APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/524,095	03/13/2000	Christine Halverson	SRI1P037

OC000000005610560
OC000000005610560

I. KEITH STEPHENS
CARLTON, FIELDS, WARD, EMMANUEL, SMITH & CUTLER
P.O. BOX 3239
TAMPA, FL 33601-3239

Date Mailed: 12/11/2000

NOTICE REGARDING POWER OF ATTORNEY

This is in response to the Power of Attorney filed 12/04/2000.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Laurina Johnson
Customer Service Center
Initial Patent Examination Division (703) 308-1202

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UNITED ST. S DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/524,095	03/13/00	HALVERSON C	SRI1P037

TM02/0424

L. KEITH STEPHENS
CARLTON, FIELDS, WARD, EMMANUEL, SMITH &
P.O. BOX 3239
TAMPA FL 33601-3239

EXAMINER	
BACKER, F	
ART UNIT	PAPER NUMBER
2155	10

DATE MAILED: 04/24/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

PTO-90C (Rev.11/00)

1- File Copy

Office Action Summary	Application No.	Applicant(s)
	09/524,095	HALVERSON ET AL.
	Examiner	**Art Unit**
	Firmin Backer	2155

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 13 March 2000.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 56-126 is/are pending in the application.

4a) Of the above claim(s) ____ is/are withdrawn from consideration.

5)☐ Claim(s) ____ is/are allowed.

6)☒ Claim(s) 56-126 is/are rejected.

7)☐ Claim(s) ____ is/are objected to.

8)☐ Claims ____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on ____ is/are objected to by the Examiner.

11)☐ The proposed drawing correction filed on ____ is: a)☐ approved b)☐ disapproved.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. ____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) ☒ Notice of References Cited (PTO-892)
16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ .
18) ☐ Interview Summary (PTO-413) Paper No(s). ____ .
19) ☐ Notice of Informal Patent Application (PTO-152)
20) ☐ Other:

DETAILED ACTION

This is in response to a letter for patent filed on June 30th, 2000 in which claims 56-126 are presented for examination. Claims 56-126 are pending in the letter.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claims 56-126 are rejected under 35 U.S.C. 102(e) as being anticipated by Levin et al. (U.S. Patent No. 6,173,279).

3. As per claim 56, Levin et al teach a method for speech-based navigation (information server, 110) of an electronic data source located at one or more network servers located remotely from a user, (see abstract, fig 1, column 3 lines 5-35), comprising receiving a spoken request (*receive a natural language query*) for desired information from the user (user); rendering an interpretation (*creating a semantic representation*) of the spoken request, constructing a navigation (*generating search)* query based upon the interpretation; soliciting additional input from the user (*one or more questions are generated...*), including user interaction in a modality different that the original request and, refining the navigation query, based upon the additional

input (see column 6 lines 20-59), using the navigation query to select a portion of the electronic data source; and transmitting the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user. (see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22)

4. As per claim 57, Levin et al teach a method of rendering the interpretation includes deriving linguistic information by using a speech recognition and a linguistic parser (see abstract, fig 1, column 3 lines 37-5 lines 40).

5. As per claim 58-62, Levin et al teach a method of constructing a navigation query in the form of a database query on a computing device located on a network including extracting an input template for an online scripted interface to the data source to be used for the construction of the navigation query and dynamically scraping the online scripted interface (see abstract, fig. 1-3, column 3 line 36-9 line 5)

6. As per claim 63-68, Levin et al teach a method of soliciting additional input is performed in response deficiency including unresolved word encountered after the first navigation of the data source, required element of the navigational query, data recorded within the data source, failure to identify data record responsive to navigational query (see column 6 lines 20-59).

7. As per claim 69, Levin et al teach a method wherein the additional input is solicited upon receiving a user-input statement...(see column 6 lines 20-59).

8. As per claim 70-73, Levin et al teach a method of soliciting additional input from the user, including presenting: a menu, a textual or an audible request, a list of portions of data source (see abstract, fig. 1-3; column 3 line 36-9 line 5).

9. As per claim 74-75, Levin et al teach a method wherein additional input received from the user is speech based, of no spoken input source (see abstract, fig. 1-3, column 3 line 36-9 line 5).

10. As per claim 76, Levin et al teach a method wherein steps (d)-(e) are repeated until the navigational query if deemed adequate source (see abstract, fig. 1-3, column 3 line 36-9 line 5).

11. As per claim 77, 78, Levin et al teach a method wherein the input modality includes selecting (by speaking) from a displayed option menu (see abstract, fig. 1-3, column 3 line 36-9 line 5).

12. As per claim 79, Levin et al teach a method performed with respect to a plurality of user and corresponding client devices (see abstract, fig. 1-3, column 3 line 36-9 line 5).

13. As per claim 80-81, Levin et al teach a method of selecting data source from plurality of electronic data source storing multimedia content including audio and video content (see abstract, fig. 1-3, column 3 line 36-9 line 5)

14. As per claim 82, Levin et al teach a system for speech-based navigation (*information server, 110*) of an electronic data source located at one or more network servers located remotely from a user, (see abstract, fig 1, column 3 lines 5-35), comprising a portable microphone (*microphone, 105*) receiving a spoken request (*receive a natural language query*) for desired information from the user (user) a language processing logic (*natural language server, 114*) rendering an interpretation (*creating a semantic representation*) of the spoken request, (see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22) a query construction logic (*service host, 112*) constructing a navigation (*generating search)* query based upon the interpretation; a query interaction logic (*service host, 112)* soliciting additional input from the user (*one or more questions are generated...*), including user interaction in a modality different that the original request and, (see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22), a query refining logic (*service host, 112)* refining the navigation query, based upon the additional input (see column 6 lines 20-59), a navigation logic (*service host, 112)* using the navigation query to select a portion of the electronic data source; electronic infrastructure (*network, 108*) transmitting the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user. (see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22).

15. As per claim 83, Levin et al teach a system of rendering the interpretation includes deriving linguistic information by using a speech recognition and a linguistic parser (see abstract, fig 1, column 3 lines 37-5 lines 40).

16. As per claim 84-86, Levin et al teach a system of constructing a navigation query in the form of a database query on a computing device located on a network including extracting an input template for an online scripted interface to the data source to be used for the construction of the navigation query and dynamically scraping the online scripted interface (see abstract, fig. 1-3, column 3 line 36-9 line 5).

17. As per claim 87, 88, 100, Levin et al teach a system wherein at least a portion of the language processing if hosted on a computing device coupled with a microphone located locally with a user and a network computing device located remotely and data in a two-way communication infrastructure (coaxial, DSL, satellite, wireless/cellular, fiber-optic) (see abstract, fig. 1-3, column 3 line 36-9 line 5).

18. As per claim 89-94, Levin et al teach a system of soliciting additional input is performed in response deficiency including unresolved word encountered after the first navigation of the data source, required element of the navigational query, data recorded within the data source, failure to identify data record responsive to navigational query (see column 6 lines 20-59).

19. As per claim 95, 96, Levin et al teach a system wherein the input modality includes selecting (by speaking) from a displayed option menu (see abstract, fig. 1-3, column 3 line 36-9 line 5).

20. As per claim 97-98, Levin et al teach a system of selecting data source from plurality of electronic data source storing multimedia content including audio and video content (see abstract, fig. 1-3, column 3 line 36-9 line 5).

21. As per claim 99, Levin et al teach a system wherein the display device receives data from the electronic device on the network via a communication box (see abstract, fig. 1-3, column 3 line 36-9 line 5).

22. As per claim 101, Levin et al teach a computer program for speech-based navigation (information server, 110) of an electronic data source located at one or more network servers located remotely from a user, (see abstract, fig 1, column 3 lines 5-35), comprising code segment receiving a spoken request (*receive a natural language query*) for desired information from the user (user); code segment rendering an interpretation (*creating a semantic representation*) of the spoken request, code segment constructing a navigation (*generating search)* query based upon the interpretation; soliciting additional input from the user (*one or more questions are generated...*), including user interaction in a modality different that the original request and, code segment refining the navigation query, based upon the additional input (see column 6 lines 20-59), code segment using the navigation query to select a portion of the electronic data source; and code segment transmitting the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user (see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22).

23. As per claim 102, Levin et al teach a code segment deriving linguistic information by using a speech recognition and a linguistic parser (see abstract, fig 1, column 3 lines 37-5 lines 40).

24. As per claim 103-105, Levin et al teach a code segment of constructing a navigation query in the form of a database query on a computing device located on a network including extracting an input template for an online scripted interface to the data source to be used for the construction of the navigation query and dynamically scraping the online scripted interface (see abstract, fig. 1-3, column 3 line 36-9 line 5).

25. As per claim 106-107, Levin et al teach a computer program wherein rendering of the interpretation and the construction of the navigation query are performed on a computing device located locally with or remotely from the user (see abstract, fig. 1-3, column 3 line 36-9 line 5).

26. As per claim 108-114, Levin et al teach a code segment that solicits additional input display on option menu is performed by speaking in response deficiency including unresolved word encountered after the first navigation of the data source, required element of the navigational query, data recorded within the data source, failure to identify data record responsive to navigational query (see column 6 lines 20-59).

27. As per claim 115, Levin et al teach a computer program the act of selecting from the display is performed by speaking (see column 6 lines 20-59)

28. As per claim 116, Levin et al teach a code segment of the computer program operate with respect to a plurality of simultaneous user and corresponding client devices (see abstract, fig. 1-3, column 3 line 36-9 line 5).

29. As per claim 117, Levin et al teach a code segment that select data source form a plurality of electronic data source .... content (see abstract, fig. 1-3, column 3 line 36-9 line 5).

30. As per claim 118, Levin et al teach a computer program of selecting data source from plurality of electronic data source storing multimedia content including audio and video content (see abstract, fig. 1-3, column 3 line 36-9 line 5).

31. As per claim 119, Levin et al teach a computer program wherein the additional input is solicited upon receiving a user-input statement...(see column 6 lines 20-59).

32. As per claim 120-123, Levin et al teach a code segment of soliciting additional input from the user, including presenting: a menu, a textual or an audible request, a list of portions of data source (see abstract, fig. 1-3, column 3 line 36-9 line 5).

33. As per claim 124-125, Levin et al teach a computer program wherein additional input received from the user is speech based, of no spoken input source (see abstract, fig. 1-3, column 3 line 36-9 line 5).

As per claim 126, Levin et al teach a code segment wherein steps (d)-(e) are repeated until the navigational query if deemed adequate source (see abstract, fig. 1-3, column 3 line 36-9 line 5).

Conclusion

34. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. (6,192,338).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Firmin Backer whose telephone number is 703-305-0624. The examiner can normally be reached on Mon-Thu 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sheikh Ayaz can be reached on 703-305-9648. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3718 for regular communications and 703-305-5352 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Firmin Backer
Firmin Backer
April 9, 2001

FORM PTO-892	U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	SERIAL NO. 09/524,095	GROUP ART UNIT 2781	ATTACHMENT TO PAPER NO.	10
NOTICE OF REFERENCES CITED		APPLICANT(S) HALVERSON ET AL.			

U.S. PATENT DOCUMENTS

*		DOCUMENT NO.	DATE	NAME	CLASS	SUB-CLASS	FILING DATE
	A	6,192,338	2/2001	Zasto et al	704	257	
	B	6,173,279	1/2001	Levin et al.	707	5	
	C						
	D						
	E						
	F						
	G						
	H						
	I						
	J						
	K						

FOREIGN PATENT DOCUMENTS

*		DOCUMENT NO.	DATE	COUNTRY	NAME	CLASS	SUB-CLASS
	L						
	M						
	N						
	O						
	P						
	Q						

OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, Etc.)

R	
S	
T	
U	

EXAMINER	DATE	
Firmin Backer	April 9, 2001	Form892ccs2106b

* A copy of this reference is not being furnished with this office action.
(See Manual of Patent Examining Procedure, section 707.05(a).)

2155

CARLTON FIELDS LLP

97 SOUTH SECOND STREET
SUITE 100
SAN JOSE, CALIFORNIA 95113

MAILING ADDRESS:
P.O. BOX 721030, SAN JOSE, CA 95172-1030
TEL (408) 271-2300 FAX (408) 275-9579

#11
4-27-01

OIPE APR 16 2001 PATENT & TRADEMARK OFFICE

Writer's Phone Number: (408) 271-2300

April 11, 2001

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APR 19 2001
Technology Center 2100

Assistant Commissioner for Patents
Washington, DC 20231

Re:	Patent Application Serial No.:	09/524,095
	Inventor:	Christine Halverson, et al.
	Title:	Navigating Network-Based Electronic Information Using Spoken Natural Language Input with Multimodal Error Feedback
	Filed:	March 13, 2000
	Our File No.:	44454/02742/SRI1P037/(US4116-2)

Dear Sir:

Please enter the enclosed Revocation and Power of Attorney into the file of the referenced application.

Very truly yours,

Kevin J. Zilka, Reg. No. 41,429

KJZ:ELm
Enclosure
cc: Edward E. Davis, Asst. Secretary (w/ encl.)

CERTIFICATE OF MAILING

I do hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail, postage prepaid, in an envelope addressed to Assistant Commissioner for Patents, Washington, DC 20231, on the date set forth below.

Erica L. Mann — 4/11/2001
Erica L. Mann — Date

SJC#112.01

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

SRI1P044/44454/02740 (US4015-2)

APPLICATION SERIAL NO.:	09/398,233
INVENTOR:	Douglas E. Appelt, et al.
ASSIGNEE:	SRI International
TITLE:	Information Retrieval by Natural Language Querying
FILING DATE:	September 17, 1999

Attorney Docket No.: SRI1P038/44454/02743 (US4116-4)

APPLICATION SERIAL NO.:	09/524,056
INVENTOR:	Luc Julia et al.
ASSIGNEE:	SRI International
TITLE:	System Method and Article of Manufacture for Navigating Network-Based Electronic Multimedia Content Using Spoken Natural Language Input
FILING DATE:	March 13, 2000

Attorney Docket No.: SRI1P037/44454/02742 (US4116-3)

APPLICATION SERIAL NO.:	09/524,095
INVENTOR:	Christine Halverson
ASSIGNEE:	SRI International
TITLE:	Navigating Network-Based Electronic Information Using Spoken Natural Language Input With Multimodal Error Feedback
FILING DATE:	March 13, 2000

Attorney Docket No.: SRI1P039/44454/02744 (US4116-5)

APPLICATION SERIAL NO.:	09/524,868
INVENTOR:	Luc Julia, et al.
ASSIGNEE:	SRI International
TITLE:	Accessing Network-Based Electronic Information Through Scripted Online Interfaces Using Spoken Natural Language Input
FILING DATE:	March 14, 2000

Attorney Docket No.: SRI1P040/44454/02745 (US4015-3)

APPLICATION SERIAL NO.:	09/613,237
INVENTOR:	James Arnold, et al.
ASSIGNEE:	SRI International
TITLE:	System and Method for Incorporating Concept-Based Retrieval Within Boolean Search Engines
FILING DATE:	July 10, 2000

Attorney Docket No.: SRI1P041/44454/02746 (US4015-4)

APPLICATION SERIAL NO.:	09/613,236
INVENTOR:	James Arnold
ASSIGNEE:	SRI International
TITLE:	System, Method and Article of Manufacture for Interactive Question-Answering and Automated Information Routing
FILING DATE:	July 10, 2000

Attorney Docket No.: SRI1P042/44454/02748 (US4015-5)

APPLICATION SERIAL NO.:	09/613,235
INVENTOR:	James Arnold, et al.
ASSIGNEE:	SRI International
TITLE:	System, Method and Article of Manufacture for Concept Based Information Searching
FILING DATE:	July 10, 2000

Attorney Docket No.: SRI1P043+ (US4148-2P)

APPLICATION SERIAL NO.:	60/228,804
INVENTOR:	Stephen Pullman, et al.
ASSIGNEE:	SRI International
TITLE:	Arbitrary Querying for Information Extraction
FILING DATE:	May 5, 2000

OIPE
APR 1 6 2001
PATENT & TRADEMARK OFFICE

REVOCATION AND POWER OF ATTORNEY

Assistant Commissioner for Patents
Washington, DC 20231

The undersigned assignee of the above-referenced patent applications hereby revokes all prior powers of attorney and appoints as his attorney, with full powers of substitution and revocation, to transact all business in the Patent and Trademark Office connected with these applications and any patents resulting therefrom, the following:

Kevin J. Zilka, Reg. No. 41,429
Dominic M. Kotab, Reg. No. 42,762
C. Douglas McDonald, Reg. No. 26,659
John C. Clark, Reg. No. 43,552

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APR 1 9 2001
Technology Center 2100

Please direct all future communications and telephone calls to:

Kevin J. Zilka
CARLTON FIELDS, P.A.
P.O. Box 721030
San Jose, CA 95172-1030
(408)-271-2300

SRI INTERNATIONAL

Date: 09 April 2001

By: [signature]
Edward E. Davis, Assistant Secretary

#11

UNITED STATES PATENT AND TRADEMARK OFFICE

COMMISSIONER FOR PATENTS
UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. 20231
www.uspto.gov

APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/524,095	03/13/2000	Christine Halverson	SRI1P037

CONFIRMATION NO. 6294

OC000000006017790

I. KEITH STEPHENS
CARLTON, FIELDS, WARD, EMMANUEL, SMITH & CUTLER
P.O. BOX 3239
TAMPA, FL 33601-3239

Date Mailed: 04/27/2001

NOTICE REGARDING POWER OF ATTORNEY

This is in response to the Power of Attorney filed 04/16/2001.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

Lavinia Johnson
Customer Service Center
Initial Patent Examination Division (703) 308-1202

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#12

UNITED STATES PATENT AND TRADEMARK OFFICE

COMMISSIONER FOR PATENTS
UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. 20231
www.uspto.gov

APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/524,095	03/13/2000	Christine Halverson	SRI1P037

CONFIRMATION NO. 6294

OC000000006017814

KEVIN J. ZILKA
CARLTON FIELDS, P.A.
P.O. BOX 721030
SAN JOSE, CA 95172-1030

Date Mailed: 04/27/2001

NOTICE REGARDING POWER OF ATTORNEY

This is in response to the Power of Attorney filed 04/16/2001.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Lavinia Johnson
Customer Service Center
Initial Patent Examination Division (703) 308-1202

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2154

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

OIPE JC
APR 3 0 2001
PATENT & TRADEMARK OFFICE

In re the application of:	
Halverson et al.	Group Art Unit: 2758
Application No. 09/524,095	Atty. Docket No. SRI1P037 44454/02742
Filed: 03/13/2000	
For: NAVIGATING NETWORK-BASED ELECTRONIC INFORMAITON USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK	Date: April 27, 2001

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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, DC 20231 on April 27, 2001.

Signed: Erica L. Mann
Erica L. Mann

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT
UNDER 37 CFR §§ 1.56 AND 1.97(c)

Assistant Commissioner for Patents
Washington, DC 20231

Dear Sir:

The references listed in the attached PTO Form 1449, copies of which are attached, may be material to examination of the above-identified patent application. Applicants submit these references in compliance with their duty of disclosure pursuant to 37 CFR §§ 1.56 and 1.97. The Examiner is requested to make these references of official record in this application.

This Information Disclosure Statement is not to be construed as a representation that a search has been made, that additional information material to the examination of this application does not exist, or that these references indeed constitute prior art.

This Information Disclosure Statement is believed to be filed before the mailing date of a first Office Action on the merits. Accordingly, it is believed that no fees are due in connection with the filing of this Information Disclosure Statement. However, if it is determined that any fees are due, the Commissioner is hereby authorized to charge such fees to Deposit Account 03-0683 (Order No. 44454/02742/SRI1P037).

Respectfully submitted,
CARLTON FIELDS

Dominic M. Kotab
Reg. No. 42,762

P.O. Box 721030
San Jose, CA 95172-1030
Telephone: (408) 271-2300

OIPE JC169 APR 3 0 2001 PATENT & TRADEMARK OFFICE

Form 1449 (Modified) **Information Disclosure Statement By Applicant** (Use Several Sheets if Necessary)	Atty. Docket No. SRI1P037 Applicant: Halverson et al. Filing Date: 03/13/2000	Application No.: 09/524,095 Group Art Unit: 2758

U.S. Patent Documents

Examiner Initial	No.	Patent No.	Date	Patentee	Class	Sub-class	Filing Date
	A						
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Foreign Patent or Published Foreign Patent Application

Examiner Initial	No.	Document No.	Publication Date	Country or Patent Office	Class	Sub-class	Translation Yes	Translation No
	L							
	M							
	N							
	O							
	P							

Other Documents

Examiner Initial	No.	Author, Title, Date, Place (e.g. Journal) of Publication
F.B	R	Stent, Amanda et al., "The CommandTalk Spoken Dialogue System", SRI International
	S	Moore, Robert et al., "CommandTalk: A Spoken-Language Interface for Battlefield Simulations", October 23, 1997, SRI International
FB	T	Dowding, John et al., "Interpreting Language in Context in CommandTalk", February 5, 1999, SRI International

Examiner [signature]	Date Considered 11/21/02

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Form 1449 (Modified) Information Disclosure Statement By Applicant (Use Several Sheets if Necessary)	Atty. Docket No. SRI1P037	Application No.: 09/524,095
	Applicant: Halverson et al.	
	Filing Date: 03/13/2000	Group Art Unit: 2758

OIPE APR 3 0 2001 PATENT & TRADEMARK OFFICE

U.S. Patent Documents

Examiner Initial	No.	Patent No.	Date	Patentee	Class	Sub-class	Filing Date
	A						
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Foreign Patent or Published Foreign Patent Application

Examiner Initial	No.	Document No.	Publication Date	Country or Patent Office	Class	Sub-class	Translation Yes	Translation No
	L							
	M							
	N							
	O							
	P							

Other Documents

Examiner Initial	No.	Author, Title, Date, Place (e.g. Journal) of Publication
F.B	R	http://www.ai.sri.com/~oaa/infowiz.html, "InfoWiz: An Animated Voice Interactive Information System, May 8, 2000
	S	Dowding, John, "Interleaving Syntax and Semantics in an Efficient Bottom-up Parser", SRI International
F.B	T	Moore, Robert et al., "Combining Linguistic and Statistical Knowledge Sources in Natural-Language Processing for ATIS", SRI International
Examiner	[signature]	Date Considered 11/21/02

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Form 1449 (Modified) **Information Disclosure Statement By Applicant** (Use Several Sheets if Necessary)	Atty. Docket No. SRI1P037 Applicant: Halverson et al. Filing Date: 03/13/2000	Application No.: 09/524,095 Group Art Unit: 2758

OIPE JC189 APR 3 0 2001 PATENT & TRADEMARK OFFICE

U.S. Patent Documents

Examiner Initial	No.	Patent No.	Date	Patentee	Class	Sub-class	Filing Date
	A						
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	D						
	E						
	F						
	G						
	H						
	I						
	J						
	K						

RECEIVED MAY 4 - 2001 Technology Center 2100

Foreign Patent or Published Foreign Patent Application

Examiner Initial	No.	Document No.	Publication Date	Country or Patent Office	Class	Sub-class	Translation Yes	Translation No
	L							
	M							
	N							
	O							
	P							

Other Documents

Examiner Initial	No.	Author, Title, Date, Place (e.g. Journal) of Publication
F.B	R	Dowding, John et al., "Gemini: A Natural Language System For Spoken-Language Understanding", SRI International
	S	
	T	

Examiner Frantz B Jacob	Date Considered 1/27/02

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

2155 2100
#14
6-20-01

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.: 09/524,095
INVENTOR: Halversen, Christine
TITLE: NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN INPUT WITH MULTIMODAL ERROR FEEDBACK

FILING DATE: 3/13/00
ATTORNEY DOCKET NO. SRI1P037

NOTICE OF CHANGE OF CORRESPONDENCE ADDRESS

Assistant Commissioner for Patents
Washington, DC 20231

Sir:

Please change the correspondence address relating to the above-identified application as follows:

C. Douglas McDonald , Esq.
Carlton Fields, et al.
P.O. Box 3239
Tampa, FL 33601-3239

Respectfully submitted,

Date: May 10, 2001

C. Douglas McDonald
C. Douglas McDonald
Reg. No. 26,659
CARLTON FIELDS, P.A.
P.O. Box 3239
Tampa, FL 33601-3239
(813) 223-7000
Attorney of Record

TPA#1524975.01

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

#15
LDJ
9-26-01

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)	Docket Number (Optional) SRI 1P037

OIPE
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JC95
PATENT & TRADEMARK OFFICE

In re Application of HALVERSON, et al	
Application Number 09/524,095	Filed March 13, 2000
For Navigating Network-Based Electronic Information Using Spoken Input With Multimodal Error Feedback	
Group Art Unit 2155	Examiner F. Backer

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a response in the above identified application.

The requested extension and appropriate non-small-entity fee are as follows (check time period desired):

- ☐ One month (37 CFR 1.17(a)(1)) $
- ☒ Two months (37 CFR 1.17(a)(2)) $390.00
- ☐ Three months (37 CFR 1.17(a)(3)) $
- ☐ Four months (37 CFR 1.17(a)(4)) $
- ☐ Five months (37 CFR 1.17(a)(5)) $

☒ Applicant claims small entity status. See 37 CFR 1.27. Therefore, the fee amount shown above is reduced by one-half, and the resulting fee is: $ 195.00 .

☒ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Commissioner has already been authorized to charge fees in this application to a Deposit Account.

☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 20-0782 .
I have enclosed a duplicate copy of this sheet.

RECEIVED
SEP 25 2001
Technology Center 2100

I am the ☐ applicant/inventor.

☐ assignee of record of the entire interest. See 37 CFR 3.71
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).

☒ attorney or agent of record.

☐ attorney or agent under 37 CFR 1.34(a).

Registration number if acting under 37 CFR 1.34(a). ______ .

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

September 19, 2001
Date

Signature

KIN-WAH TONG, Reg. No. 39,400
Typed or printed name

09/25/2001 MWOLDER1 00000026 09524095

01 FC:216 195.00 OP

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of _____ forms are submitted.

U.S. Patent and Trademark Office: DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1 ...o persons are required to respond to a collection of information unle... ...splays a valid OMB control number.

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)

Docket Number (Optional)
SRI 1P037

OIPE
SEP 2 1 2001
JC85
PATENT & TRADEMARK OFFICE

In re Application of HALVERSON, et al	
Application Number 09/524,095	Filed March 13, 2000
For Navigating Network-Based Electronic Information Using Spoken Input With Multimodal Error Feedback	
Group Art Unit 2155	Examiner F. Backer

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a response in the above identified application.

The requested extension and appropriate non-small-entity fee are as follows (check time period desired):

- ☐ One month (37 CFR 1.17(a)(1)) $
- ☒ Two months (37 CFR 1.17(a)(2)) $390.00
- ☐ Three months (37 CFR 1.17(a)(3)) $
- ☐ Four months (37 CFR 1.17(a)(4)) $
- ☐ Five months (37 CFR 1.17(a)(5)) $

☒ Applicant claims small entity status. See 37 CFR 1.27. Therefore, the fee amount shown above is reduced by one-half, and the resulting fee is: $ 195.00 .

☒ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Commissioner has already been authorized to charge fees in this application to a Deposit Account.

☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 20-0782 .
I have enclosed a duplicate copy of this sheet.

I am the ☐ applicant/inventor.

☐ assignee of record of the entire interest. See 37 CFR 3.71
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).

☒ attorney or agent of record.

☐ attorney or agent under 37 CFR 1.34(a).

Registration number if acting under 37 CFR 1.34(a). ______ .

RECEIVED
SEP 25 2001
Technology Center 2100

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

September 19, 2001
Date

Signature

KIN-WAH TONG, Reg. No. 39,400
Typed or printed name

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of _____ forms are submitted.

SRI/4116-3

#16
LDS
9-26-01

IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE

PATENT APPLICATION

Applicant(s):	**HALVERSON, et al**	Atty. Docket No. **SRI 1P037**	
Serial No.:	**09/524,095**	Group Art Unit: **2155**	
Filed:	**March 13, 2000**	Examiner:	**F. BACKER**
Title:	**NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN INPUT WITH MULTIMODAL ERROR FEEDBACK**		

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

REVOCATION OF PREVIOUS POWER OF ATTORNEY AND NEW APPOINTMENT

The undersigned assignee of the above-identified application hereby revokes all previous Powers of Attorney and appoints the following attorneys with full power to prosecute the application, to make alterations and amendments therein, and to transact all business in the United States Patent and Trademark Office connected therewith and with full power of substitution and revocation:

Raymond R. Moser, Jr.; Reg. No. 34,682; Kin-Wah Tong, Reg. No. 39,400; Robert Brush, Reg. No. 45,710; Steven Weiner, Reg. No. 38,360; and Edward E. Davis, Reg. No. 35,112.

CHANGE OF CORRESPONDENCE ADDRESS

Please change the correspondence address for the above-identified application to:

Thomason, Moser & Patterson, LLP
595 Shrewsbury Avenue – Suite 100
Shrewsbury, New Jersey 07702

Please direct all telephone calls to: Kin-Wah Tong, telephone # (732) 530-9404

OIPE JC95
SEP 2 1 2001
PATENT & TRADEMARK OFFICE

SRI/4116-3

RECEIVED
SEP 2 5 2001
Technology Center 2100

CERTIFICATE UNDER 37 C.F.R. § 3.73(B)

SRI International, a corporation of the State of California, certifies that it is the assignee of the entire right, title and interest in the patent application identified above by virtue of:

An Assignment from the inventor(s) of the patent application identified above. The Assignment was recorded in the United States Patent and Trademark Office, for which a copy thereof is attached.

The undersigned (whose title is supplied below) is empowered to act on behalf of the assignee.

Respectfully submitted,

Date: 9/11/01

~~EDWARD E. DAVIS, Assistant Secretary~~
STEVEN LOEINIER, VICE-PRESIDENT

SRI International
333 Ravenswood Avenue
Menlo Park, CA 94025
Telephone No.: 650-859-3115

ASSIGNMENT OF PATENT APPLICATION
(Not Accompanying Application)

Whereas I/we the undersigned inventor(s) have invented certain new and useful improvements as set forth in the patent application entitled:

NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK

for which I/we have executed an application for a United States Letters Patent which was filed in the U.S. Patent and Trademark Office on March 13, 2000, and which bears the Application No. 09/524,095.

For good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, I/we the undersigned inventor(s) hereby:

1) Sell(s), assign(s) and transfer(s) to **SRI International**, a California non-profit corporation having a place of business at 333 Ravenswood Avenue, Menlo Park, California 94025, (hereinafter referred to as "ASSIGNEE"), the entire right title and interest in any and all improvements and inventions disclosed in, application(s) based upon, and Patent(s) (including foreign patents) granted upon the information which is disclosed in the above referenced application.

2) Authorize and request the Commissioner of Patents to issue any and all Letters Patents resulting from said application or any division(s), continuation(s), substitutes(s) or reissue(s) thereof to the ASSIGNEE.

3) Agree to execute all papers and documents and, entirely at the ASSIGNEE's expense, perform any acts which are reasonably necessary in connection with the prosecution of said application, as well as any derivative and applications thereof, foreign applications based thereon, and/or the enforcement of patents resulting from such applications.

4) Agree that the terms, covenants and conditions of this assignment shall inure to the benefit of the Assignee, its successors, assigns and other legal representative, and shall be binding upon the inventor(s), as well as the inventor's heirs, legal representatives and assigns.

5) Warrant and represent that I/we have not entered, and will not enter into any assignment, contract, or understanding that conflicts with this assignment.

Signed on the date(s) indicated beside my (our) signature(s).

1) Signature: Christine Halverson Date: 6-16-00.
Typed Name: Christine Halverson

2) Signature: ________ Date: ________
Typed Name: Luc Julia

3) Signature: Dimitris Voutsas Date: 6/16/00
Typed Name: Dimitris Voutsas

4) Signature: Adam J. Cheyer Date: 6/22/00
Typed Name: Adam Cheyer

Attny Docket No. SRI1P037

ASSIGI IENT OF PATENT APPLICA .ON

(Not Accompanying Application)

Whereas I/we the undersigned inventor(s) have invented certain new and useful improvements as set forth in the patent application entitled:

NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK

for which I/we have executed an application for a United States Letters Patent which was filed in the U.S. Patent and Trademark Office on March 13, 2000, and which bears the Application No. 09/524,095.

For good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, I/we the undersigned inventor(s) hereby:

1) Sell(s), assign(s) and transfer(s) to **SRI International**, a California non-profit corporation having a place of business at 333 Ravenswood Avenue, Menlo Park, California 94025, (hereinafter referred to as "ASSIGNEE"), the entire right title and interest in any and all improvements and inventions disclosed in, application(s) based upon, and Patent(s) (including foreign patents) granted upon the information which is disclosed in the above referenced application.

2) Authorize and request the Commissioner of Patents to issue any and all Letters Patents resulting from said application or any division(s), continuation(s), substitutes(s) or reissue(s) thereof to the ASSIGNEE.

3) Agree to execute all papers and documents and, entirely at the ASSIGNEE's expense, perform any acts which are reasonably necessary in connection with the prosecution of said application, as well as any derivative and applications thereof, foreign applications based thereon, and/or the enforcement of patents resulting from such applications.

4) Agree that the terms, covenants and conditions of this assignment shall inure to the benefit of the Assignee, its successors, assigns and other legal representative, and shall be binding upon the inventor(s), as well as the inventor's heirs, legal representatives and assigns.

5) Warrant and represent that I/we have not entered, and will not enter into any assignment, contract, or understanding that conflicts with this assignment.

Signed on the date(s) indicated beside my (our) signature(s).

1) Signature: Christine Halverson Date: 6-16-00.
Typed Name: Christine Halverson

2) Signature: ________ Date: 6·20.00
Typed Name: Luc Julia

3) Signature: ________ Date: 6/16/00
Typed Name: Dimitris Voutsas

4) Signature: ________ Date: ________
Typed Name: Adam Cheyer

Attny Docket No. SRI1P037

ASSIGNMENT OF PATENT APPLICATION
(Not Accompanying Application)

Whereas I/we the undersigned inventor(s) have invented certain new and useful improvements as set forth in the patent application entitled:

NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK

for which I/we have executed an application for a United States Letters Patent which was filed in the U.S. Patent and Trademark Office on March 13, 2000, and which bears the Application No. 09/524,095.

For good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, I/we the undersigned inventor(s) hereby:

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Signed on the date(s) indicated beside my (our) signature(s).

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Typed Name: Christine Halverson

2) Signature: ____________ Date: ________
Typed Name: Luc Julia

3) Signature: [signature] Date: 6/16/00
Typed Name: Dimitris Voutsas

4) Signature: ____________ Date: ________
Typed Name: Adam Cheyer

Attorney Docket No. SRI1P037

Please type a plus sign (+) inside this box → [+]

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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	09/524,095
Filing Date	March 13, 2000
First Named Inventor	HALVERSON
Group Art Unit	2155
Examiner Name	F. BACKER
Attorney Docket Number	SRI 1 P 037
Total Number of Pages in This Submission	

ENCLOSURES *(check all that apply)*

- [x] Fee Transmittal Form
  - [x] Fee Attached
- [x] Amendment / Response
  - [ ] After Final
  - [ ] Affidavits/declaration(s)
- [x] Extension of Time Request
- [ ] Express Abandonment Request
- [ ] Information Disclosure Statement
- [ ] Certified Copy of Priority Document(s)
- [ ] Response to Missing Parts/ Incomplete Application
  - [ ] Response to Missing Parts under 37 CFR 1.52 or 1.53
- [ ] Assignment Papers *(for an Application)*
- [ ] Drawing(s)
- [ ] Licensing-related Papers
- [ ] Petition
- [ ] Petition to Convert to a Provisional Application
- [x] Power of Attorney, Revocation Change of Correspondence Address
- [ ] Terminal Disclaimer
- [ ] Request for Refund
- [ ] CD, Number of CD(s)
- [ ] After Allowance Communication to Group
- [ ] Appeal Communication to Board of Appeals and Interferences
- [ ] Appeal Communication to Group *(Appeal Notice, Brief, Reply Brief)*
- [ ] Proprietary Information
- [ ] Status Letter
- [ ] Other Enclosure(s) *(please identify below)*:

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	KIN-WAH TONG
Signature	K-W Tong
Date	September 19, 2001

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on this date: September 19, 2001

Typed or printed name	Linda DeNardi		
Signature	Linda DeNardi	Date	September 19, 2001

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FEE TRANSMITTAL for FY 2001

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TOTAL AMOUNT OF PAYMENT ($) 195.00

Complete if Known	
Application Number	09/524,095
Filing Date	March 13, 2000
First Named Inventor	HALVERSON
Examiner Name	F. BACKER
Group / Art Unit	2155
Attorney Docket No.	SRI 1P037

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METHOD OF PAYMENT (check one)

1. ☒ The Commissioner is hereby authorized to charge indicated fees and credit any over payments to:

Deposit Account Number: 20-0782

Deposit Account Name:

☒ Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17

☒ Applicant claims small entity status. See 37 CFR 1.27

2. ☒ Payment Enclosed:

☒ Check ☐ Credit card ☐ Money Order ☐ Other

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
101	710	201	355	Utility filing fee	
106	320	206	160	Design filing fee	
107	490	207	245	Plant filing fee	
108	710	208	355	Reissue filing fee	
114	150	214	75	Provisional filling fee	

SUBTOTAL (1) ($) 0

2. EXTRA CLAIM FEES

			Extra Claims		Fee from below		Fee Paid
Total Claims		-20** =	0	X		=	0
Independent Claims		-3** =	0	X		=	0
Multiple Dependent				X		=	0

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description
103	18	203	9	Claims in excess of 20
102	80	202	40	Independent claims in excess of 3
104	270	204	135	Multiple dependent claim, if not paid
109	80	209	40	** Reissue independent claims over original patent
110	18	210	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) ($) 0

**or number previously paid, if greater; For Reissues, see above

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
105	130	205	65	Surcharge - late filing fee or oath	
127	50	227	25	Surcharge - late provisional filing fee or cover sheet.	
139	130	139	130	Non-English specification	
147	2,520	147	2,520	For filing a request for reexamination	
112	920*	112	920*	Requesting publication of SIR prior to Examiner action	
113	1,840*	113	1,840*	Requesting publication of SIR after Examiner action	
115	110	215	55	Extension for reply within first month	
116	390	216	195	Extension for reply within second month	195.00
117	890	217	445	Extension for reply within third month	
118	1,390	218	695	Extension for reply within fourth month	
128	1,890	228	945	Extension for reply within fifth month	
119	310	219	155	Notice of Appeal	
120	310	220	155	Filing a brief in support of an appeal	
121	270	221	135	Request for oral hearing	
138	1,510	138	1,510	Petition to institute a public use proceeding	
140	110	240	55	Petition to revive – unavoidable	
141	1,240	241	620	Petition to revive – unintentional	
142	1,240	242	620	Utility issue fee (or reissue)	
143	440	243	220	Design issue fee	
144	600	244	300	Plant issue fee	
122	130	122	130	Petitions to the Commissioner	
123	130	123	130	Petitions related to provisional applications	
126	180	126	180	Submission of Information Disclosure Stmt	
581	40	581	40	Recording each patent assignment per property (times number of properties)	
146	710	246	355	Filing a submission after final rejection (37 CFR § 1.129(a))	
149	710	249	355	For each additional invention to be examined (37 CFR § 1.129(b))	
179	710	279	355	Request for Continued Examination (RCE)	
169	900	169	900	Request for expedited examination of a design application	

Other fee (specify)

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) ($) 195.00

SUBMITTED BY				Complete *(if applicable)*	
Name (Print/Type)	KIN-WAH TONG	*Registration No. Attorney/Agent)*	39,400	*Telephone*	(732) 530-9404
Signature	K. W. Tong			*Date*	SEPTEMBER 19, 2001

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#16

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APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/524,095	03/13/2000	Christine Halverson	SRI1P037

CONFIRMATION NO. 6294

OC000000006797094

C. Douglas McDonald, ESQ.
CARLTON FIELDS, et al.
P.O. Box 3239
Tampa, FL 33601-3239

Date Mailed: 09/26/2001

NOTICE REGARDING POWER OF ATTORNEY

This is in response to the Power of Attorney filed 09/21/2001.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

Lavinia Johnson
LAVINIA D JOHNSON
2100 7033085229

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#17

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UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. 20231
www.uspto.gov

APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/524,095	03/13/2000	Christine Halverson	SRI1P037

CONFIRMATION NO. 6294

OC000000006797149

OC000000006797149

THOMASON, MOSER & PATTERSON, LLP
595 SHREWSBURY AVENUE
SUITE 100
SHREWSBURY, NJ 07702

Date Mailed: 09/26/2001

NOTICE REGARDING POWER OF ATTORNEY

This is in response to the Power of Attorney filed 09/21/2001.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Lavinia Johnson

LAVINIA D JOHNSON
2100 7033085229

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09/524,095

#18
LDT
9-26-01

IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE

PATENT APPLICATION

Applicant: **Halverson et al.**

Case: **SRI1P037**

Serial No.: **09/524,095** Filed: **March 13, 2000**

Group Art Unit: **2155**

Examiner: **Firmin Backer**

Title: **NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK**

ASSISTANT COMMISSIONER FOR PATENTS
Box Non-Fee Amendment
Washington, D. C. 20231

S I R:

RESPONSE UNDER 37 C.F.R. § 1.111

This response addresses the Office Action dated April 24, 2001 (Paper No. 10).

REMARKS

In view of the following discussion, the Applicants submit that none of the claims now pending in the application are anticipated under the provisions of 35 U.S.C. § 102. Thus, the Applicants believe that all of these claims are now in allowable form.

I. REJECTION OF CLAIMS 56-126 UNDER 35 U.S.C. § 102

The Examiner has rejected claims 56-126 in Paragraphs 2-33 of the Office Action as being anticipated by the Levin et al. patent (US Patent 6,173,279 issued January 9, 2001, hereinafter referred to as Levin). The rejection is respectfully traversed.

Levin teaches "a method of using at least one natural language query to retrieve information from one or more data resources and further performing a requested action using the retrieved information is disclosed". (See Levin, Column 2, lines 15-18) Namely, Levin teaches a method for using natural language query to obtain information, where upon receipt of the requested information, a desired action is executed based upon the requested information. To illustrate, Levin provides the example, where a user employs natural language to request the telephone number of a restaurant. Upon receipt of the telephone number, the telephone number is actually dialed for the user. (See Levin, Column 3 line 62 to Column 4, line 1)

In contrast, Levin fails to teach or suggest the novel concept of speech-based navigation where the method solicits additional input from the user, including user interaction in a modality different than the original request. Specifically, Applicants' independent claims 56, 82 and 101 positively recite:

56. A method for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising the steps of:

(a) receiving a spoken request for desired information from the user;
(b) rendering an interpretation of the spoken request;
(c) constructing at least part of a navigation query based upon the interpretation;
(d) soliciting additional input from the user, including user interaction in a modality different than the original request;
(e) refining the navigation query, based upon the additional input;
(f) using the refined navigation query to select a portion of the electronic data source; and
(g) transmitting the selected portion of the electronic data source from the network server to a client device of the user. (emphasis added)

82. A system for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, the system comprising:

(a) a portable microphone operable to receive a spoken request for desired information from the user;

(b) language processing logic, operable to render an interpretation of the spoken request;

(c) query construction logic, operable to construct a navigation query

in response to the interpretation of the spoken request;
(d) user interaction logic, operable to solicit additional input from the user, including user interaction in a modality different than the original request;
(e) query refining logic, operable to refine the navigation query, based upon the additional input;
(f) navigation logic, operable to select a portion of the electronic data source using the navigation query; and
(g) electronic communications infrastructure for transmitting the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user. (emphasis added)

101. A computer program embodied on a computer readable medium for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising:
(a) a code segment that receives a spoken request for desired information from the user;
(b) a code segment that renders an interpretation of the spoken request;
(c) a code segment that constructs at least part of a navigation query based upon the interpretation;
(d)a code segment that solicits additional input from the user, including user interaction in a modality different than the original request;
(e) a code segment that refines the navigation query, based upon the additional input;
(f) a code segment that uses the refined navigation query to select a portion of the electronic data source; and
(g) a code segment that transmits the selected portions of the electronic data source from the network server to a primarily stationary, display device located locally with the user. (emphasis added)

Applicants' invention teaches a novel method and apparatus for speech-based navigation where the method solicits additional input from the user, including user interaction **in a modality different than the original request**. Specifically, Applicants address the criticality of errors and deficiencies via user interface modalities in addition to spoken natural language. It has been observed that users are often frustrated by ineffective or non optimal speech-based navigation that simply engages the user repeatedly in a long series of questions and answers, i.e., "single modal interaction", to perfect the navigation query. This single modal approach is often tedious and uninspiring for a user who must refine the navigation query repeatedly to achieve the desired result, thereby increasing the time the user must interact with a system. In fact, one goal of the speech-based navigation is to relieve this very tedium where the user must engage a system repeatedly, e.g., via a long sequence of menus to achieve the desired result.

To address this criticality, Applicants' navigation query can be refined via input from the user, where the user interaction is in a modality different than the original request. To illustrate, if a portion of the navigation query can be achieved, then the result can be presented to the user in a way that the user can provide additional input via interaction that is in a modality that is different than the original request. For example, if the "partial" navigation query produces three possible results, then the results can be presented to the user via a menu with the most likely result being highlighted. The user can then press a button on a remote unit to accept the highlighted result or simply scroll to one of the other three choices. Thus, the pressing of the button by the user is a user interaction that is in a different modality than the original request, e.g., a natural language request that originally started the navigation request. This is an important aspect of the invention because of the psychological and real effect where the user perceives that the navigation query is actually progressing closer to the achieved result.

In contrast, Levin teaches that "the service host 112 determines if there are any ambiguities with respect to the response (step 222) and, if so, forwards **additional queries** to the user to help to resolve the ambiguities (step 224)". (emphasis added) (See Levin, Column 6, lines 40-43). Additionally, Levin states that "[t]he service host 112 includes a dialog control program that manages interactions with users **over several turns (e.g., it decides when to ask a question, when to give an answer**, provides means for clarifying ambiguities, and provides error control and recovery during an interaction)". (emphasis added) (See Levin, Column 5, lines 15-20). Levin's single modal approach is contrary to Applicants' invention and is one of the criticalities that Applicants' invention is designed to address. To further support Applicants' position, Levin states that "[t]he invention is independent of the actual modality of call placement". (See Levin, Column 4, lines 29-31) This statement is another clear indication that Levin is totally unconcerned with the modality of the user interaction and is simply teaching a single modal approach via queries and answers.

Therefore, the Applicants respectfully submit that independent claims 56, 82 and 101 are not anticipated by the Levin reference. As such, claims 56, 82 and 101 fully satisfy the requirements of 35 U.S.C. §102 and are patentable thereunder.

Claims 57-81, 83-100 and 102-126 depend, either directly or indirectly, from claims 56, 82 and 101 and recite additional features therefor. Since Levin fails to anticipate Applicants' invention as recited in Applicants' independent claims 56, 82 and 101, dependent claims 57-81, 83-100 and 102-126 are also not anticipated under 35 U.S.C. § 102 and are allowable for the same reason noted above.

Conclusion

Thus, the Applicants submit that all of these claims now fully satisfy the requirements of 35 U.S.C. §102. Consequently, the Applicants believe that all these claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues requiring the issuance of a final action in any of the claims now pending in the application, it is requested that the Examiner telephone Mr. Kin-Wah Tong, Esq. at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

9/19/01

K. W. Tong

Kin-Wah Tong, Attorney
Reg. No. 39,400
(732) 530-9404

Moser, Patterson & Sheridan, LLP
595 Shrewsbury Avenue
First Floor,
Shrewsbury, New Jersey 07702

GAU 2155

PTO/SB/21 (08-00)

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First Named Inventor	HALVERSON
Group Art Unit	2155
Examiner Name	F. BACKER
Attorney Docket Number	SRI 1 P 037
Total Number of Pages in This Submission	

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- [x] Fee Transmittal Form
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- [ ] Other Enclosure(s) *(please identify below)*:

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm *or* Individual name	KIN-WAH TONG
Signature	K-W Tong
Date	September 19, 2001

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Deposit Account Name	

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☒ Applicant claims small entity status. See 37 CFR 1.27

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☒ Check ☐ Credit card ☐ Money Order ☐ Other

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				SUBTOTAL (1)	($) 0

2. EXTRA CLAIM FEES

			Extra Claims		Fee from below		Fee Paid
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Independent Claims		-3** =	0	X		=	0
Multiple Dependent				X		=	0

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**or number previously paid, if greater; For Reissues, see above

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117	890	217	445	Extension for reply within third month	
118	1,390	218	695	Extension for reply within fourth month	
128	1,890	228	945	Extension for reply within fifth month	
119	310	219	155	Notice of Appeal	
120	310	220	155	Filing a brief in support of an appeal	
121	270	221	135	Request for oral hearing	
138	1,510	138	1,510	Petition to institute a public use proceeding	
140	110	240	55	Petition to revive – unavoidable	
141	1,240	241	620	Petition to revive – unintentional	
142	1,240	242	620	Utility issue fee (or reissue)	
143	440	243	220	Design issue fee	
144	600	244	300	Plant issue fee	
122	130	122	130	Petitions to the Commissioner	
123	130	123	130	Petitions related to provisional applications	
126	180	126	180	Submission of Information Disclosure Stmt	
581	40	581	40	Recording each patent assignment per property (times number of properties)	
146	710	246	355	Filing a submission after final rejection (37 CFR § 1.129(a))	
149	710	249	355	For each additional invention to be examined (37 CFR § 1.129(b))	
179	710	279	355	Request for Continued Examination (RCE)	
169	900	169	900	Request for expedited examination of a design application	

Other fee (specify)

*Reduced by Basic Filing Fee Paid SUBTOTAL (3) ($) 195.00

RECEIVED SEP 25 2001 Technology Center 2100

SUBMITTED BY				Complete *(if applicable)*	
Name (Print/Type)	KIN-WAH TONG	*Registration No. Attorney/Agent)*	39,400	*Telephone*	(732) 530-9404
Signature	K. W. Tong			*Date*	SEPTEMBER 19, 2001

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

SRJ/4116-3

#19
LDJ
10-9-01

IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE

PATENT APPLICATION

Applicant(s):	**HALVERSON, et al**	Atty. Docket No.	**SRI 1P037**
Serial No.:	**09/524,095**	Group Art Unit:	**2155**
Filed:	**March 13, 2000**	Examiner:	**F. BACKER**
Title:	**NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN INPUT WITH MULTIMODAL ERROR FEEDBACK**		

REQUEST FOR CORRECTED FILING RECEIPT

RECEIVED
OCT 0 5 2001
Technology Center 2100

Assistant Commissioner for Patents
Office of Initial Patent Examination
Customer Service Center
Washington, D. C. 20231

SIR:

Please issue a corrected filing receipt reflecting the correct spelling of the first name of the fourth inventor as follows:

Adam J. Cheyer

Respectfully submitted

Date 9/28/01

KIN-WAH TONG, Attorney
Reg. No. 39,400

Moser, Patterson & Sheridan, LLP
595 Shrewsbury Avenue – Suite 100
Shrewsbury, New Jersey 07702
(732)530-9404

UNITED STATES PATENT AND TRADEMARK OFFICE

COMMISSIONER FOR PATENTS
UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. 20231
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APPLICATION NUMBER	FILING DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	DRAWINGS	TOT CLAIMS	IND CLAIMS
09/524,095	03/13/2000	2758	1529	SRI1P037	7	55	3

Hickman Stephens Coleman & Hughes LLP
PO Box 52037
Palo Alto, CA 94303-0746

FILING RECEIPT

OC000000005388294

Date Mailed: 09/11/2000

Receipt is acknowledged of this nonprovisional Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please write to the Office of Initial Patent Examination's Customer Service Center. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the PTO processes the reply to the Notice, the PTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).**

Applicant(s)

Christine Halverson, San Jose, CA ;
Luc Julia, Menlo Park, CA ;
Dimitris Voutsas, Thessaloniki, GREECE;
Aden J. Cheyer, Palo Alto, CA ;
ADAM

Continuing Data as Claimed by Applicant

THIS APPLICATION IS A CIP OF 09/225,198 01/05/1999
WHICH CLAIMS BENEFIT OF 60/124,718 03/17/1999
WHICH CLAIMS BENEFIT OF 60/124,719 03/17/1999
WHICH CLAIMS BENEFIT OF 60/124,720 03/17/1999

Foreign Applications

If Required, Foreign Filing License Granted 05/12/2000

**** SMALL ENTITY ****

RECD SEP 18 2000

Title

Navigating network-based electronic information using spoken natural language input with multimodal error feedback

Preliminary Class

709

SRJ/4116-3

CERTIFICATE OF FACSIMILE TRANSMISSION

Under 37 C.F.R.§ 1.8(a)

I certify that this correspondence is being transmitted by facsimile (703-308-7751) under 37 C.F.R. 1.8(a) on September 28, 2001 and is addressed to the Assistant Commissioner for Patents, Office of Initial Patent Examination, Customer Service Center, Washington, D.C. 20231.

Linda DeNardi
Type or print name of person signing certification

Linda DeNardi
Signature

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/524,095	03/13/00	HALVERSON C	SRI1P037

TM02/1010
THOMASON, MOSER & PATTERSON, LLP
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SUITE 100
SHREWSBURY NJ 07702

EXAMINER	
BACKER, F	
ART UNIT	PAPER NUMBER
2155	# 20

DATE MAILED: 10/10/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

PTO-90C (Rev. 2/95)
*U.S. GPO: 2000-473-000/44602

1- File Copy

Office Action Summary	**Application No.**	**Applicant(s)**	
	09/524,095	HALVERSON ET AL.	
	Examiner	**Art Unit**	
	Firmin Backer	2155	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). *In no event, however, may a reply be timely filed* after SIX (6) MONTHS from the mailing date of this communication.
- *If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.*
- *If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.*
- *Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).*
- Any reply received by the Office later than three months after the mailing date of this communication, *even if timely filed, may reduce any* earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 September 2001* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *56-126* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *56-126* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) ☐ Notice of References Cited (PTO-892)
16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
18) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
19) ☐ Notice of Informal Patent Application (PTO-152)
20) ☐ Other: .

Response to Request for Reconsideration

This is in response to a request for reconsideration file on September 26th, 2001. Claims 56-126 are being reconsidered in this action.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claims 56-126 are rejected under 35 U.S.C. 102(e) as being anticipated by Levin et al. (U.S. Patent No. 6,173,279).

3. As per claim 56, Levin et al teach a method for speech-based navigation (information server, 110) of an electronic data source located at one or more network servers located remotely from a user, (see abstract, fig 1, column 3 lines 5-35), comprising receiving a spoken request (*receive a natural language query*) for desired information from the user (user); rendering an interpretation (*creating a semantic representation*) of the spoken request, constructing a navigation (*generating search)* query based upon the interpretation; soliciting additional input from the user (*one or more questions are generated...*), including user interaction in a modality different that the original request and, refining the navigation query, based upon the additional input (see column 6 lines 20-59), using the navigation query to select a portion of the electronic

data source; and transmitting the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user. (see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22)

4. As per claim 57, Levin et al teach a method of rendering the interpretation includes deriving linguistic information by using a speech recognition and a linguistic parser (see abstract, fig 1, column 3 lines 37-5 lines 40).

5. As per claim 58-62, Levin et al teach a method of constructing a navigation query in the form of a database query on a computing device located on a network including extracting an input template for an online scripted interface to the data source to be used for the construction of the navigation query and dynamically scraping the online scripted interface (see abstract, fig. 1-3, column 3 line 36-9 line 5)

6. As per claim 63-68, Levin et al teach a method of soliciting additional input is performed in response deficiency including unresolved word encountered after the first navigation of the data source, required element of the navigational query, data recorded within the data source, failure to identify data record responsive to navigational query (see column 6 lines 20-59).

7. As per claim 69, Levin et al teach a method wherein the additional input is solicited upon receiving a user-input statement...(see column 6 lines 20-59).

8. As per claim 70-73, Levin et al teach a method of soliciting additional input from the user, including presenting: a menu, a textual or an audible request, a list of portions of data source (see abstract, fig. 1-3, column 3 line 36-9 line 5).

9. As per claim 74-75, Levin et al teach a method wherein additional input received from the user is speech based, of no spoken input source (see abstract, fig. 1-3, column 3 line 36-9 line 5).

10. As per claim 76, Levin et al teach a method wherein steps (d)-(e) are repeated until the navigational query if deemed adequate source (see abstract, fig. 1-3, column 3 line 36-9 line 5).

11. As per claim 77, 78, Levin et al teach a method wherein the input modality includes selecting (by speaking) from a displayed option menu (see abstract, fig. 1-3, column 3 line 36-9 line 5).

12. As per claim 79, Levin et al teach a method performed with respect to a plurality of user and corresponding client devices (see abstract, fig. 1-3, column 3 line 36-9 line 5).

13. As per claim 80-81, Levin et al teach a method of selecting data source from plurality of electronic data source storing multimedia content including audio and video content (see abstract, fig. 1-3, column 3 line 36-9 line 5)

14. As per claim 82, Levin et al teach a system for speech-based navigation (*information server, 110*) of an electronic data source located at one or more network servers located remotely from a user, (see abstract, fig 1, column 3 lines 5-35), comprising a portable microphone (*microphone, 105*) receiving a spoken request (*receive a natural language query*) for desired information from the user (user) a language processing logic (*natural language server, 114*) rendering an interpretation (*creating a semantic representation*) of the spoken request, (see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22) a query construction logic (*service host, 112*) constructing a navigation (*generating search)* query based upon the interpretation; a query interaction logic (*service host, 112)* soliciting additional input from the user (*one or more questions are generated...*), including user interaction in a modality different that the original request and, (see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22), a query refining logic (*service host, 112)* refining the navigation query, based upon the additional input (see column 6 lines 20-59), a navigation logic (*service host, 112)* using the navigation query to select a portion of the electronic data source; electronic infrastructure (*network, 108*) transmitting the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user. (see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22).

15. As per claim 83, Levin et al teach a system of rendering the interpretation includes deriving linguistic information by using a speech recognition and a linguistic parser (see abstract, fig 1, column 3 lines 37-5 lines 40).

16. As per claim 84-86, Levin et al teach a system of constructing a navigation query in the form of a database query on a computing device located on a network including extracting an input template for an online scripted interface to the data source to be used for the construction of the navigation query and dynamically scraping the online scripted interface (see abstract, fig. 1-3, column 3 line 36-9 line 5).

17. As per claim 87, 88, 100, Levin et al teach a system wherein at least a portion of the language processing if hosted on a computing device coupled with a microphone located locally with a user and a network computing device located remotely and data in a two-way communication infrastructure (coaxial, DSL, satellite, wireless/cellular, fiber-optic) (see abstract, fig. 1-3, column 3 line 36-9 line 5).

18. As per claim 89-94, Levin et al teach a system of soliciting additional input is performed in response deficiency including unresolved word encountered after the first navigation of the data source, required element of the navigational query, data recorded within the data source, failure to identify data record responsive to navigational query (see column 6 lines 20-59).

19. As per claim 95, 96, Levin et al teach a system wherein the input modality includes selecting (by speaking) from a displayed option menu (see abstract, fig. 1-3, column 3 line 36-9 line 5).

20. As per claim 97-98, Levin et al teach a system of selecting data source from plurality of electronic data source storing multimedia content including audio and video content (see abstract, fig. 1-3, column 3 line 36-9 line 5).

21. As per claim 99, Levin et al teach a system wherein the display device receives data from the electronic device on the network via a communication box (see abstract, fig. 1-3, column 3 line 36-9 line 5).

22. As per claim 101, Levin et al teach a computer program for speech-based navigation (information server, 110) of an electronic data source located at one or more network servers located remotely from a user, (see abstract, fig 1, column 3 lines 5-35), comprising code segment receiving a spoken request (*receive a natural language query*) for desired information from the user (user); code segment rendering an interpretation (*creating a semantic representation*) of the spoken request, code segment constructing a navigation (*generating search)* query based upon the interpretation; soliciting additional input from the user (*one or more questions are generated...*), including user interaction in a modality different that the original request and, code segment refining the navigation query, based upon the additional input (see column 6 lines 20-59), code segment using the navigation query to select a portion of the electronic data source; and code segment transmitting the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user (see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22).

23. As per claim 102, Levin et al teach a code segment deriving linguistic information by using a speech recognition and a linguistic parser (see abstract, fig 1, column 3 lines 37-5 lines 40).

24. As per claim 103-105, Levin et al teach a code segment of constructing a navigation query in the form of a database query on a computing device located on a network including extracting an input template for an online scripted interface to the data source to be used for the construction of the navigation query and dynamically scraping the online scripted interface (see abstract, fig. 1-3, column 3 line 36-9 line 5).

25. As per claim 106-107, Levin et al teach a computer program wherein rendering of the interpretation and the construction of the navigation query are performed on a computing device located locally with or remotely from the user (see abstract, fig. 1-3, column 3 line 36-9 line 5).

26. As per claim 108-114, Levin et al teach a code segment that solicits additional input display on option menu is performed by speaking in response deficiency including unresolved word encountered after the first navigation of the data source, required element of the navigational query, data recorded within the data source, failure to identify data record responsive to navigational query (see column 6 lines 20-59).

27. As per claim 115, Levin et al teach a computer program the act of selecting from the display is performed by speaking (see column 6 lines 20-59)

28. As per claim 116, Levin et al teach a code segment of the computer program operate with respect to a plurality of simultaneous user and corresponding client devices (see abstract, fig. 1-3, column 3 line 36-9 line 5).

29. As per claim 117, Levin et al teach a code segment that select data source form a plurality of electronic data source .... content (see abstract, fig. 1-3, column 3 line 36-9 line 5).

30. As per claim 118, Levin et al teach a computer program of selecting data source from plurality of electronic data source storing multimedia content including audio and video content (see abstract, fig. 1-3, column 3 line 36-9 line 5).

31. As per claim 119, Levin et al teach a computer program wherein the additional input is solicited upon receiving a user-input statement...(see column 6 lines 20-59).

32. As per claim 120-123, Levin et al teach a code segment of soliciting additional input from the user, including presenting: a menu, a textual or an audible request, a list of portions of data source (see abstract, fig. 1-3, column 3 line 36-9 line 5).

33. As per claim 124-125, Levin et al teach a computer program wherein additional input received from the user is speech based, of no spoken input source (see abstract, fig. 1-3, column 3 line 36-9 line 5).

34. As per claim 126, Levin et al teach a code segment wherein steps (d)-(e) are repeated until the navigational query if deemed adequate source (see abstract, fig. 1-3, column 3 line 36-9 line 5).

Response to Arguments

Applicant's arguments filed on September 26th, 2001 have been fully considered but they are not persuasive.

Applicant argues that the prior art (Levin et al) fail to teach or suggest an inventive concept wherein “soliciting additional input from the user including user interaction in a modality different than the original request.” Examiner respectfully disagrees with the applicant’s perspective and characterization of Levin’s inventive concept. Levin et al teach a system and method of using natural language to retrieve information. In that particular if the service host 112, based on the rules, decides that there is enough information for performing a database access, the database query is generated. The database query is generally in one of the standard query languages (e.g. SQL). The service host 112 also determines if there are any ambiguities with respect to the response (step 222) and, if so, forwards additional queries to the user to help to resolve the ambiguities (step 224). The service host 112 then sends the responses to the information server 110 (step 226). If there are too many potential answers (for instance if there are two pizza places on Main Street in Westfield), one or more questions to the user are generated in order to disambiguate the query (e.g. Do you mean "Venezia" or "Bella Roma?").

The answers to the additional questions are used to formulate a new logical search query. For this there might be additional rules like: if(Action_Object=Pizza_Restaurant and Too-Many_Answers) then User must provide further clarifying information such as, for example, the name of restaurant OR exact address. If the user does not provide enough information to achieve a single answer, the service host 112 might then list the possibilities and ask the user to chose one of them (*see column 6 lines 28-59*). This is a way to require additional information from the user in order to generate user's request.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Firmin Backer whose telephone number is 703-305-0624. The examiner can normally be reached on Mon-Thu 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sheikh Ayaz can be reached on 703-305-9648. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3718 for regular communications and 703-305-5352 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Firmin Backer
October 2, 2001

AYAZ SHEIKH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/524,095	03/13/2000	Christine Halverson	SRI1P037	6294

25696 7590 01/15/2002

OPPENHEIMER WOLFF & DONNELLY
P. O. BOX 10356
PALO ALTO, CA 94303

EXAMINER
BACKER, FIRMIN

ART UNIT	PAPER NUMBER
2155	21

DATE MAILED: 01/15/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

Interview Summary	Application No. 09/524,095	Applicant(s) HALVERSON ET AL.	
	Examiner Firmin Backer	Art Unit 2155	

All participants (applicant, applicant's representative, PTO personnel):

(1) Firmin Backer (examiner).

(2) Ario Etienne (primary examiner).

(3) Kin-Wah Tong (Attorney).

(4) _____.

Date of Interview: 08 January 2002 .

Type: a)☒ Telephonic b)☐ Video Conference
c)☐ Personal [copy given to: 1)☐ applicant 2)☐ applicant's representative]

Exhibit shown or demonstration conducted: d)☐ Yes e)☐ No.
If Yes, brief description: _____ .

Claim(s) discussed: 56 .

Identification of prior art discussed: 6,173,279 .

Agreement with respect to the claims f)☐ was reached. g)☐ was not reached. h)☐ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: *Applicant argues that the statutory double patenting rejection is improper and should be withdrawn. Applicant argues that the prior art fails to teach all the limitations of the inventive concept especially the concept of transmitting the selected portion of the electronic data source from the network server to a client device of the user* .

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

i)☐ It is not necessary for applicant to provide a separate record of the substance of the interview(if box is checked).

Unless the paragraph above has been checked, THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

Examiner Note: You must sign this form unless it is an Attachment to a signed Office action.

Examiner's signature, if required

22
BT 1/17/02
Not Entered

09/524,095

IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE

PATENT APPLICATION

Applicant: **Halverson et al.**

Case: **SRI1P037**

Serial No.: **09/524,095** Filed: **March 13, 2000**

Group Art Unit: **2155**

Examiner: **Firmin Backer**

Title: **NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK**

ASSISTANT COMMISSIONER FOR PATENTS
Box AF
Washington, D. C. 20231

S I R:

RESPONSE UNDER 37 C.F.R. § 1.116

This response addresses the Final Office Action dated October 10, 2001. The Final Office Action appears to be labeled as Paper No. 20.

REMARKS

Applicants' representative would like to thank Examiner Backer and Primary Examiner Etienne for kindly taking a substantial amount of time on January 8, 2002 to discuss the merits of the subject invention. Applicants' representative is aware of the time constraint that is placed on the Examiners and is appreciative of the Examiners' willingness to devote such large quantity of time to discuss the case on the merit.

In view of the following discussion, the Applicants submit that none of the claims now pending in the application are anticipated under the provisions of 35 U.S.C. § 102. Thus, the Applicants believe that all of these claims are now in allowable form.

09/524,095

I. REJECTION OF CLAIMS 56-126 UNDER 35 U.S.C. § 102

The Examiner has rejected claims 56-126 in Paragraphs 2-34 of the Final Office Action as being anticipated by the Levin et al. patent (US Patent 6,173,279 issued January 9, 2001, hereinafter referred to as Levin). The rejection is respectfully traversed.

Levin teaches "a method of using at least one natural language query to retrieve information from one or more data resources and further performing a requested action using the retrieved information is disclosed". (See Levin, Column 2, lines 15-18) Namely, Levin teaches a method for using natural language query to obtain information, where upon receipt of the requested information, a desired action is executed based upon the requested information. To illustrate, Levin provides the example, where a user employs natural language to request the telephone number of a restaurant. Upon receipt of the telephone number, the telephone number is actually dialed for the user. (See Levin, Column 3 line 62 to Column 4, line 1)

In contrast, Levin fails to teach or suggest the novel concept of speech-based navigation where the method solicits additional input from the user, including user interaction in a modality different than the original request. Specifically, Applicants' independent claims 56, 82 and 101 positively recite:

56. A method for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising the steps of:
(a) receiving a spoken request for desired information from the user;
(b) rendering an interpretation of the spoken request;
(c) constructing at least part of a navigation query based upon the interpretation;
(d) soliciting additional input from the user, including user interaction in a modality different than the original request;
(e) refining the navigation query, based upon the additional input;
(f) using the refined navigation query to select a portion of the electronic data source; and
(g) transmitting the selected portion of the electronic data source from the network server to a client device of the user. (emphasis added)

82. A system for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, the system comprising:

(a) a portable microphone operable to receive a spoken request for desired information from the user;

(b) language processing logic, operable to render an interpretation of the spoken request;

(c) query construction logic, operable to construct a navigation query in response to the interpretation of the spoken request;

(d) <u>user interaction logic, operable to solicit additional input from the user, including user interaction in a modality different than the original request;</u>

(e) query refining logic, operable to refine the navigation query, based upon the additional input;

(f) navigation logic, operable to select a portion of the electronic data source using the navigation query; and

(g) electronic communications infrastructure for transmitting the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user. (emphasis added)

101. A computer program embodied on a computer readable medium for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising:

(a) a code segment that receives a spoken request for desired information from the user;

(b) a code segment that renders an interpretation of the spoken request;

(c) a code segment that constructs at least part of a navigation query based upon the interpretation;

<u>(d)a code segment that solicits additional input from the user, including user interaction in a modality different than the original request;</u>

(e) a code segment that refines the navigation query, based upon the additional input;

(f) a code segment that uses the refined navigation query to select a portion of the electronic data source; and

(g) a code segment that transmits the selected portions of the electronic data source from the network server to a primarily stationary, display device located locally with the user. (emphasis added)

Pursuant to the Examiner Interview, Applicants directed the Examiner's attention to the fact that Applicants' invention teaches a novel method and apparatus for speech-based navigation <u>where the method solicits additional input from the user, including user interaction **in a modality different than the original request**</u>. Specifically, Applicants address the criticality of errors and deficiencies via user interface modalities in addition to spoken natural language. It has been observed that users are often frustrated by ineffective or non optimal speech-based navigation that simply engages the user repeatedly in a long series of questions and answers, i.e., "single modal interaction", to perfect the navigation query. This single modal approach is often tedious and uninspiring for a user who must refine the navigation query repeatedly to achieve the desired result, thereby increasing the time the user must interact with a system. In fact, one goal of the speech-based navigation is to relieve this very tedium where the user must engage a system repeatedly, e.g., via a long sequence of menus to achieve the desired result.

To address this criticality, Applicants' navigation query can be refined via input from the user, where the user interaction is in a modality different than the original request. To illustrate, if a portion of the navigation query can be achieved, then the result can be presented to the user in a way that the user can provide additional input via interaction that is in a modality that is different than the original request. For example, if the "partial" navigation query produces three possible results, then the results can be presented to the user via a menu with the most likely result being highlighted. The user can then press a button on a remote unit to accept the highlighted result or simply scroll to one of the other three choices. Thus, the pressing of the button by the user is a **user interaction that is in a different modality than the original request, e.g., a natural language request that originally started the navigation request**. This is an important aspect of the invention because of the psychological and real effect where the user perceives that the navigation query is actually progressing closer to the achieved result.

In contrast, Levin teaches that "the service host 112 determines if there are any ambiguities with respect to the response (step 222) and, if so, forwards **additional queries** to the user to help to resolve the ambiguities (step 224)". (emphasis added) (See Levin, Column 6, lines 40-43). Additionally, Levin states that "[t]he service host 112 includes a dialog control program that manages interactions with users **over several turns (e.g., it decides when to ask a question, when to give an answer,** provides means for clarifying ambiguities, and provides error control and recovery

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during an interaction)". (emphasis added) (See Levin, Column 5, lines 15-20). Levin's single modal approach is contrary to Applicants' invention and is one of the criticalities that Applicants' invention is designed to address. To further support Applicants' position, Levin states that "[t]he invention is independent of the actual modality of call placement". (See Levin, Column 4, lines 29-31) This statement is another clear indication that Levin is totally unconcerned with the modality of the user interaction and is simply teaching a single modal approach via queries and answers.

As discussed during the Examiner Interview, the support cited by the Examiner in the Final Office Action only discloses the teaching that the user is requested to provide additional information, but it does not require the user to provide the additional inputs in **a different modality than the original request** as claimed by the Applicants. The Examiners indicated that they would reconsider the present rejections.

Therefore, the Applicants respectfully submit that independent claims 56, 82 and 101 are not anticipated by the Levin reference. As such, claims 56, 82 and 101 fully satisfy the requirements of 35 U.S.C. §102 and are patentable thereunder.

Claims 57-81, 83-100 and 102-126 depend, either directly or indirectly, from claims 56, 82 and 101 and recite additional features therefor. Since Levin fails to anticipate Applicants' invention as recited in Applicants' independent claims 56, 82 and 101, dependent claims 57-81, 83-100 and 102-126 are also not anticipated under 35 U.S.C. § 102 and are allowable for the same reason noted above.

Conclusion

Thus, the Applicants submit that all of these claims now fully satisfy the requirements of 35 U.S.C. §102. Consequently, the Applicants believe that all these claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues requiring the maintenance of the present final office action in any of the claims now pending in the application, it is requested that the Examiner telephone Mr. Kin-Wah Tong, Esq. at

09/524,095

(732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

1/10/02

Kin-Wah Tong, Attorney
Reg. No. 39,400
(732) 530-9404

Moser, Patterson & Sheridan, LLP
595 Shrewsbury Avenue
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TELEFAX COVER SHEET

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TO: Assistant Commissioner of Patents

FAX NO.: 703-746-7238

FROM: Kin-Wah Tong

DATE: January 10, 2002

MATTER: Serial No. 09/524,095 Filed: March 13, 2000

DOCKET NO.: SRI 1P037

APPLICANT: HALVERSON, et al

The following has been received in the U.S. Patent and Trademark Office on the date of this facsimile:

- ___ Petition
- ___ Disclosure Statement & PTO-1449
- ___ Priority Document
- ___ Drawings (____ sheets) informal
- X Response Under 37 CFR 1.116
- X Transmittal Letter (2 copies)
- ___ Fee Transmittal (2 copies)
- ___ Deposit Account Transaction
- X Facsimile Transmission Certificate dated January 10, 2002

CERTIFICATE OF TRANSMISSION UNDER 37 C.F.R. §1.6

I hereby certify that this correspondence is being transmitted by facsimile to the Assistant Commissioner for Patents, Box AF, Washington, DC 20231 on January 10, 2002, Facsimile No. 703-746-7238.

Linda DeNardi
Name of person signing this certificate

Linda DeNardi January 10, 2002
Signature and date

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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	09/524,095
Filing Date	March 13, 2000
First Named Inventor	HALVERSON
Group Art Unit	2155
Examiner Name	F. BACKER
Attorney Docket Number	SRI 1 P 037
Total Number of Pages In This Submission	9

ENCLOSURES *(check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☒ Amendment / Response
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Response to Missing Parts/ Incomplete Application
  - ☐ Response to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Assignment Papers *(for an Application)*
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s)
- ☐ After Allowance Communication to Group
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☐ Appeal Communication to Group *(Appeal Notice, Brief, Reply Brief)*
- ☐ Proprietary Information
- ☐ Status Letter
- ☐ Other Enclosure(s) *(please identify below)*:

Remarks	**It is believed no fee is due. However, in the event a fee is due, kindly charge that fee to deposit account number 20-0782. To facilitate that charge, a duplicate copy of this letter is enclosed**

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm *or* Individual name	PATRICIA A. VERLANGIERI, Reg. No. 42,201
Signature	Patricia A. Verlangieri
Date	January 10, 2002

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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

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Filing Date	March 13, 2000
First Named Inventor	HALVERSON
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- ☒ Amendment / Response
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SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	PATRICIA A. VERLANGIERI, Reg. No. 42,201
Signature	Patricia A. Verlangieri
Date	January 10, 2002

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/524,095	03/13/2000	Christine Halverson	SRI1P037	6294

25696 7590 02/19/2002

OPPENHEIMER WOLFF & DONNELLY
P. O. BOX 10356
PALO ALTO, CA 94303

EXAMINER	
BACKER, FIRMIN	
ART UNIT	PAPER NUMBER
2155	23

DATE MAILED: 02/19/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

Advisory Action	Application No.	Applicant(s)	
	09/524,095	HALVERSON ET AL.	
	Examiner	Art Unit	
	Firmin Backer	2155	

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 07 January 2002 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE. Therefore, further action by the applicant is required to avoid abandonment of this application. A proper reply to a final rejection under 37 CFR 1.113 may only be either: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114.

PERIOD FOR REPLY [check either a) or b)]

a) ☒ The period for reply expires 3 months from the mailing date of the final rejection.

b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.
ONLY CHECK THIS BOX WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

1.☐ A Notice of Appeal was filed on ____. Appellant's Brief must be filed within the period set forth in 37 CFR 1.192(a), or any extension thereof (37 CFR 1.191(d)), to avoid dismissal of the appeal.

2.☐ The proposed amendment(s) will not be entered because:

(a) ☐ they raise new issues that would require further consideration and/or search (see NOTE below);

(b) ☐ they raise the issue of new matter (see Note below);

(c) ☐ they are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or

(d) ☐ they present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: ____.

3.☐ Applicant's reply has overcome the following rejection(s): ____.

4.☐ Newly proposed or amended claim(s) ____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).

5.☒ The a)☐ affidavit, b)☐ exhibit, or c)☒ request for reconsideration has been considered but does NOT place the application in condition for allowance because: *See Continuation Sheet*.

6.☐ The affidavit or exhibit will NOT be considered because it is not directed SOLELY to issues which were newly raised by the Examiner in the final rejection.

7.☒ For purposes of Appeal, the proposed amendment(s) a)☐ will not be entered or b)☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.

The status of the claim(s) is (or will be) as follows:

Claim(s) allowed: ____.

Claim(s) objected to: ____.

Claim(s) rejected: 56-126

Claim(s) withdrawn from consideration: ____.

8.☐ The proposed drawing correction filed on ____ is a)☐ approved or b)☐ disapproved by the Examiner.

9.☐ Note the attached Information Disclosure Statement(s)(PTO-1449) Paper No(s). ____.

10.☐ Other: ____

Continuation of 5. does NOT place the application in condition for allowance because: Applicant request for reconsideration has been considered but does not place the application in condition for allowance. Applicant argues that Levin fail to teach the limitation of soliciting additional input from the user, including user interaction in a modality different than the original request. Examiner respectfully disagree with applicant characterization of Levin et al' inventive concept. As examiner has indicated before, Levin et al teach a system and method of using natural language to retrieve information. In that particular if the service host 112, based on the rules, decides that there is enough information for performing a database access, the database query is generated. The database query is generally in one of the standard query languages (e.g. SQL). The service host 112 also determines if there are any ambiguities with respect to the response (step 222) and, if so, forwards additional queries to the user to help to resolve the ambiguities (step 224). The service host 112 then sends the responses to the information server 110 (step 226). If there are too many potential answers (for instance if there are two pizza places on Main Street in Westfield), one or more questions to the user are generated in order to disambiguate the query (e.g. Do you mean "Venezia" or "Bella Roma?"). The answers to the additional questions are used to formulate a new logical search query. For this there might be additional rules like: if(Action_Object=Pizza_Restaurant and Too-Many_Answers) then User must provide further clarifying information such as, for example, the name of restaurant OR exact address. If the user does not provide enough information to achieve a single answer, the service host 112 might then list the possibilities and ask the user to choose one of them (see column 6 lines 28-59). Levin cleary indicate that in the user does not provide enough information to achieve a sinlge answer then the service host might the list the possibilites and ask the user to chose on of them. To the examiner that is a different modality then the original mode. It can be seen that in the original mode, the user was requesting the service. In this mode, the host provides a list of service for the user to choose from. In the original mode, the user did not have any choices, however, in this mode the user has a list to choose from. Therefore, the final action is sustained.

AYAZ SHEIKH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/524,095	03/13/2000	Christine Halverson	SRI1P037	6294

7590 04/03/2002

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SHREWSBURY, NJ 07702

EXAMINER	
BACKER, FIRMIN	
ART UNIT	**PAPER NUMBER**
2161	

DATE MAILED: 04/03/2002

#24

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

Supplemental Advisory Action	Application No. 09/524,095	Applicant(s) HALVERSON ET AL.	
	Examiner Firmin Backer	Art Unit 2155	

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 07 January 2002 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE. Therefore, further action by the applicant is required to avoid abandonment of this application. A proper reply to a final rejection under 37 CFR 1.113 may only be either: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114.

PERIOD FOR REPLY [check either a) or b)]

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1.☐ A Notice of Appeal was filed on _____. Appellant's Brief must be filed within the period set forth in 37 CFR 1.192(a), or any extension thereof (37 CFR 1.191(d)), to avoid dismissal of the appeal.

2.☐ The proposed amendment(s) will not be entered because:

(a) ☐ they raise new issues that would require further consideration and/or search (see NOTE below);

(b) ☐ they raise the issue of new matter (see Note below);

(c) ☐ they are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or

(d) ☐ they present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: _____.

3.☐ Applicant's reply has overcome the following rejection(s): _____.

4.☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).

5.☒ The a)☐ affidavit, b)☐ exhibit, or c)☒ request for reconsideration has been considered but does NOT place the application in condition for allowance because: *See Continuation Sheet*.

6.☐ The affidavit or exhibit will NOT be considered because it is not directed SOLELY to issues which were newly raised by the Examiner in the final rejection.

7.☒ For purposes of Appeal, the proposed amendment(s) a)☐ will not be entered or b)☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.

The status of the claim(s) is (or will be) as follows:

Claim(s) allowed: _____.

Claim(s) objected to: _____.

Claim(s) rejected: *56-126*.

Claim(s) withdrawn from consideration: _____.

8.☐ The proposed drawing correction filed on _____ is a)☐ approved or b)☐ disapproved by the Examiner.

9.☐ Note the attached Information Disclosure Statement(s)(PTO-1449) Paper No(s). _____.

10.☐ Other: _____

JAMES P. TRAMMELL
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

Continuation of 5. does NOT place the application in condition for allowance because: Applicant request for reconsideration has been considered but does not place the application in condition for allowance. Applicant argues that Levin fail to teach the limitation of soliciting additional input from the user, including user interaction in a modality different than the original request. Examiner respectfully disagree with applicant characterization of Levin et al' inventive concept. As examiner has indicated before, Levin et al teach a system and method of using natural language to retrieve information. In that particular if the service host 112, based on the rules, decides that there is enough information for performing a database access, the database query is generated. The database query is generally in one of the standard query languages (e.g. SQL). The service host 112 also determines if there are any ambiguities with respect to the response (step 222) and, if so, forwards additional queries to the user to help to resolve the ambiguities (step 224). The service host 112 then sends the responses to the information server 110 (step 226). If there are too many potential answers (for instance if there are two pizza places on Main Street in Westfield), one or more questions to the user are generated in order to disambiguate the query (e.g. Do you mean "Venezia" or "Bella Roma?"). The answers to the additional questions are used to formulate a new logical search query. For this there might be additional rules like: if(Action_Object=Pizza_Restaurant and Too-Many_Answers) then User must provide further clarifying information such as, for example, the name of restaurant OR exact address. If the user does not provide enough information to achieve a single answer, the service host 112 might then list the possibilities and ask the user to choose one of them (see column 6 lines 28-59). Levin cleary indicate that in the user does not provide enough information to achieve a sinlge answer then the service host might the list the possibilites and ask the user to chose on of them. To the examiner that is a different modality then the original mode. It can be seen that in the original mode, the user was requesting the service. In this mode, the host provides a list of service for the user to choose from. In the original mode, the user did not have any choices, however, in this mode the user has a list to choose from. Therefore, the final action is sustained.

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PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)	Docket Number (Optional) SRI 1P037

O I P E JC98
APR 1 0 2002
PATENT & TRADEMARK OFFICE

#25 LDJ 4-16-02

In re Application of HALVERSON	
Application Number 09/524,095	Filed March 13, 2000
For Navigating Network-Based Electronic Information Using Spoken Natural Language Input With Multimodal Error Feedback	
Group Art Unit 2155	Examiner F. Backer

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a response in the above identified application.

The requested extension and appropriate non-small-entity fee are as follows (check time period desired):

- ☐ One month (37 CFR 1.17(a)(1)) $
- ☒ Two months (37 CFR 1.17(a)(2)) $400.00
- ☐ Three months (37 CFR 1.17(a)(3)) $
- ☐ Four months (37 CFR 1.17(a)(4)) $
- ☐ Five months (37 CFR 1.17(a)(5)) $

☒ Applicant claims small entity status. See 37 CFR 1.27. Therefore, the fee amount shown above is reduced by one-half, and the resulting fee is: $ 200.00 .

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Commissioner has already been authorized to charge fees in this application to a Deposit Account.

☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 20-0782 .
I have enclosed a duplicate copy of this sheet.

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APR 1 2 2002
Technology Center 2100

I am the ☐ applicant/inventor.

☐ assignee of record of the entire interest. See 37 CFR 3.71
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).

☒ attorney or agent of record.

☐ attorney or agent under 37 CFR 1.34(a).

Registration number if acting under 37 CFR 1.34(a). ______ .

04/17/2002 LJOHNSON 00000001 200782 09524095
01 FC:217 260.00 CH

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

April 10, 2002
Date

Signature

KIN-WAH TONG
Typed or printed name

04/12/2002 AWONDAF1 00000141 200782 09524095
02 FC:216 200.00 CH

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of _____ forms are submitted.

Burden Hour Statement: This form is estimated to take 0.1 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

04-11-02

RCE / 2700 #

OIPE JC96 APR 1 0 2002 PATENT & TRADEMARK OFFICE

PTO/SB/30 (8/2000)
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U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

#26

LDJ 4-16-0

REQUEST FOR CONTINUED EXAMINATION (RCE) TRANSMITTAL

Subsection (b) of 35 U.S.C. § 132, effective on May 29, 2000, provides for continued examination of a utility or plant application filed on or after June 8, 1995, See the American Inventors Protection Act of 1999 (AIPA).

Application Number	09/524,095
Filing Date	March 13, 2000
First Named Inventor	HALVERSON
Group Art Unit	2155
Examiner Name	F. Backer
Attorney Docket Number	SRI 1P037

This is a Request for Continued Examination (RCE) under 37 C.F.R. § 1.114 of the above-identified application.
NOTE: 37 C.F.R. § 1.114 is effective on May 29, 2000. If the above-identified application was filed prior to May 29, 2000, applicant may wish to consider filing a continued prosecution application (CPA) under 37 C.F.R. § 1.53 (d) (PTO/SB/29) instead of an RCE to be eligible for the patent term adjustment provisions of the AIPA. See Changes to Application Examination and Provisional Application Practice, Final Rule, 65 Fed. Reg. 50092 (Aug. 16, 2000); Interim Rule, 65 Fed. Reg. 14865 (Mar. 20, 2000), 1233 Off. Gaz. Pat. Office 47 (Apr. 11, 2000), which established RCE Practice.

1. Submission required under 37 C.F.R. § 1.114.
   - a. ☐ Previously submitted
     - i. ☐ Consider the amendment(s)/reply under 37 C.F.R. § 1.116 previously filed on ______
     - ii. ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on ______
     - iii. ☐ Other ______
   - b. ☒ Enclosed
     - i. ☐ Amendment/Reply
     - ii. ☐ Affidavit(s)/Declaration(s)
     - iii. ☐ Information Disclosure Statement (IDS)
     - iv. ☒ Other **Preliminary Amendment**

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2. Miscellaneous
   - a. ☐ Suspension of action on the above-identified application is requested under 37 C.F.R. § 1.103(c) for a period of ______ months (Period of suspension shall not exceed 3 months; Fee under 37 C.F.R.§ 1.17(i) required)
   - b. ☐ Other
3. Fees The RCE fee under 37 C.F.R. § 1.17(e) is required by 37 C.F.R. § 1.114 when the RCE is filed.
   - a. ☒ The Director is hereby authorized to charge the following fees, or credit any overpayments, to Deposit Account No. 20-0782
     - i. ☒ RCE fee required under 37 C.F.R. § 1.17(e)
     - ii. ☒ Extension of time fee (37 C.F.R. §§ 1.136 and 1.17)
     - iii. ☐ Other ______
   - b. ☐ Check in the amount of $ ______ enclosed
   - c. ☐ Payment by credit card (Form PTO-2038 enclosed)

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

Name (Print / Type)	KIN-WAH TONG	*Registration No. (Attorney / Agent)*	39,400
Signature	K. Wah Tong	*Date*	April 10, 2002

04/12/2002 AWONDAF1 00000141 200782 09524095

01 FC:179 370.00 CH

PTO/SB/30 (8/2000)
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REQUEST FOR CONTINUED EXAMINATION (RCE) TRANSMITTAL

OIPE JC98 APR 1 0 2002 PATENT & TRADEMARK OFFICE

Subsection (b) of 35 U.S.C. § 132, effective on May 29, 2000, provides for continued examination of a utility or plant application filed on or after June 8, 1995.
See the American Inventors Protection Act of 1999 (AIPA).

Application Number	09/524,095
Filing Date	March 13, 2000
First Named Inventor	HALVERSON
Group Art Unit	2155
Examiner Name	F. Backer
Attorney Docket Number	SRI 1P037

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1. Submission required under 37 C.F.R. § 1.114.
   a. ☐ Previously submitted
      i. ☐ Consider the amendment(s)/reply under 37 C.F.R. § 1.116 previously filed on ______
      ii. ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on ______
      iii. ☐ Other ______
   b. ☒ Enclosed
      i. ☐ Amendment/Reply
      ii. ☐ Affidavit(s)/Declaration(s)
      iii. ☐ Information Disclosure Statement (IDS)
      iv. ☒ Other **Preliminary Amendment**

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   b. ☐ Other
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   a. ☒ The Director is hereby authorized to charge the following fees, or credit any overpayments, to Deposit Account No. **20-0782**
      i. ☒ RCE fee required under 37 C.F.R. § 1.17(e)
      ii. ☒ Extension of time fee (37 C.F.R. §§ 1.136 and 1.17)
      iii. ☐ Other ______
   b. ☐ Check in the amount of $ ______ enclosed
   c. ☐ Payment by credit card (Form PTO-2038 enclosed)

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

Name (Print/Type)	KIN-WAH TONG	Registration No. (Attorney/Agent)	39,400
Signature	K. Wah Tong	Date	April 10, 2002

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND Fees and Completed Forms to the following address: Assistant Commissioner for Patents, Box RCE, Washington, DC 20231.

09/524,095

APR 1 0 2002

IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE

PATENT APPLICATION

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APR 1 2 2002
Technology Center 2100

Applicant: **Halverson et al.**

Case: **SRI1P037**

Serial No.: **09/524,095** Filed: **March 13, 2000**

Group Art Unit: **2155**

Examiner: **Firmin Backer**

Title: **NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK**

ASSISTANT COMMISSIONER FOR PATENTS
Box RCE
Washington, D. C. 20231

S I R:

Please be advised that the enclosed RCE and Preliminary Amendment are filed with a two-month extension request instead of a three-month extension request. The reason is that the Advisory Action dated February 19, 2002 was erroneously forwarded to a different law firm by the USPTO. This error was communicated to Examiner Backer and the Examiner subsequently issued a supplemental Advisory Action to the Applicants' representative on April 3, 2002. As such, Applicants have informed the Examiner that the enclosed RCE and Preliminary Amendment will be filed with a two-month extension request instead of a three-month extension request.

However, in the event that a three-month extension request is required, Applicants' representative hereby requests for a three-month extension request and authorizes the payment of the necessary extension fee via **Deposit Account: 20-0782.**

09/524,095

OIPE JC95
APR 1 0 2002
PATENT & TRADEMARK OFFICE

4/10/02

Respectfully submitted,

Kin-Wah Tong, Attorney
Reg. No. 39,400
(732) 530-9404

Moser, Patterson & Sheridan, LLP
595 Shrewsbury Avenue
First Floor,
Shrewsbury, New Jersey 07702

EXPRESS MAIL CERTIFICATION

"Express Mail" mailing label number EL 849341069 US

Date of deposit APRIL 10, 2002

I hereby certify that this paper and/or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to Assistant Commissioner of Patents, BOX RCE, Washington, D.C. 20231.

Linda DeNardi

Signature of person mailing paper or fee

Linda DeNardi

Name of person mailing paper or fee

09/524,095

IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE

PATENT APPLICATION

Applicant: **Halverson et al.**

Case: **SRI1P037**

Serial No.: **09/524,095** Filed: **March 13, 2000**

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However, in the event that a three-month extension request is required, Applicants' representative hereby requests for a three-month extension request and authorizes the payment of the necessary extension fee via **Deposit Account: 20-0782**.

09/524,095

Respectfully submitted,

4/10/02

Kin-Wah Tong, Attorney
Reg. No. 39,400
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Moser, Patterson & Sheridan, LLP
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Shrewsbury, New Jersey 07702

OIPE JC95
APR 1 0 2002
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Date of deposit APRIL 10, 2002

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Linda DeNardi

Signature of person mailing paper or fee

Linda DeNardi

Name of person mailing paper or fee

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09/524,095

OIPE APR 1 0 2002 JC96 PATENT & TRADEMARK OFFICE

#27/ LDJ 4-16-02 entered

IN THE UNITED STATES
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PATENT APPLICATION

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APR 1 2 2002
Technology Center 2100

Applicant: **Halverson et al.**

Case: **SRI1P037**

Serial No.: **09/524,095** Filed: **March 13, 2000**

Group Art Unit: **2155**

Examiner: **Firmin Backer**

Title: **NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK**

ASSISTANT COMMISSIONER FOR PATENTS
Box RCE
Washington, D. C. 20231

S I R:

Preliminary Amendment

This Preliminary Amendment is filed in conjunction with an RCE and addresses the Advisory Action dated April 3, 2002.

IN THE CLAIMS

Please amend claims 56, 82, and 101 as shown below. The claims are "clean version" of the amended claims, i.e., with changes incorporated into the claims, whereas the Appendix to this Amendment illustrates the amended claims using underlines and brackets to indicate addition and deletion, respectively.

---

56. (Amended) A method for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising the steps of:

C1

(a) receiving a spoken request for desired information from the user;

(b) rendering an interpretation of the spoken request;

(c) constructing at least part of a navigation query based upon the interpretation;

(d) soliciting additional input from the user, including user interaction in a non-spoken modality different than the original request;

C1

(e) refining the navigation query, based upon the additional input;

(f) using the refined navigation query to select a portion of the electronic data source; and

end

(g) transmitting the selected portion of the electronic data source from the network server to a client device of the user.

---

82. (Amended) A system for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, the system comprising:

(a) a portable microphone operable to receive a spoken request for desired information from the user;

(b) language processing logic, operable to render an interpretation of the spoken request;

(c) query construction logic, operable to construct a navigation query in response to the interpretation of the spoken request;

C2

(d) user interaction logic, operable to solicit additional input from the user, including user interaction in a non-spoken modality different than the original request;

(e) query refining logic, operable to refine the navigation query, based upon the additional input;

(f) navigation logic, operable to select a portion of the electronic data source using the navigation query; and

(g) electronic communications infrastructure for transmitting the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user.

---

101. A computer program embodied on a computer readable medium for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising:

(a) a code segment that receives a spoken request for desired information from the user;

(b) a code segment that renders an interpretation of the spoken request;

(c) a code segment that constructs at least part of a navigation query based upon the interpretation;

(d) a code segment that solicits additional input from the user, including user interaction in a non-spoken modality different than the original request;

(e) a code segment that refines the navigation query, based upon the additional input;

(f) a code segment that uses the refined navigation query to select a portion of the electronic data source; and

(g) a code segment that transmits the selected portions of the electronic data source from the network server to a primarily stationary, display device located locally with the user.

REMARKS

In view of the above Amendment and the following discussion, the Applicants submit that none of the claims now pending in the application are anticipated under the provisions of 35 U.S.C. § 102. Thus, the Applicants believe that all of these claims are now in allowable form.

I. REJECTION OF CLAIMS 56-126 UNDER 35 U.S.C. § 102

The Examiner has rejected claims 56-126 in Paragraphs 2-34 of the Final Office Action and in the Advisory Action as being anticipated by the Levin et al. patent (US Patent 6,173,279 issued January 9, 2001, hereinafter referred to as Levin). The rejection is respectfully traversed.

Levin teaches "a method of using at least one natural language query to retrieve information from one or more data resources and further performing a requested action using the retrieved information is disclosed". (See Levin, Column 2, lines 15-18) Namely, Levin teaches a method for using natural language query to obtain information, where upon receipt of the requested information, a desired action is executed based upon the requested information. To illustrate, Levin provides the example, where a user employs natural language to request the telephone number of a restaurant. Upon receipt of the telephone number, the telephone number is actually dialed for the user. (See Levin, Column 3 line 62 to Column 4, line 1)

In contrast, Levin fails to teach or suggest the novel concept of speech-based navigation where the method solicits additional input from the user, including user interaction in a non-spoken modality different than the original request. Specifically, Applicants' amended independent claims 56, 82 and 101 positively recite:

56. A method for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising the steps of:

(a) receiving a spoken request for desired information from the user;
(b) rendering an interpretation of the spoken request;
(c) constructing at least part of a navigation query based upon the interpretation;
(d) soliciting additional input from the user, including user interaction in a non-spoken modality different than the original request;
(e) refining the navigation query, based upon the additional input;
(f) using the refined navigation query to select a portion of the electronic data source; and
(g) transmitting the selected portion of the electronic data source from the network server to a client device of the user. (emphasis added)

82. A system for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, the system comprising:

(a) a portable microphone operable to receive a spoken request for desired information from the user;

(b) language processing logic, operable to render an interpretation of the spoken request;

(c) query construction logic, operable to construct a navigation query in response to the interpretation of the spoken request;

(d) <u>user interaction logic, operable to solicit additional input from the user, including user interaction in a non-spoken modality different than the original request</u>;

(e) query refining logic, operable to refine the navigation query, based upon the additional input;

(f) navigation logic, operable to select a portion of the electronic data source using the navigation query; and

(g) electronic communications infrastructure for transmitting the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user. (emphasis added)

101. A computer program embodied on a computer readable medium for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising:

(a) a code segment that receives a spoken request for desired information from the user;

(b) a code segment that renders an interpretation of the spoken request;

(c) a code segment that constructs at least part of a navigation query based upon the interpretation;

<u>(d)a code segment that solicits additional input from the user, including user interaction in a non-spoken modality different than the original request</u>;

(e) a code segment that refines the navigation query, based upon the additional input;

(f) a code segment that uses the refined navigation query to select a portion of the electronic data source; and

(g) a code segment that transmits the selected portions of the electronic data source from the network server to a primarily stationary, display device located locally with the user. (emphasis added)

Applicants direct the Examiner's attention to the fact that Applicants' invention teaches a novel method and apparatus for speech-based navigation <u>where the method solicits additional input from the user, including user interaction</u> <u>**in a non-spoken modality different than the original request**</u>. Specifically, Applicants address the criticality of errors and deficiencies via user interface modalities in addition to spoken natural language. It has been observed that users are often frustrated by ineffective or non optimal speech-based navigation that simply engages the user repeatedly in a long series of questions and answers, i.e., "single modal interaction", to perfect the navigation query. This single modal approach is often tedious and uninspiring for a user who must refine the navigation query repeatedly to achieve the desired result, thereby increasing the time the user must interact with a system. In fact, one goal of the speech-based navigation is to relieve this very tedium where the user must engage a system repeatedly, e.g., via a long sequence of menus to achieve the desired result.

To address this criticality, Applicants' navigation query can be refined via input from the user, where the user interaction is in a non-spoken modality different than the original request. To illustrate, if a portion of the navigation query can be achieved, then the result can be presented to the user in a way that the user can provide additional input via interaction that is in a non-spoken modality that is different than the original request. For example, if the "partial" navigation query produces three possible results, then the results can be presented to the user via a menu with the most likely result being highlighted. The user can then press a button on a remote unit to accept the highlighted result or simply scroll to one of the other three choices. Thus, the pressing of the button by the user is a **user interaction that is in a non-spoken modality different than the original request, e.g., a natural language request that originally started the navigation request**. This is an important aspect of the invention because of the psychological and real effect where the user perceives that the navigation query is actually progressing closer to the achieved result.

In contrast, Levin teaches that "the service host 112 determines if there are any ambiguities with respect to the response (step 222) and, if so, forwards **additional queries** to the user to help to resolve the ambiguities (step 224)". (emphasis added) (See Levin, Column 6, lines 40-43). Additionally, Levin states that "[t]he service host 112 includes a dialog control program that manages interactions with users **over several turns (e.g., it decides when to ask a question, when to give an answer**, provides means for clarifying ambiguities, and provides error control and recovery during an interaction)". (emphasis added) (See Levin, Column 5, lines 15-20). Levin's single modal approach is contrary to Applicants' invention and is one of the criticalities that Applicants' invention is designed to address. To further support Applicants' position, Levin states that "[t]he invention is independent of the actual modality of call placement". (See Levin, Column 4, lines 29-31) This statement is another clear indication that Levin is totally unconcerned with the modality of the user interaction and is simply teaching a single modal approach via queries and answers.

However, the Examiner in the Advisory Action indicated that Levin's teaching of forwarding additional queries to the user constitutes a different modality. Applicants do not believe that the scope of Applicants' originally filed claims would read on this broad interpretation of different modality. Nevertheless, Applicants have agreed to clarify the independent claims to recite the term "a non-spoken modality different than the original request". The Examiner in several telephone conversations with Applicants' representative have indicated that this clarification will likely overcome the present rejection.

Additionally, it should be noted that this amendment is **not** made to overcome the cited prior art because it is Applicants' belief that the originally filed claims would not read on the invention disclosed by Levin. Thus, this clarifying amendment should not be interpreted in a manner that would limit the future application of Doctrine of Equivalents to Applicants' claims.

Therefore, the Applicants respectfully submit that independent claims 56, 82 and 101 are not anticipated by the Levin reference. As such, claims 56, 82 and 101 fully satisfy the requirements of 35 U.S.C. §102 and are patentable thereunder.

Claims 57-81, 83-100 and 102-126 depend, either directly or indirectly, from claims 56, 82 and 101 and recite additional features therefor. Since Levin fails to anticipate Applicants' invention as recited in Applicants' amended independent claims 56, 82 and 101, dependent claims 57-81, 83-100 and 102-126 are also not anticipated under 35 U.S.C. § 102 and are allowable for the same reason noted above.

II. Claims added in Preliminary Amendment dated September 12, 2000

Applicants have previously directed the Examiner's attention to the fact that it appears that the additional claims added in the Preliminary Amendment dated September 12, 2000 have not be addressed. Applicants respectfully request that the Examiner should verify the status of these added claims.

Conclusion

Thus, the Applicants submit that all of these claims now fully satisfy the requirements of 35 U.S.C. §102. Consequently, the Applicants believe that all these claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues requiring the maintenance of the present final office action in any of the claims now pending in the application, it is requested that the Examiner telephone Mr. Kin-Wah Tong, Esq. at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

4/10/02

Kin-Wah Tong, Attorney
Reg. No. 39,400
(732) 530-9404

Moser, Patterson & Sheridan, LLP
595 Shrewsbury Avenue
First Floor,
Shrewsbury, New Jersey 07702

Appendix
(Marked-up version of amended claims)

56. (Amended) A method for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising the steps of:

(a) receiving a spoken request for desired information from the user;

(b) rendering an interpretation of the spoken request;

(c) constructing at least part of a navigation query based upon the interpretation;

(d) soliciting additional input from the user, including user interaction in a <u>non-spoken</u> modality different than the original request;

(e) refining the navigation query, based upon the additional input;

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(f) a code segment that uses the refined navigation query to select a portion of the electronic data source; and

(g) a code segment that transmits the selected portions of the electronic data source from the network server to a primarily stationary, display device located locally with the user.

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FEE TRANSMITTAL for FY 2002

OIPE JC95 APR 1 0 2002 PATENT & TRADEMARK OFFICE

Patent fees are subject to annual revision.

TOTAL AMOUNT OF PAYMENT ($) 570.00

Complete If Known	
Application Number	09/524,095
Filing Date	March 13, 2000
First Named Inventor	Halverson
Examiner Name	F. Backer
Group / Art Unit	2155
Attorney Docket No.	SRI 1P037

RECEIVED APR 1 2 2002 Technology Center 2100

METHOD OF PAYMENT (check one)

1. ☒ The Commissioner is hereby authorized to charge indicated fees and credit any over payments to:

Deposit Account Number: 20-0782

Deposit Account Name: Moser, Patterson & Sheridan, LLP

☒ Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17

☒ Applicant claims small entity status. See 37 CFR 1.27

2. ☐ Payment Enclosed:

☐ Check ☐ Credit card ☐ Money Order ☐ Other

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
101	740	201	370	Utility filing fee	
106	330	206	165	Design filing fee	
107	510	207	255	Plant filing fee	
108	740	208	370	Reissue filing fee	
114	160	214	80	Provisional filing fee	

SUBTOTAL (1) ($) 0

2. EXTRA CLAIM FEES

			Extra Claims		Fee from below		Fee Paid
Total Claims		-20 ** =	0	X		=	0
Independent Claims		-3 ** =	0	X		=	0
Multiple Dependent				X		=	0

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description
103	18	203	9	Claims in excess of 20
102	84	202	42	Independent claims in excess of 3
104	280	204	140	Multiple dependent claim, if not paid
109	84	209	42	** Reissue independent claims over original patent
110	18	210	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) ($) 0

**or number previously paid, if greater; For Reissues, see above

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
105	130	205	65	Surcharge - late filing fee or oath	
127	50	227	25	Surcharge - late provisional filing fee or cover sheet.	
139	130	139	130	Non-English specification	
147	2,520	147	2,520	For filing a request for reexamination	
112	920*	112	920*	Requesting publication of SIR prior to Examiner action	
113	1,840*	113	1,840*	Requesting publication of SIR after Examiner action	
115	110	215	55	Extension for reply within first month	
116	400	216	200	Extension for reply within second month	
117	920	217	460	Extension for reply within third month	200.00
118	1,440	218	720	Extension for reply within fourth month	
128	1,960	228	980	Extension for reply within fifth month	
119	320	219	160	Notice of Appeal	
120	320	220	160	Filing a brief in support of an appeal	
121	280	221	140	Request for oral hearing	
138	1,510	138	1,510	Petition to institute a public use proceeding	
140	110	240	55	Petition to revive – unavoidable	
141	1,280	241	640	Petition to revive – unintentional	
142	1,280	242	640	Utility issue fee (or reissue)	
143	460	243	230	Design issue fee	
144	620	244	310	Plant issue fee	
122	130	122	130	Petitions to the Commissioner	
123	50	123	50	Processing fee under 37 CFR 1.17 (q)	
126	180	126	180	Submission of Information Disclosure Stmt	
581	40	581	40	Recording each patent assignment per property (times number of properties)	
146	740	246	370	Filing a submission after final rejection (37 CFR § 1.129(a))	
149	740	249	370	For each additional invention to be examined (37 CFR § 1.129(b))	
179	740	279	370	Request for Continued Examination (RCE)	370.00
169	900	169	900	Request for expedited examination of a design application	

Other fee (specify)

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) ($) 570.00

SUBMITTED BY				Complete (if applicable)	
Name (Print/Type)	KIN-WAH TONG	Registration No. Attorney/Agent)	39,400	Telephone	(732)530-9404
Signature				Date	APRIL 10, 2002

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/524,095	03/13/2000	Christine Halverson	SRI1P037	6294

7590 05/07/2002

THOMASON, MOSER & PATTERSON, LLP
595 SHREWSBURY AVENUE
SUITE 100
SHREWSBURY, NJ 07702

EXAMINER	
BACKER, FIRMIN	
ART UNIT	PAPER NUMBER
3621	

DATE MAILED: 05/07/2002

#28

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

Office Action Summary	Application No.	Applicant(s)
	09/524,095	HALVERSON ET AL.
	Examiner	Art Unit
	Firmin Backer	3621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 10 April 2002.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 56-126 is/are pending in the application.

4a) Of the above claim(s) ____ is/are withdrawn from consideration.

5)☐ Claim(s) ____ is/are allowed.

6)☒ Claim(s) 56-126 is/are rejected.

7)☐ Claim(s) ____ is/are objected to.

8)☐ Claims ____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on ____ is/are objected to by the Examiner.

11)☐ The proposed drawing correction filed on ____ is: a)☐ approved b)☐ disapproved.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. ____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15)☐ Notice of References Cited (PTO-892)

16)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

17)☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ .

18)☐ Interview Summary (PTO-413) Paper No(s). ____ .

19)☐ Notice of Informal Patent Application (PTO-152)

20)☐ Other:

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 10th, 2002 has been entered.

Response to Arguments

1. Applicant's arguments with respect to claims 56-126 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 56-126 are rejected under 35 U.S.C. 103(a) as being unpatentable over Levin et al. (U.S. Patent No. 6,173,279) in view of French-St. George et al (U.S. Patent 6,012,030 *(applicant submitted IDS))*.

4. As per claim 56, Levin et al teach a method for speech-based navigation (*information server, 110)* of an electronic data source located at one or more network servers located remotely

from a user, (*see abstract, fig 1, column 3 lines 5-35*), comprising receiving a spoken request (*receive a natural language query*) for desired information from the user (*user*); rendering an interpretation (*creating a semantic representation*) of the spoken request, constructing a navigation (*generating search)* query based upon the interpretation, refining the navigation query, based upon the additional input (*see column 6 lines 20-59*), using the navigation query to select a portion of the electronic data source and transmitting the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user (*see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claims 1, 10, 22*). Levin et al fail to teach an inventive concept of soliciting additional input from the user including user interaction in a non-spoken modality different that the original request. However, French-St. George et al. teach inventive concept of soliciting additional input from the user including user interaction in a non-spoken modality different that the original request (*see column 9 lines 36-65).* Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Levin et al's inventive concept to include French-St. George et al's inventive concept of soliciting additional input from the user including user interaction in a non-spoken modality different that the original request because this would have avoided or reduces error as the system search for user request thereby enhance the flexibility and the efficiency of the system.

5. As per claim 57, Levin et al teach a method of rendering the interpretation includes deriving linguistic information by using a speech recognition and a linguistic parser (see abstract, fig 1, column 3 lines 37-5 lines 40).

6. As per claim 58-62, Levin et al teach a method of constructing a navigation query in the form of a database query on a computing device located on a network including extracting an input template for an online scripted interface to the data source to be used for the construction of the navigation query and dynamically scraping the online scripted interface (see abstract, fig. 1-3, column 3 line 36-9 line 5)

7. As per claim 63-68, Levin et al teach a method of soliciting additional input is performed in response deficiency including unresolved word encountered after the first navigation of the data source, required element of the navigational query, data recorded within the data source, failure to identify data record responsive to navigational query (see column 6 lines 20-59).

8. As per claim 69, Levin et al teach a method wherein the additional input is solicited upon receiving a user-input statement...(see column 6 lines 20-59).

9. As per claim 70-73, Levin et al teach a method of soliciting additional input from the user, including presenting: a menu, a textual or an audible request, a list of portions of data source (see abstract, fig. 1-3, column 3 line 36-9 line 5).

10. As per claim 74-75, Levin et al teach a method wherein additional input received from the user is speech based, of no spoken input source (see abstract, fig. 1-3, column 3 line 36-9 line 5).

11. As per claim 76, Levin et al teach a method wherein steps (d)-(e) are repeated until the navigational query if deemed adequate source (see abstract, fig. 1-3, column 3 line 36-9 line 5).

12. As per claim 77, 78, Levin et al teach a method wherein the input modality includes selecting (by speaking) from a displayed option menu (see abstract, fig. 1-3, column 3 line 36-9 line 5).

13. As per claim 79, Levin et al teach a method performed with respect to a plurality of user and corresponding client devices (see abstract, fig. 1-3, column 3 line 36-9 line 5).

14. As per claim 80-81, Levin et al teach a method of selecting data source from plurality of electronic data source storing multimedia content including audio and video content (see abstract, fig. 1-3, column 3 line 36-9 line 5)

15. As per claim 82, Levin et al teach a system for speech-based navigation (*information server, 110*) of an electronic data source located at one or more network servers located remotely from a user, (*see abstract, fig 1, column 3 lines 5-35*), comprising a portable microphone (*microphone, 105*) receiving a spoken request (*receive a natural language query*) for desired information from the user (user) a language processing logic (*natural language server, 114*) rendering an interpretation (*creating a semantic representation*) of the spoken request, (see *abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22*) a query construction logic

(*service host, 112*) constructing a navigation (*generating search)* query based upon the interpretation; a query interaction logic (*service host, 112)* a query refining logic (*service host, 112)*) refining the navigation query, based upon the additional input (*see column 6 lines 20-59*), a navigation logic (*service host, 112)* using the navigation query to select a portion of the electronic data source; electronic infrastructure (*network, 108*) transmitting the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user. (*see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22)*. However, French-St. George et al. teach inventive concept of soliciting additional input from the user including user interaction in a non-spoken modality different that the original request (*see column 9 lines 36-65)*. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Levin et al's inventive concept to include French-St. George et al's inventive concept of soliciting additional input from the user including user interaction in a non-spoken modality different that the original request because this would have avoided or reduces error as the system search for user request thereby enhance the flexibility and the efficiency of the system.

16. As per claim 83, Levin et al teach a system of rendering the interpretation includes deriving linguistic information by using a speech recognition and a linguistic parser (see abstract, fig 1, column 3 lines 37-5 lines 40).

17. As per claim 84-86, Levin et al teach a system of constructing a navigation query in the form of a database query on a computing device located on a network including extracting an

input template for an online scripted interface to the data source to be used for the construction of the navigation query and dynamically scraping the online scripted interface (see abstract, fig. 1-3, column 3 line 36-9 line 5).

18. As per claim 87, 88, 100, Levin et al teach a system wherein at least a portion of the language processing if hosted on a computing device coupled with a microphone located locally with a user and a network computing device located remotely and data in a two-way communication infrastructure (coaxial, DSL, satellite, wireless/cellular, fiber-optic) (see abstract, fig. 1-3, column 3 line 36-9 line 5).

19. As per claim 89-94, Levin et al teach a system of soliciting additional input is performed in response deficiency including unresolved word encountered after the first navigation of the data source, required element of the navigational query, data recorded within the data source, failure to identify data record responsive to navigational query (see column 6 lines 20-59).

20. As per claim 95, 96, Levin et al teach a system wherein the input modality includes selecting (by speaking) from a displayed option menu (see abstract, fig. 1-3, column 3 line 36-9 line 5).

21. As per claim 97-98, Levin et al teach a system of selecting data source from plurality of electronic data source storing multimedia content including audio and video content (see abstract, fig. 1-3, column 3 line 36-9 line 5).

22. As per claim 99, Levin et al teach a system wherein the display device receives data from the electronic device on the network via a communication box (see abstract, fig. 1-3, column 3 line 36-9 line 5).

23. As per claim 101, Levin et al teach a computer program for speech-based navigation (*information server, 110)* of an electronic data source located at one or more network servers located remotely from a user, (*see abstract, fig 1, column 3 lines 5-35*), comprising code segment receiving a spoken request (*receive a natural language query*) for desired information from the user (user); code segment rendering an interpretation (*creating a semantic representation*) of the spoken request, code segment constructing a navigation (*generating search)* query based upon the interpretation code segment, refining the navigation query, based upon the additional input (*see column 6 lines 20-59*), code segment using the navigation query to select a portion of the electronic data source; and code segment transmitting the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user (*see abstract, fig. 1-3, column 3 line 36-9 line 5, see also claim 1, 10, 22*). However, French-St. George et al. teach inventive concept of soliciting additional input from the user including user interaction in a non-spoken modality different that the original request (*see column 9 lines 36-65).* Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Levin et al's inventive concept to include French-St. George et al's inventive concept of soliciting additional input from the user including user interaction in a non-spoken modality different that the original request because this would have avoided or

reduces error as the system search for user request thereby enhance the flexibility and the efficiency of the system.

24. As per claim 102, Levin et al teach a code segment deriving linguistic information by using a speech recognition and a linguistic parser (see abstract, fig 1, column 3 lines 37-5 lines 40).

25. As per claim 103-105, Levin et al teach a code segment of constructing a navigation query in the form of a database query on a computing device located on a network including extracting an input template for an online scripted interface to the data source to be used for the construction of the navigation query and dynamically scraping the online scripted interface (see abstract, fig. 1-3, column 3 line 36-9 line 5).

26. As per claim 106-107, Levin et al teach a computer program wherein rendering of the interpretation and the construction of the navigation query are performed on a computing device located locally with or remotely from the user (see abstract, fig. 1-3, column 3 line 36-9 line 5).

27. As per claim 108-114, Levin et al teach a code segment that solicits additional input display on option menu is performed by speaking in response deficiency including unresolved word encountered after the first navigation of the data source, required element of the navigational query, data recorded within the data source, failure to identify data record responsive to navigational query (see column 6 lines 20-59).

28. As per claim 115, Levin et al teach a computer program the act of selecting from the display is performed by speaking (see column 6 lines 20-59)

29. As per claim 116, Levin et al teach a code segment of the computer program operate with respect to a plurality of simultaneous user and corresponding client devices (see abstract, fig. 1-3, column 3 line 36-9 line 5).

30. As per claim 117, Levin et al teach a code segment that select data source form a plurality of electronic data source .... content (see abstract, fig. 1-3, column 3 line 36-9 line 5).

31. As per claim 118, Levin et al teach a computer program of selecting data source from plurality of electronic data source storing multimedia content including audio and video content (see abstract, fig. 1-3, column 3 line 36-9 line 5).

32. As per claim 119, Levin et al teach a computer program wherein the additional input is solicited upon receiving a user-input statement...(see column 6 lines 20-59).

33. As per claim 120-123, Levin et al teach a code segment of soliciting additional input from the user, including presenting: a menu, a textual or an audible request, a list of portions of data source (see abstract, fig. 1-3, column 3 line 36-9 line 5).

34. As per claim 124-125, Levin et al teach a computer program wherein additional input received from the user is speech based, of no spoken input source (see abstract, fig. 1-3, column 3 line 36-9 line 5).

35. As per claim 126, Levin et al teach a code segment wherein steps (d)-(e) are repeated until the navigational query if deemed adequate source (see abstract, fig. 1-3, column 3 line 36-9 line 5).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Firmin Backer whose telephone number is (703) 305-0624. The examiner can normally be reached on Mon-Thu 8:30-6:00. .

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Trammel can be reached on (703) 305-9768. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7239 for regular communications and (703) 746-7238 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-5484.

Firmin Backer
May 3, 2002

JAMES P. TRAMMELL
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

2155

PATENT

#29
LDS
7-1-02

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: JULIA, LUC

Serial No.: 09/524,095

Filed: 3/13/2000

GAU/Examiner: 2155/BACKER, F.

For: NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL CONVERGENT ERROR FEEDBACK

OIPE JC184
JUN 25 2002
PATENT & TRADEMARK OFFICE

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I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail to: Commissioner for Patents, Washington, D.C. 20231
on: 06/18/02

Signed: ______________________

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CHANGE OF ATTORNEY'S ADDRESS IN APPLICATION

Commissioner for Patents
Washington, D. C. 20231

Sir:

Please send all correspondence for this application as follows:

PERKINS COIE LLP
101 Jefferson Drive
Menlo Park, CA 94025-1114

Please direct any calls to Paul L. Hickman at (650) 838-4443.

Dated: 06/18/02

Respectfully submitted,

PERKINS COIE LLP

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101 Jefferson Drive
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Attorney Docket No. SRI1P037 USA

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SERIAL NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKETT NO.

EXAMINER

ART UNIT	PAPER NUMBER
	29

DATE MAILED:

EXAMINER INTERVIEW SUMMARY RECORD

All participants (applicant, applicant's representative, PTO personnel):

(1) David Wiley (3) ______

(2) Kuwah Tong 39,400 (4) ______

Date of interview ______

Type: ☐ Telephonic ☒ Personal (copy is given to ☐ applicant ☐ applicant's representative).

Exhibit shown or demonstration conducted: ☐ Yes ☒ No. If yes, brief description: ______

Agreement ☒ was reached with respect to some or all of the claims in question. ☐ was not reached.

Claims discussed: 56-126

Identification of prior art discussed: French

Description of the general nature of what was agreed to if an agreement was reached, or any other comments: The applicant agreed to ~~the~~ amend element (d) in claim 56, 82, 101 and ~~the~~ examiner agreed to withdraw the previous rejection upon the amendment.

(A fuller description, if necessary, and a copy of the amendments, if available, which the examiner agreed would render the claims allowable must be attached. Also, where no copy of the amendments which would render the claims allowable is available, a summary thereof must be attached.)

☒ 1. It is not necessary for applicant to provide a separate record of the substance of the interview.

Unless the paragraph below has been checked to indicate to the contrary, A FORMAL WRITTEN RESPONSE TO THE LAST OFFICE ACTION IS NOT WAIVED AND MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW (e.g., items 1-7 on the reverse side of this form). If a response to the last Office action has already been filed, then applicant is given one month from this interview date to provide a statement of the substance of the interview.

☐ 2. Since the examiner's interview summary above (including any attachments) reflects a complete response to each of the objections, rejections and requirements that may be present in the last Office action, and since the claims are now allowable, this completed form is considered to fulfill the response requirements of the last Office action. Applicant is not relieved from providing a separate record of the substance of the interview unless box 1 above is also checked.

Examiner's Signature

PTOL-413 (REV. 2-93)

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8/7/2 Resp/Amd 29

09/524,095

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Technology Center 2100

IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE

PATENT APPLICATION

Applicant: **Halverson et al.**

Case: **SRI1P037**

Serial No.: **09/524,095** Filed: **March 13, 2000**

Group Art Unit: **2155**

Examiner: **Firmin Backer**

Title: **NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK**

ASSISTANT COMMISSIONER FOR PATENTS
Box Non-Fee Amendment
Washington, D. C. 20231

09/13/2002 DFORTE 00000001 200782 09524095
01 FC:202 84.00 CH
02 FC:203 54.00 CH

SIR:

AMENDMENT AND RESPONSE UNDER 37 C.F.R. § 1.111

This response addresses the Office Action dated May 7, 2002. The Office Action appears to be labeled as Paper No. 10.

IN THE CLAIMS

Please amend claims 56-181 as shown below. The claims are "clean version" of the amended claims, i.e., with changes incorporated into the claims, whereas the Appendix to this Amendment illustrates the amended claims using underlines and brackets to indicate addition and deletion, respectively.

56. (Twice Amended) A method for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers

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09/524,095

located remotely from a user, comprising the steps of:

(a) receiving a spoken request for desired information from the user;

(b) rendering an interpretation of the spoken request;

(c) constructing at least part of a navigation query based upon the interpretation;

(d) soliciting additional input from the user, including user interaction in a non-spoken modality different than the original request without requiring the user to request said non-spoken modality;

(e) refining the navigation query, based upon the additional input;

(f) using the refined navigation query to select a portion of the electronic data source; and

(g) transmitting the selected portion of the electronic data source from the network server to a client device of the user.

2 ~~57~~. (Amended) The method of claim 1 ~~56~~, wherein the step of rendering an interpretation further includes deriving linguistic information by using a speech recognition engine and a linguistic parser.

3 ~~58~~. (Amended) The method of claim 1 ~~56~~, wherein the step of constructing a navigation query further includes the steps of extracting an input template for an online scripted interface to the data source, and using the input template to construct the navigation query.

4 ~~59~~. (Amended) The method of claim 3 ~~58~~, wherein the step of extracting the input template includes dynamically scraping the online scripted interface.

5 ~~60~~. (Amended) The method of claim 1 ~~56~~, wherein the navigation query is constructed in the format of a database query language.

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09/524,095

6
~~61~~. (Amended) The method of claim ~~56~~ 1, wherein the step of rendering an interpretation and the step of constructing a navigation query are performed, at least in part, on a computing device located locally with the user.

7
~~62~~. (Amended) The method of claim ~~56~~ 1, wherein the step of rendering an interpretation and the step of constructing a navigation query are performed, at least in part, on a network computing device located remotely from the user.

8
~~63~~. (Amended) The method of claim ~~56~~ 1, wherein the step of soliciting additional input is performed in response to one or more deficiencies encountered during the step of constructing a navigation query.

9
~~64~~. (Amended) The method of claim ~~63~~ 8, wherein the deficiencies include unresolved words of the spoken request.

10
~~65~~. (Amended) The method of claim ~~63~~ 8, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken request.

11
~~66~~. (Amended) The method of claim ~~56~~ 1, wherein the step of soliciting additional input is performed in response to one or more deficiencies encountered after a first navigation of the data source using the navigation query constructed in step (c).

12
~~67~~. (Amended) The method of claim ~~66~~ 11, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

13
~~68~~. (Amended) The method of claim ~~66~~ 11, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

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09/524,095

14 ~~69~~. (Amended) The method of claim 1 ~~56~~, wherein the additional input is solicited upon receiving a user-input statement that additional information is required.

15 ~~70~~. (Amended) The method of claim 1 ~~56~~, wherein the step of soliciting the additional input includes presenting a menu to the user on the client device of the user.

16 ~~71~~. (Amended) The method of claim 1 ~~56~~, wherein the step of soliciting the additional input includes presenting a textual request for the additional input.

17 ~~72~~. (Amended) The method of claim 1 ~~56~~, wherein the step of soliciting the additional input includes an audible request for the additional input.

18 ~~73~~. (Amended) The method of claim 1 ~~56~~, wherein the step of soliciting the additional input includes presenting a list of portions of the electronic data source that match the navigational query.

19 ~~74~~. (Amended) The method of claim 1 ~~56~~, wherein additional input received from the user is at least partially speech based.

20 ~~75~~. (Amended) The method of claim 1 ~~56~~, wherein additional input received from the user includes no spoken input.

21 ~~76~~. (Amended) The method of claim 1 ~~56~~, wherein steps (d)-(e) are repeated until the navigational query is deemed adequate.

22 ~~77~~. (Amended) The method of claim 1 ~~56~~, wherein the input modality of step (d) includes selecting from a displayed option menu.

23 ~~78~~. (Amended) The method of claim 22 ~~77~~, wherein the act of selecting from the displayed

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option menu is performed by speaking.

24 ~~79~~. (Amended) The method of claim ~~50~~ 1, wherein the method is performed with respect to a plurality of simultaneous users and corresponding client devices.

25 ~~80~~. (Amended) The method of claim ~~50~~ 1, further including the step of selecting the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken request.

26 ~~81~~. (Amended) The method of claim ~~56~~ 1, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

27 ~~82~~. (Twice amended) A system for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, the system comprising:

(a) a portable microphone operable to receive a spoken request for desired information from the user;

(b) language processing logic, operable to render an interpretation of the spoken request;

(c) query construction logic, operable to construct a navigation query in response to the interpretation of the spoken request;

(d) user interaction logic, operable to solicit additional input from the user, including user interaction in a non-spoken modality different than the original request without requiring the user to request said non-spoken modality;

(e) query refining logic, operable to refine the navigation query, based upon the additional input;

(f) navigation logic, operable to select a portion of the electronic data source using the navigation query; and

(g) electronic communications infrastructure for transmitting the selected portion

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of the electronic data source from the network server to a primarily stationary, display device located locally with the user.

28 ~~83~~. (Amended) The system of claim 27 ~~82~~, wherein the language processing logic includes speech recognition logic and an linguistic parsing logic for deriving linguistic information.

29 ~~84~~. (Amended) The system of claim 27 ~~82~~, wherein the language processing logic extracts an input template for an online scripted interface to the data source, and uses the input template to construct the navigation query.

30 ~~85~~. (Amended) The system of claim 29 ~~84~~, wherein the language processing logic dynamically scrapes the online scripted interface.

31 ~~86~~. (Amended) The system of claim 27 ~~82~~, wherein the query construction logic constructs the query in the format of a database query language.

32 ~~87~~. (Amended) The system of claim 27 ~~82~~, wherein at least a portion of the language processing logic is hosted on a computing device located locally with the user, and wherein the portable microphone is electronically coupled to the local computing device.

33 ~~88~~. (Amended) The system of claim 27 ~~82~~, wherein at least a portion of the language processing logic is hosted on a network computing device located remotely from the user, and wherein the portable microphone sends data to the remote network computing device via the communications infrastructure.

34 ~~89~~. (Amended) The system of claim 27 ~~82~~, wherein the user interaction logic solicits additional input in response to one or more deficiencies encountered during construction of the navigation query.

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~~90.~~ 35. (Amended) The system of claim ~~89~~ 34, wherein the deficiencies include unresolved words of the spoken request.

~~91.~~ 36. (Amended) The system of claim ~~89~~ 34, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken request.

~~92.~~ 37. (Amended) The system of claim ~~82~~ 27, wherein the user interaction logic solicits additional input in response to one or more deficiencies encountered after a first navigation of the data source performed by the navigation logic.

~~93.~~ 38. (Amended) The system of claim ~~92~~ 37, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

~~94.~~ 39. (Amended) The system of claim ~~92~~ 37, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

~~95.~~ 40. (Amended) The system of claim ~~82~~ 27, wherein the user interaction logic displays an option menu.

~~96.~~ 41. (Amended) The system of claim ~~95~~ 40, wherein the act of selecting from the displayed option menu is performed by speaking.

~~97.~~ 42. (Amended) The system of claim ~~82~~ 27, wherein the navigation logic selects the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken request.

~~98.~~ 43. (Amended) The system of claim ~~82~~ 27, wherein the electronic data source stores

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multimedia content including at least one of video content and audio content.

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~~99~~. (Amended) The system of claim ~~82~~ 27, wherein the display device receives data from the electronic data source on the network servers via a communications box.

45
~~100~~. (Amended) The system of claim ~~82~~ 27, wherein the electronic communication infrastructure is a two-way infrastructure and is selected from among one or more of the following group: {coaxial cable, DSL, satellite, wireless/cellular, fiber-optic}.

46
~~101~~. (Twice amended) A computer program embodied on a computer readable medium for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising:

(a) a code segment that receives a spoken request for desired information from the user;

(b) a code segment that renders an interpretation of the spoken request;

(c) a code segment that constructs at least part of a navigation query based upon the interpretation;

(d) a code segment that solicits additional input from the user, including user interaction in a non-spoken modality different than the original request without requiring the user to request said non-spoken modality;

(e) a code segment that refines the navigation query, based upon the additional input;

(f) a code segment that uses the refined navigation query to select a portion of the electronic data source; and

(g) a code segment that transmits the selected portions of the electronic data source from the network server to a primarily stationary, display device located locally with the user.

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~~102~~. (Amended) The computer program of claim ~~101~~ 46, further comprising a code

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segment that derives linguistic information by using a speech recognition engine and a linguistic parser.

48 ~~103~~. (Amended) The computer program of claim 46 ~~101~~, further comprising a code segment that extract an input template for an online scripted interface to the data source, and a code segment that uses the input template to construct the navigation query.

49 ~~104~~. (Amended) The computer program of claim 48 ~~103~~, further comprising a code segment that dynamically scrapes the online scripted interface.

50 ~~105~~. (Amended) The computer program of claim 46 ~~101~~, wherein the navigation query is constructed in the format of a database query language.

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51 ~~106~~. (Amended) The computer program of claim 46 ~~101~~, wherein rendering of the interpretation and the construction of the navigation query are performed, at least in part, on a computing device located locally with the user.

52 ~~107~~. (Amended) The compute program of claim 46 ~~101~~, wherein the rendering of the interpretation and the construction of a navigation query are performed, at least in part, on a network computing device located remotely from the user.

53 ~~108~~. (Amended) The computer program of claim 46 ~~101~~, wherein code segment that solicits additional input solicits the additional input in response to one or more deficiencies encountered during the constructing of the navigation query.

54 ~~109~~. (Amended) The computer program of claim 53 ~~108~~, wherein the deficiencies include unresolved words of the spoken request.

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55 ~~110~~. (Amended) The computer program of claim 53 ~~108~~, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken request.

56 ~~111~~. (Amended) The computer program of claim 46 ~~101~~, wherein the code segment that solicits the additional input solicits the additional input in response to one or more deficiencies encountered after a first navigation of the data source.

57 ~~112~~. (Amended) The computer program of claim 56 ~~111~~, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

58 ~~113~~. (Amended) The computer program of claim 57 ~~112~~, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

59 ~~114~~. (Amended) The computer program of claim 46 ~~101~~, wherein code segment that solicits additional input displays an option menu.

60 ~~115~~. (Amended) The computer program of claim 59 ~~114~~, wherein the act of selecting from the displayed option menu is performed by speaking.

61 ~~116~~. (Amended) The computer program of claim 46 ~~101~~, wherein the code segments of the computer program operate with respect to a plurality of simultaneous users and corresponding client devices.

62 ~~117~~. (Amended) The computer program of claim 46 ~~101~~, further comprising a code segment that selects the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken request.

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~~118~~ 63. (Amended) The computer program of claim ~~101~~ 46, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

~~119~~ 64. (Amended) The computer program of claim ~~101~~ 46, wherein the additional input is solicited upon receiving a user-input statement that additional information is required.

~~120~~ 65. (Amended) The computer program of claim ~~101~~ 46, wherein the code segment that solicits the additional input includes a code segment that presents a menu to the user on the client device of the user.

~~121~~ 66. (Amended) The computer program of claim ~~101~~ 46, wherein the code segment that solicits the additional input includes a code segment that presents a textual request for the additional input.

~~122~~ 67. (Amended) The computer program of claim ~~101~~ 46, wherein the code segment that solicits the additional input includes a code segment that produces an audible request for the additional input.

~~123~~ 68. (Amended) The computer program of claim ~~101~~ 46, wherein the code segment that solicits the additional input includes a code segment that presents a list of portions of the electronic data source that match the navigational query.

~~124~~ 69. (Amended) The computer program of claim ~~101~~ 46, wherein additional input received from the user is at least partially speech based.

~~125~~ 70. (Amended) The computer program of claim ~~101~~ 46, wherein additional input received from the user includes no spoken input.

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~~126~~. (Amended) The compute program of claim ~~101~~ 44, wherein code segments (d)-(e) are repeated until the navigational query is deemed adequate.

72
~~127~~. (Amended) A method for utilizing spoken natural language for navigating an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising the steps of:

(a) receiving a spoken natural language ("NL") request for desired information from the user;

(b) rendering an interpretation of the spoken request;

(c) constructing at least part of a navigation query based upon the interpretation;

(d) soliciting additional input from the user, including user interaction in a non-spoken modality different than the original request without requiring the user to request said non-spoken modality;

(e) refining the navigation query, based upon the additional input;

(f) using the refined navigation query to select a portion of the electronic data source; and

(g) transmitting the selected portion of the electronic data source from the network server to a client device of the user.

73
~~128~~. (Amended) The method of claim ~~127~~ 72, wherein the step of rendering an interpretation further includes deriving linguistic information by using a speech recognition engine and an NL parser.

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~~129~~. (Amended) The method of claim ~~127~~ 72, wherein the step of constructing a navigation query further includes the steps of extracting an input template for an online scripted interface to the data source, and using the input template to construct the navigation query.

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15 ~~130~~. (Amended) The method of claim 14 ~~129~~, wherein the step of extracting an input template includes dynamically scraping the online scripted interface.

16 ~~131~~. (Amended) The method of claim 12 ~~127~~, wherein the navigation query is constructed in the format of a database query language.

17 ~~132~~. (Amended) The method of claim 12 ~~127~~, wherein the step of rendering an interpretation and the step of constructing a navigation query are performed, at least in part, on a computing device located locally with the user.

18 ~~133~~. (Amended) The method of claim 12 ~~127~~, wherein the step of rendering an interpretation and the step of constructing a navigation query are performed, at least in part, on a network computing device located remotely from the user.

19 ~~134~~. (Amended) The method of claim 12 ~~127~~, wherein the step of soliciting additional input is performed in response to one or more deficiencies encountered during the step of constructing a navigation query.

20 ~~135~~. (Amended) The method of claim 19 ~~134~~, wherein the deficiencies include unresolved words of the spoken NL request.

21 ~~136~~. (Amended) The method of claim 19 ~~134~~, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken NL request.

22 ~~137~~. (Amended) The method of claim 12 ~~127~~, wherein the step of soliciting additional input is performed in response to one or more deficiencies encountered after a first navigation of the data source using the navigation query constructed in step (c).

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~~138~~ 83. (Amended) The method of claim ~~127~~ 82, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

~~139~~ 84. (Amended) The method of claim ~~127~~ 82, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

~~140~~ 85. (Amended) The method of claim ~~127~~ 72, wherein the input modality of step (d) includes selecting from a displayed option menu.

~~141~~ 86. (Amended) The method of claim ~~140~~ 85, wherein the act of selecting from the displayed option menu is performed by speaking.

~~142~~ 87. (Amended) The method of claim ~~127~~ 72, wherein the method is performed with respect to a plurality of simultaneous users and corresponding client devices.

~~143~~ 88. (Amended) The method of claim ~~127~~ 72, further including the step of selecting the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken NL request.

~~144~~ 89. (Amended) The method of claim ~~127~~ 72, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

~~145~~ 90. (Amended) A system for utilizing spoken natural language to navigate an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, the system comprising:

(a) a portable microphone operable to receive a spoken natural language ("NL") request for desired information from the user;

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(b) spoken language processing logic, operable to render an interpretation of the spoken natural language request;

(c) query construction logic, operable to construct a navigation query in response to the interpretation of the spoken natural language request;

(d) user interaction logic, operable to solicit additional input from the user, including user interaction in a non-spoken modality different than the original request without requiring the user to request said non-spoken modality;

(e) query refining logic, operable to refine the navigation query, based upon the additional input;

(f) navigation logic, operable to select a portion of the electronic data source using the navigation query; and

(g) electronic communications infrastructure for transmitting the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user.

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91 ~~146~~. (Amended) The system of claim 90 ~~145~~, wherein the spoken language processing logic includes speech recognition logic and an NL parsing logic for deriving linguistic information.

92 ~~147~~. (Amended) The system of claim 90 ~~145~~, wherein the spoken language processing logic extracts an input template for an online scripted interface to the data source, and uses the input template to construct the navigation query.

93 ~~148~~. (Amended) The system of claim 90 ~~145~~, wherein the spoken language processing logic dynamically scrapes the online scripted interface.

94 ~~149~~. (Amended) The system of claim 90 ~~148~~, wherein the query construction logic constructs the query in the format of a database query language.

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95 ~~150~~. (Amended) The system of claim 90 ~~145~~, wherein at least a portion of the spoken language processing logic is hosted on a computing device located locally with the user, and wherein the portable microphone is electronically coupled to the local computing device.

96 ~~151~~. (Amended) The system of claim 90 ~~145~~, wherein at least a portion of the spoken language processing logic is hosted on a network computing device located remotely from the user, and wherein the portable microphone sends data to the remote network computing device via the communications infrastructure.

97 ~~152~~. (Amended) The system of claim 90 ~~145~~, wherein the user interaction logic solicits additional input in response to one or more deficiencies encountered during construction of the navigation query.

98 ~~153~~. (Amended) The system of claim 97 ~~152~~, wherein the deficiencies include unresolved words of the spoken NL request.

99 ~~154~~. (Amended) The system of claim 97 ~~152~~, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken NL request.

100 ~~155~~. (Amended) The system of claim 90 ~~145~~, wherein the user interaction logic solicits additional input in response to one or more deficiencies encountered after a first navigation of the data source performed by the navigation logic.

101 ~~156~~. (Amended) The system of claim 100 ~~155~~, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

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~~157~~ 102. (Amended) The system of claim ~~155~~ 100, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

~~158~~ 103. (Amended) The system of claim ~~155~~ 100, wherein the user interaction logic displays an option menu.

~~159~~ 104. (Amended) The system of claim ~~158~~ 103, wherein the act of selecting from the displayed option menu is performed by speaking.

~~160~~ 105. (Amended) The system of claim ~~145~~ 90, wherein the navigation logic selects the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken NL request.

~~161~~ 106. (Amended) The system of claim ~~145~~ 90, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

~~162~~ 107. (Amended) The system of claim ~~145~~ 90, wherein the display device receives data from the electronic data source on the network servers via a communications box.

~~163~~ 108. (Amended) The system of claim ~~145~~ 90, wherein the electronic communication infrastructure is a two-way infrastructure and is selected from among one or more of the following group: {coaxial cable, DSL, satellite, wireless/cellular, fiber-optic}.

~~164~~ 109. (Amended) A computer program embodied on a computer readable medium for utilizing spoken natural language for navigating an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising:

(a) a code segment that receives a spoken natural language ("NL") request for desired information from the user;

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(b) a code segment that renders an interpretation of the spoken natural language request;

(c) a code segment that constructs at least part of a navigation query based upon the interpretation;

(d) a code segment that solicits additional input from the user, including user interaction in a non-spoken modality different than the original request without requiring the user to request said non-spoken modality;

(e) a code segment that refines the navigation query, based upon the additional inputs;

(f) a code segment that uses the refined navigation query to select a portion of the electronic data source; and

(g) a code segment that transmits the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user.

110 ~~165~~. (Amended) The computer program of claim 109 ~~164~~, further comprising a code segment that derives linguistic information by using a speech recognition engine and an NL parser.

111 ~~166~~. (Amended) The computer program of claim 109 ~~164~~, further comprising a code segment that extract an input template for an online scripted interface to the data source, and a code segment that uses the input template to construct the navigation query.

112 ~~167~~. (Amended) The computer program of claim 111 ~~166~~, further comprising a code segment that dynamically scrapes the online scripted interface.

113 ~~168~~. (Amended) The computer program of claim 109 ~~164~~, wherein the navigation query is constructed in the format of a database query language.

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114 ~~169~~. (Amended) The computer program of claim 109 ~~164~~, wherein rendering of the interpretation and the construction of the navigation query are performed, at least in part, on a computing device located locally with the user.

115 ~~170~~. (Amended) The computer program of claim 109 ~~164~~, wherein the rendering of the interpretation and the construction of a navigation query are performed, at least in part, on a network computing device located remotely from the user.

116 ~~171~~. (Amended) The computer program of claim 109 ~~164~~, wherein code segment that solicits additional input solicits the additional input in response to one or more deficiencies encountered during the constructing of the navigation query.

117 ~~172~~. (Amended) The computer program of claim 116 ~~171~~, wherein the deficiencies include unresolved words of the spoken NL request.

118 ~~173~~. (Amended) The computer program of claim 116 ~~171~~, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken NL request.

119 ~~174~~. (Amended) The computer program of claim 109 ~~164~~, wherein the code segment that solicits the additional input solicits the additional input in response to one or more deficiencies encountered after a first navigation of the data source.

120 ~~175~~. (Amended) The computer program of claim 119 ~~174~~, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

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~~176~~. (Amended) The computer program of claim ~~174~~, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

122 109

~~177~~. (Amended) The computer program of claim ~~164~~, wherein code segment that solicits additional input displays an option menu.

123 122

~~178~~. (Amended) The computer program of claim ~~177~~, wherein the act of selecting from the displayed option menu is performed by speaking.

124 109

~~179~~. (Amended) The computer program of claim ~~164~~, wherein the code segments of the computer program operate with respect to a plurality of simultaneous users and corresponding client devices.

125 109

~~180~~. (Amended) The computer program of claim ~~164~~, further comprising a code segment that selects the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken NL request.

126 109

~~181~~. (Amended) The computer program of claim ~~164~~, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

Please add the following new claims:

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~~182~~. (New) A method for utilizing spoken natural language for navigating an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising the steps of:

(a) receiving a spoken natural language ("NL") request for desired information from the user;

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(b) rendering an interpretation of the spoken request;

(c) constructing at least part of a navigation query based upon the interpretation;

(d) soliciting additional input from the user, including user interaction in a non-spoken modality different than the original request, in accordance with results generated from said at least part of a navigation query;

(e) refining the navigation query, based upon the additional input;

(f) using the refined navigation query to select a portion of the electronic data source; and

(g) transmitting the selected portion of the electronic data source from the network server to a client device of the user.

128 ~~183~~. (New) The method of claim 127 ~~182~~, wherein the input modality of step (d) includes selecting from a displayed option menu.

129 ~~184~~. (New) The method of claim 128 ~~183~~, wherein the act of selecting from the displayed option menu is performed by speaking.

130 ~~185~~. (New) A method for utilizing spoken natural language for navigating an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising the steps of:

(a) receiving a spoken natural language ("NL") request for desired information from the user;

(b) rendering an interpretation of the spoken request;

(c) constructing at least part of a navigation query based upon the interpretation;

(d) soliciting additional input from the user, including user interaction in a non-spoken modality different than the original request, in response to one or more deficiencies encountered during the step of constructing said at least part of a navigation query;

(e) refining the navigation query, based upon the additional input;

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(f) using the refined navigation query to select a portion of the electronic data source; and

(g) transmitting the selected portion of the electronic data source from the network server to a client device of the user.

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131 ~~186~~. (New) The method of claim 130 ~~185~~, wherein the input modality of step (d) includes selecting from a displayed option menu.

132 ~~187~~. (New) The method of claim 131 ~~186~~, wherein the act of selecting from the displayed option menu is performed by speaking.

REMARKS

Applicants' representative would like to thank Primary Examiner David Wiley for kindly taking a substantial amount of time on May 23, 2002 to discuss the merits of the subject invention in a face-to-face Examiner Interview. Applicants' representative is aware of the time constraint that is placed on the Examiner and is appreciative of the Examiner's willingness to devote such large quantity of time to discuss the case on the merit.

In view of the following discussion, the Applicants submit that none of the claims now pending in the application are anticipated under the provisions of 35 U.S.C. § 103. Thus, the Applicants believe that all of these claims are now in allowable form.

I. MISNUMBERING OF CLAIMS

The Examiner has correctly detected that the claims (1-71) added in the Preliminary Amendment dated June 30, 2000 to replace the originally filed claims 1-55 were incorrectly numbered. The Examiner, in turn, renumbered these claims as 56-126 in the Office Action dated April 24, 2001.

However, Applicants also filed a second Preliminary Amendment "B" on September 12, 2000 that re-inserted the original claims 1-55. Again, Applicants

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misnumbered these claims as 72-126. Applicants now believe that these claims should be renumbered as claims 127-181. In fact, Applicants previously requested Examiner Backer to acknowledge these claims in Applicants' Preliminary Amendment dated April 10, 2002 that was filed in conjunction with a RCE. However, the Examiner is completely silent as to the status of these claims in the present Office Action.

This issue was brought to the attention of Primary Examiner David Wiley during the Examiner Interview. The Examiner acknowledged the existence of these claims and indicated that the agreement reached during the Examiner Interview is equally applicable to these claims.

To assist the Examiner and as agreed during the Examiner Interview, Applicants have affirmatively amended claims 56-181 as shown above to reflect the proper numbering. Thus, renumbering these claims are purely cosmetic and do not narrow the scope of the claims. Applicants believe that claims 127-181 are also currently pending in the present application.

Applicants sincerely apologize for the confusion created by the misnumbering, but Applicants respectfully request that the Examiner verify the status of claims 127-181 in the next Office Action or Notice of Allowance. Namely, these claims have not been rejected or allowed.

II. REJECTION OF CLAIMS 56-126 UNDER 35 U.S.C. § 103

The Examiner has rejected claims 56-126 in Paragraphs 2-35 of the Office Action as being unpatentable over the Levin et al. patent (US Patent 6,173,279 issued January 9, 2001, hereinafter referred to as Levin) in view of French-St. George et al. (US Patent 6,012,030, issued January 4, 2000, hereinafter referred to as French). The rejection is respectfully traversed.

Levin teaches "a method of using at least one natural language query to retrieve information from one or more data resources and further performing a requested action using the retrieved information is disclosed". (See Levin, Column 2, lines 15-18) Namely, Levin teaches a method for using natural language query to obtain information, where upon receipt of the requested information, a desired action is executed based upon the requested information. To illustrate, Levin provides the example, where a user employs natural language to request the telephone number of a restaurant. Upon receipt of the telephone number, the telephone number is actually dialed for the user. (See Levin, Column 3 line 62 to Column 4, line 1)

French teaches a management of speech and audio prompts and interface, in multimodal user interfaces. Specifically, the system is designed to detect and dynamically switches the speech interface into background mode or foreground mode in response to the user's current interaction modality. In the background mode, the speech interface can only respond to a very limited set of voice commands. (See French, Column 3, lines 20-57)

During the Examiner Interview, Applicants directed the Examiner's attention to the fact that French is a layer by layer system, i.e., a system that repeatedly asks questions and waits for a response before issuing the next response, whereas Levin is a natural language query system. Thus, the combination of the alleged references was challenged by the Applicants.

Second, assuming, *arguendo*, that the alleged combination was proper, the combination still falls short of making Applicants' invention obvious. Namely, Applicants' invention solicits additional input from the user, including user interaction in a non-spoken modality different than the original request without requiring the user to request the non-spoken modality. In contrast, Levin is completely devoid of any disclosure pertaining to a different modality of interaction and French's invention is tied to the constant need to detect what the user is doing and shifting the speech interface back and forth between background and foreground modes. The Examiner agreed during the Examiner Interview that the alleged combination would not make Applicants' invention obvious.

However, the Examiner suggested that a clarification of step d) in the independent claims would be appropriate. Although Applicants believe that the current language would overcome the present obviousness rejection, Applicants nevertheless agreed to clarify step d) in the independent claims. Specifically, Applicants amended all the independent claims to recite the term "without requiring the user to request said non-spoken modality".

However, for the record, Applicants' position is that this term is provided purely to clarify the claim. The Examiner indicated that such clarification would be acceptable.

Therefore, the Applicants respectfully submit that independent claims 56, 82, 101, 127, 145, and 164 are not made obvious by the Levin and French references. As such, claims 56, 82, 101, 127, 145, and 164 fully satisfy the requirements of 35 U.S.C. §103 and are patentable thereunder.

Claims 57-81, 83-100, 102-126, 128-144, 146-163 and 165-181 depend, either directly or indirectly, from claims 56, 82, 101, 127, 145, and 164 and recite additional features therefor. Since Levin and French fail to make obvious Applicants' invention as recited in Applicants' independent claims 56, 82, 101, 127, 145, and 164, dependent claims 57-81, 83-100, 102-126, 128-144, 146-163 and 165-181 are also not made obvious under 35 U.S.C. § 103 and are allowable for the same reason noted above.

III. NEW CLAIMS 182-187

In addressing the Examiner's concern pertaining to the clarification of step d) in Applicants' independent claims, Applicants have added new independent claims 182 and 185 to address this issue in a different manner. Specifically, Applicants' new independent claims recite the term "in accordance with results generated from said at least part of a navigation query" and "in response to one or more deficiencies encountered during the step of constructing said at least part of a navigation query", respectively. Support for these claims can be found in Applicants' specification, page 17, line 7 to page 19, line 9. However, support for these claims may also exist in other sections of Applicants' application.

In brief, Applicants' invention allows the system to present a non-spoken modality of interaction to the user based upon the results generated by performing the partial navigation query. For example, the system evaluates the results (e.g., a short

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list of choices) generated by the partial navigation query, and may realize that additional user input is necessary. At this point, the system elects to interact with the user in a non-spoken modality, e.g., presenting the short list of choices on a display according to results generated.

Alternatively, the system may evaluate the navigation query itself, (i.e., without performing the navigation query) and may realize that additional user input is necessary to fully construct the navigation query. Based on the deficiencies encountered, the system will elect to interact with the user in a non-spoken modality. These approaches will allow the user to quickly refine the navigation query, thereby providing a sense of progress to the user.

For the reasons presented above, Applicants submit that independent claims 182 and 185 and dependent claims 183-184 and 186-187 are also patentable over the cited references. Since claims 182-187 are supported by Applicants' specification, no new matter is introduced.

Conclusion

Thus, the Applicants submit that all of these claims now fully satisfy the requirements of 35 U.S.C. §103. Consequently, the Applicants believe that all these claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues requiring the issuance of a final office action in any of the claims now pending in the application, it is requested that the Examiner telephone Mr. Kin-Wah Tong, Esq. at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

8/5/02

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Appendix

(Marked-up version of amended claims)

[1] 56. (Twice Amended) A method for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising the steps of:

(a) receiving a spoken request for desired information from the user;

(b) rendering an interpretation of the spoken request;

(c) constructing at least part of a navigation query based upon the interpretation;

(d) soliciting additional input from the user, including user interaction in a non-spoken modality different than the original request without requiring the user to request said non-spoken modality;

(e) refining the navigation query, based upon the additional input;

(f) using the refined navigation query to select a portion of the electronic data source; and

(g) transmitting the selected portion of the electronic data source from the network server to a client device of the user.

[2] 57. (Amended) The method of claim [1] 56, wherein the step of rendering an interpretation further includes deriving linguistic information by using a speech recognition engine and a linguistic parser.

[3] 58. (Amended) The method of claim [1] 56, wherein the step of constructing a navigation query further includes the steps of extracting an input template for an online scripted interface to the data source, and using the input template to construct the navigation query.

[4] 59. (Amended) The method of claim [3] 58, wherein the step of extracting the input template includes dynamically scraping the online scripted interface.

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[5] 60. (Amended) The method of claim [1] 56, wherein the navigation query is constructed in the format of a database query language.

[6] 61. (Amended) The method of claim [1] 56, wherein the step of rendering an interpretation and the step of constructing a navigation query are performed, at least in part, on a computing device located locally with the user.

[7] 62. (Amended) The method of claim [1] 56, wherein the step of rendering an interpretation and the step of constructing a navigation query are performed, at least in part, on a network computing device located remotely from the user.

[8] 63. (Amended) The method of claim [1] 56, wherein the step of soliciting additional input is performed in response to one or more deficiencies encountered during the step of constructing a navigation query.

[9] 64. (Amended) The method of claim [8] 63, wherein the deficiencies include unresolved words of the spoken request.

[10] 65. (Amended) The method of claim [8] 63, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken request.

[11] 66. (Amended) The method of claim [1] 56, wherein the step of soliciting additional input is performed in response to one or more deficiencies encountered after a first navigation of the data source using the navigation query constructed in step (c).

[12] 67. (Amended) The method of claim [11] 66, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

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[13] 68. (Amended) The method of claim [11] 66, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

[14] 69. (Amended) The method of claim [1] 56, wherein the additional input is solicited upon receiving a user-input statement that additional information is required.

[15] 70. (Amended) The method of claim [1] 56, wherein the step of soliciting the additional input includes presenting a menu to the user on the client device of the user.

[16] 71. (Amended) The method of claim [1] 56, wherein the step of soliciting the additional input includes presenting a textual request for the additional input.

[17] 72. (Amended) The method of claim [1] 56, wherein the step of soliciting the additional input includes an audible request for the additional input.

[18] 73. (Amended) The method of claim [1] 56, wherein the step of soliciting the additional input includes presenting a list of portions of the electronic data source that match the navigational query.

[19] 74. (Amended) The method of claim [1] 56, wherein additional input received from the user is at least partially speech based.

[20] 75. (Amended) The method of claim [1] 56, wherein additional input received from the user includes no spoken input.

[21] 76. (Amended) The method of claim [1] 56, wherein steps (d)-(e) are repeated until the navigational query is deemed adequate.

[22] 77. (Amended) The method of claim [1] 56, wherein the input modality of step (d) includes selecting from a displayed option menu.

[23] 78. (Amended) The method of claim [22] 77, wherein the act of selecting from the displayed option menu is performed by speaking.

[24] 79. (Amended) The method of claim [1] 56, wherein the method is performed with respect to a plurality of simultaneous users and corresponding client devices.

[25] 80. (Amended) The method of claim [1] 56, further including the step of selecting the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken request.

[26] 81. (Amended) The method of claim [1] 56, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

[27] 82. (Twice amended) A system for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, the system comprising:

(a) a portable microphone operable to receive a spoken request for desired information from the user;

(b) language processing logic, operable to render an interpretation of the spoken request;

(c) query construction logic, operable to construct a navigation query in response to the interpretation of the spoken request;

(d) user interaction logic, operable to solicit additional input from the user, including user interaction in a non-spoken modality different than the original request without requiring the user to request said non-spoken modality;

(e) query refining logic, operable to refine the navigation query, based upon the additional input;

(f) navigation logic, operable to select a portion of the electronic data source using the navigation query; and

(g) electronic communications infrastructure for transmitting the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user.

[28] 83. (Amended) The system of claim [27] 82, wherein the language processing logic includes speech recognition logic and an linguistic parsing logic for deriving linguistic information.

[29] 84. (Amended) The system of claim [27] 82, wherein the language processing logic extracts an input template for an online scripted interface to the data source, and uses the input template to construct the navigation query.

[30] 85. (Amended) The system of claim [29] 84, wherein the language processing logic dynamically scrapes the online scripted interface.

[31] 86. (Amended) The system of claim [27] 82, wherein the query construction logic constructs the query in the format of a database query language.

[32] 87. (Amended) The system of claim [27] 82, wherein at least a portion of the language processing logic is hosted on a computing device located locally with the user, and wherein the portable microphone is electronically coupled to the local computing device.

[33] 88. (Amended) The system of claim [27] 82, wherein at least a portion of the language processing logic is hosted on a network computing device located remotely

from the user, and wherein the portable microphone sends data to the remote network computing device via the communications infrastructure.

[34] <u>89</u>. (Amended) The system of claim [27] <u>82</u>, wherein the user interaction logic solicits additional input in response to one or more deficiencies encountered during construction of the navigation query.

[35] <u>90</u>. (Amended) The system of claim [34] <u>89</u>, wherein the deficiencies include unresolved words of the spoken request.

[36] <u>91</u>. (Amended) The system of claim [34] <u>89</u>, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken request.

[37] <u>92</u>. (Amended) The system of claim [27] <u>82</u>, wherein the user interaction logic solicits additional input in response to one or more deficiencies encountered after a first navigation of the data source performed by the navigation logic.

[38] <u>93</u>. (Amended) The system of claim [37] <u>92</u>, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

[39] <u>94</u>. (Amended) The system of claim [37] <u>92</u>, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

[40] <u>95</u>. (Amended) The system of claim [27] <u>82</u>, wherein the user interaction logic displays an option menu.

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[41] 96. (Amended) The system of claim [40] 95, wherein the act of selecting from the displayed option menu is performed by speaking.

[42] 97. (Amended) The system of claim [27] 82, wherein the navigation logic selects the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken request.

[43] 98. (Amended) The system of claim [27] 82, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

[44] 99. (Amended) The system of claim [27] 82, wherein the display device receives data from the electronic data source on the network servers via a communications box.

[45] 100. (Amended) The system of claim [27] 82, wherein the electronic communication infrastructure is a two-way infrastructure and is selected from among one or more of the following group: {coaxial cable, DSL, satellite, wireless/cellular, fiber-optic}.

[46] 101. (Twice amended) A computer program embodied on a computer readable medium for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising:

(a) a code segment that receives a spoken request for desired information from the user;

(b) a code segment that renders an interpretation of the spoken request;

(c) a code segment that constructs at least part of a navigation query based upon the interpretation;

(d) a code segment that solicits additional input from the user, including user interaction in a non-spoken modality different than the original request without requiring the user to request said non-spoken modality;

(e) a code segment that refines the navigation query, based upon the additional input;

(f) a code segment that uses the refined navigation query to select a portion of the electronic data source; and

(g) a code segment that transmits the selected portions of the electronic data source from the network server to a primarily stationary, display device located locally with the user.

[47] 102. (Amended) The computer program of claim [46] 101, further comprising a code segment that derives linguistic information by using a speech recognition engine and a linguistic parser.

[48] 103. (Amended) The computer program of claim [46] 101, further comprising a code segment that extract an input template for an online scripted interface to the data source, and a code segment that uses the input template to construct the navigation query.

[49] 104. (Amended) The computer program of claim [48] 103, further comprising a code segment that dynamically scrapes the online scripted interface.

[50] 105. (Amended) The computer program of claim [46] 101, wherein the navigation query is constructed in the format of a database query language.

[51] 106. (Amended) The computer program of claim [46] 101, wherein rendering of the interpretation and the construction of the navigation query are performed, at least in part, on a computing device located locally with the user.

[52] 107. (Amended) The compute program of claim [46] 101, wherein the rendering of

the interpretation and the construction of a navigation query are performed, at least in part, on a network computing device located remotely from the user.

[53] 108. (Amended) The computer program of claim [46] 101, wherein code segment that solicits additional input solicits the additional input in response to one or more deficiencies encountered during the constructing of the navigation query.

[54] 109. (Amended) The computer program of claim [53] 108, wherein the deficiencies include unresolved words of the spoken request.

[55] 110. (Amended) The computer program of claim [53] 108, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken request.

[56] 111. (Amended) The computer program of claim [46] 101, wherein the code segment that solicits the additional input solicits the additional input in response to one or more deficiencies encountered after a first navigation of the data source.

[57] 112. (Amended) The computer program of claim [56] 111, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

[58] 113. (Amended) The computer program of claim [57] 112, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

[59] 114. (Amended) The computer program of claim [46] 101, wherein code segment that solicits additional input displays an option menu.

[60] <u>115</u>. (Amended) The computer program of claim [59] <u>114</u>, wherein the act of selecting from the displayed option menu is performed by speaking.

[61] <u>116</u>. (Amended) The computer program of claim [46] <u>101</u>, wherein the code segments of the computer program operate with respect to a plurality of simultaneous users and corresponding client devices.

[62] <u>117</u>. (Amended) The computer program of claim [46] <u>101</u>, further comprising a code segment that selects the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken request.

[63] <u>118</u>. (Amended) The computer program of claim [46] <u>101</u>, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

[64] <u>119</u>. (Amended) The computer program of claim [46] <u>101</u>, wherein the additional input is solicited upon receiving a user-input statement that additional information is required.

[65] <u>120</u>. (Amended) The computer program of claim [46] <u>101</u>, wherein the code segment that solicits the additional input includes a code segment that presents a menu to the user on the client device of the user.

[66] <u>121</u>. (Amended) The computer program of claim [46] <u>101</u>, wherein the code segment that solicits the additional input includes a code segment that presents a textual request for the additional input.

[67] <u>122</u>. (Amended) The computer program of claim [46] <u>101</u>, wherein the code segment that solicits the additional input includes a code segment that produces an

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audible request for the additional input.

[68] 123. (Amended) The computer program of claim [46] 101, wherein the code segment that solicits the additional input includes a code segment that presents a list of portions of the electronic data source that match the navigational query.

[69] 124. (Amended) The computer program of claim [46] 101, wherein additional input received from the user is at least partially speech based.

[70] 125. (Amended) The computer program of claim [46] 101, wherein additional input received from the user includes no spoken input.

[71] 126. (Amended) The compute program of claim [46] 101, wherein code segments (d)-(e) are repeated until the navigational query is deemed adequate.

[72] 127. (Amended) A method for utilizing spoken natural language for navigating an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising the steps of:

- (a) receiving a spoken natural language ("NL") request for desired information from the user;
- (b) rendering an interpretation of the spoken request;
- (c) constructing at least part of a navigation query based upon the interpretation;
- (d) soliciting additional input from the user, including user interaction in a non-spoken modality different than the original request without requiring the user to request said non-spoken modality;
- (e) refining the navigation query, based upon the additional input;
- (f) using the refined navigation query to select a portion of the electronic data source; and

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(g) transmitting the selected portion of the electronic data source from the network server to a client device of the user.

[73] 128. (Amended) The method of claim [72] 127, wherein the step of rendering an interpretation further includes deriving linguistic information by using a speech recognition engine and an NL parser.

[74] 129. (Amended) The method of claim [72] 127, wherein the step of constructing a navigation query further includes the steps of extracting an input template for an online scripted interface to the data source, and using the input template to construct the navigation query.

[75] 130. (Amended) The method of claim [74] 129, wherein the step of extracting an input template includes dynamically scraping the online scripted interface.

[76] 131. (Amended) The method of claim [72] 127, wherein the navigation query is constructed in the format of a database query language.

[77] 132. (Amended) The method of claim [72] 127, wherein the step of rendering an interpretation and the step of constructing a navigation query are performed, at least in part, on a computing device located locally with the user.

[78] 133. (Amended) The method of claim [72] 127, wherein the step of rendering an interpretation and the step of constructing a navigation query are performed, at least in part, on a network computing device located remotely from the user.

[79] 134. (Amended) The method of claim [72] 127, wherein the step of soliciting additional input is performed in response to one or more deficiencies encountered during the step of constructing a navigation query.

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[80] 135. (Amended) The method of claim [79] 134, wherein the deficiencies include unresolved words of the spoken NL request.

[81] 136. (Amended) The method of claim [79] 134, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken NL request.

[82] 137. (Amended) The method of claim [72] 127, wherein the step of soliciting additional input is performed in response to one or more deficiencies encountered after a first navigation of the data source using the navigation query constructed in step (c).

[83] 138. (Amended) The method of claim [82] 137, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

[84] 139. (Amended) The method of claim [82] 137, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

[85] 140. (Amended) The method of claim [72] 127, wherein the input modality of step (d) includes selecting from a displayed option menu.

[86] 141. (Amended) The method of claim [85] 140, wherein the act of selecting from the displayed option menu is performed by speaking.

[87] 142. (Amended) The method of claim [72] 127, wherein the method is performed with respect to a plurality of simultaneous users and corresponding client devices.

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[88] 143. (Amended) The method of claim [72] 127, further including the step of selecting the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken NL request.

[89] 144. (Amended) The method of claim [72] 127, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

[90] 145. (Amended) A system for utilizing spoken natural language to navigate an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, the system comprising:

(a) a portable microphone operable to receive a spoken natural language ("NL") request for desired information from the user;

(b) spoken language processing logic, operable to render an interpretation of the spoken natural language request;

(c) query construction logic, operable to construct a navigation query in response to the interpretation of the spoken natural language request;

(d) user interaction logic, operable to solicit additional input from the user, including user interaction in a non-spoken modality different than the original request without requiring the user to request said non-spoken modality;

(e) query refining logic, operable to refine the navigation query, based upon the additional input;

(f) navigation logic, operable to select a portion of the electronic data source using the navigation query; and

(g) electronic communications infrastructure for transmitting the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user.

[91] 146. (Amended) The system of claim [90] 145, wherein the spoken language processing logic includes speech recognition logic and an NL parsing logic for deriving linguistic information.

[92] 147. (Amended) The system of claim [90] 145, wherein the spoken language processing logic extracts an input template for an online scripted interface to the data source, and uses the input template to construct the navigation query.

[93] 148. (Amended) The system of claim [90] 145, wherein the spoken language processing logic dynamically scrapes the online scripted interface.

[94] 149. (Amended) The system of claim [90] 145, wherein the query construction logic constructs the query in the format of a database query language.

[95] 150. (Amended) The system of claim [90] 145, wherein at least a portion of the spoken language processing logic is hosted on a computing device located locally with the user, and wherein the portable microphone is electronically coupled to the local computing device.

[96] 151. (Amended) The system of claim [90] 145, wherein at least a portion of the spoken language processing logic is hosted on a network computing device located remotely from the user, and wherein the portable microphone sends data to the remote network computing device via the communications infrastructure.

[97] 152. (Amended) The system of claim [90] 145, wherein the user interaction logic solicits additional input in response to one or more deficiencies encountered during construction of the navigation query.

[98] 153. (Amended) The system of claim [97] 152, wherein the deficiencies include unresolved words of the spoken NL request.

[99] 154. (Amended) The system of claim [97] 152, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken NL request.

[100] 155. (Amended) The system of claim [90] 145, wherein the user interaction logic solicits additional input in response to one or more deficiencies encountered after a first navigation of the data source performed by the navigation logic.

[101] 156. (Amended) The system of claim [100] 155, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

[102] 157. (Amended) The system of claim [100] 155, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

[103] 158. (Amended) The system of claim [100] 155, wherein the user interaction logic displays an option menu.

[104] 159. (Amended) The system of claim [103] 158, wherein the act of selecting from the displayed option menu is performed by speaking.

[105] 160. (Amended) The system of claim [90] 145, wherein the navigation logic selects the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken NL request.

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[106] 161. (Amended) The system of claim [90] 145, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

[107] 162. (Amended) The system of claim [90] 145, wherein the display device receives data from the electronic data source on the network servers via a communications box.

[108] 163. (Amended) The system of claim [90] 145, wherein the electronic communication infrastructure is a two-way infrastructure and is selected from among one or more of the following group: {coaxial cable, DSL, satellite, wireless/cellular, fiber-optic}.

[109] 164. (Amended) A computer program embodied on a computer readable medium for utilizing spoken natural language for navigating an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising:

(a) a code segment that receives a spoken natural language ("NL") request for desired information from the user;

(b) a code segment that renders an interpretation of the spoken natural language request;

(c) a code segment that constructs at least part of a navigation query based upon the interpretation;

(d) a code segment that solicits additional input from the user, including user interaction in a non-spoken modality different than the original request without requiring the user to request said non-spoken modality;

(e) a code segment that refines the navigation query, based upon the additional inputs;

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(f) a code segment that uses the refined navigation query to select a portion of the electronic data source; and

(g) a code segment that transmits the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user.

[110] 165. (Amended) The computer program of claim [109] 164, further comprising a code segment that derives linguistic information by using a speech recognition engine and an NL parser.

[111] 166. (Amended) The computer program of claim [109] 164, further comprising a code segment that extract an input template for an online scripted interface to the data source, and a code segment that uses the input template to construct the navigation query.

[112] 167. (Amended) The computer program of claim [111] 166, further comprising a code segment that dynamically scrapes the online scripted interface.

[113] 168. (Amended) The computer program of claim [109] 164, wherein the navigation query is constructed in the format of a database query language.

[114] 169. (Amended) The computer program of claim [109] 164, wherein rendering of the interpretation and the construction of the navigation query are performed, at least in part, on a computing device located locally with the user.

[115] 170. (Amended) The computer program of claim [109] 164, wherein the rendering of the interpretation and the construction of a navigation query are performed, at least in part, on a network computing device located remotely from the user.

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[116] 171. (Amended) The computer program of claim [109] 164, wherein code segment that solicits additional input solicits the additional input in response to one or more deficiencies encountered during the constructing of the navigation query.

[117] 172. (Amended) The computer program of claim [116] 171, wherein the deficiencies include unresolved words of the spoken NL request.

[118] 173. (Amended) The computer program of claim [116] 171, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken NL request.

[119] 174. (Amended) The computer program of claim [109] 164, wherein the code segment that solicits the additional input solicits the additional input in response to one or more deficiencies encountered after a first navigation of the data source.

[120] 175. (Amended) The computer program of claim [119] 174, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

[121] 176. (Amended) The computer program of claim [119] 174, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

[122] 177. (Amended) The computer program of claim [109] 164, wherein code segment that solicits additional Input displays an option menu.

[123] 178. (Amended) The computer program of claim [122] 177, wherein the act of selecting from the displayed option menu is performed by speaking.

[124] 179. (Amended) The computer program of claim [109] 164, wherein the code segments of the computer program operate with respect to a plurality of simultaneous users and corresponding client devices.

[125] 180. (Amended) The computer program of claim [109] 164, further comprising a code segment that selects the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken NL request.

[126] 181. (Amended) The computer program of claim [109] 164, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

182. (New) A method for utilizing spoken natural language for navigating an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising the steps of:

(a) receiving a spoken natural language ("NL") request for desired information from the user;

(b) rendering an interpretation of the spoken request;

(c) constructing at least part of a navigation query based upon the interpretation;

(d) soliciting additional input from the user, including user interaction in a non-spoken modality different than the original request, in accordance with results generated from said at least part of a navigation query;

(e) refining the navigation query, based upon the additional input;

(f) using the refined navigation query to select a portion of the electronic data source; and

(g) transmitting the selected portion of the electronic data source from the network server to a client device of the user.

183. (New) The method of claim 182, wherein the input modality of step (d) includes

selecting from a displayed option menu.

184. (New) The method of claim 183, wherein the act of selecting from the displayed option menu is performed by speaking.

185. (New) A method for utilizing spoken natural language for navigating an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising the steps of:

(a) receiving a spoken natural language ("NL") request for desired information from the user;

(b) rendering an interpretation of the spoken request;

(c) constructing at least part of a navigation query based upon the interpretation;

(d) soliciting additional input from the user, including user interaction in a non-spoken modality different than the original request, in response to one or more deficiencies encountered during the step of constructing said at least part of a navigation query;

(e) refining the navigation query, based upon the additional input;

(f) using the refined navigation query to select a portion of the electronic data source; and

(g) transmitting the selected portion of the electronic data source from the network server to a client device of the user.

186. (New) The method of claim 185, wherein the input modality of step (d) includes selecting from a displayed option menu.

187. (New) The method of claim 186, wherein the act of selecting from the displayed option menu is performed by speaking.

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TO: Assistant Commissioner of Patents

FAX NO.: 703-746-7239

FROM: Kin-Wah Tong

DATE: August 5, 2002

MATTER: Serial No. 09/524,095 Filed: March 13, 2000

DOCKET NO.: SRI 1P037

APPLICANT: HALVERSON, et al

The following has been received in the U.S. Patent and Trademark Office on the date of this facsimile:

- ___ Petition
- ___ Disclosure Statement & PTO-1449
- ___ Priority Document
- ___ Drawings (___ sheets) informal
- X Response Under 37 CFR 1.111
- X Transmittal Letter (2 copies)
- ___ Fee Transmittal (2 copies)
- ___ Deposit Account Transaction
- X Facsimile Transmission Certificate dated AUGUST 5, 2002

CERTIFICATE OF TRANSMISSION UNDER 37 C.F.R. §1.8

I hereby certify that this correspondence is being transmitted by facsimile to the Assistant Commissioner for Patents, Washington, DC 20231 on AUGUST 5, 2002, Facsimile No. 703-746-7239.

Laura E. Crater
Name of person signing this certificate

Laura E. Crater AUGUST 5, 2002
Signature and date

Official

RECEIVED 8/6/02

PTO/SB/21 (08-00)

Please type a plus sign (+) inside this box → [+]

Approved for use through 10/31/2002. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	09/524,095
Filing Date	March 13, 2000
First Named Inventor	HALVERSON
Group Art Unit	2155
Examiner Name	F. BACKER
Attorney Docket Number	SRI 1 P 037
Total Number of Pages In This Submission	9

ENCLOSURES *(check all that apply)*

- [ ] Fee Transmittal Form
  - [ ] Fee Attached
- [x] Amendment / Response
  - [ ] After Final
  - [ ] Affidavits/declaration(s)
- [ ] Extension of Time Request
- [ ] Express Abandonment Request
- [ ] Information Disclosure Statement
- [ ] Certified Copy of Priority Document(s)
- [ ] Response to Missing Parts/ Incomplete Application
  - [ ] Response to Missing Parts under 37 CFR 1.52 or 1.53
- [ ] Assignment Papers *(for an Application)*
- [ ] Drawing(s)
- [ ] Licensing-related Papers
- [ ] Petition
- [ ] Petition to Convert to a Provisional Application
- [ ] Power of Attorney, Revocation Change of Correspondence Address
- [ ] Terminal Disclaimer
- [ ] Request for Refund
- [ ] CD, Number of CD(s)
- [ ] After Allowance Communication to Group
- [ ] Appeal Communication to Board of Appeals and Interferences
- [ ] Appeal Communication to Group *(Appeal Notice, Brief, Reply Brief)*
- [ ] Proprietary Information
- [ ] Status Letter
- [ ] Other Enclosure(s) *(please identify below)*:

Remarks: **Please charge the $138 additional claim fee (6 total claims at $9 each; 2 independent claims at $42 each) and any other fees due to Applicants' Attorneys' Deposit Account No. 20-0782. A duplicate copy of this transmittal is enclosed to facilitate the charge.**

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	KIN-WAH TONG, REG. NO. 39,400
Signature	K. W. Tong
Date	August 5, 2002

PTO/SB/21 (08-00)

Please type a plus sign (+) inside this box → [+]

Approved for use through 10/31/2002. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	09/524,095
Filing Date	March 13, 2000
First Named Inventor	HALVERSON
Group Art Unit	2155
Examiner Name	F. BACKER
Attorney Docket Number	SRI 1 P 037

Total Number of Pages in This Submission: 9

ENCLOSURES *(check all that apply)*

- [ ] Fee Transmittal Form
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- [ ] Appeal Communication to Group *(Appeal Notice, Brief, Reply Brief)*
- [ ] Proprietary Information
- [ ] Status Letter
- [ ] Other Enclosure(s) *(please identify below)*:

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Remarks	**Please charge the $138 additional claim fee (6 total claims at $9 each; 2 independent claims at $42 each) and any other fees due to Applicants' Attorneys' Deposit Account No. 20-0782. A duplicate copy of this transmittal is enclosed to facilitate the charge.**

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	KIN-WAH TONG, REG. NO. 39,400
Signature	K.W.T.
Date	August 5, 2002

D

Notice of Allowability	Application No.	Applicant(s)
	09/524,095	HALVERSON ET AL.
	Examiner	Art Unit
	Firmin Backer	3621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *August 7th, 2002*.
2. ☒ The allowed claim(s) is/are *56-187*.
3. ☐ The drawings filed on _____ are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.
5. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
   (a) ☐ The translation of the foreign language provisional application has been received.
6. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

7. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

8. ☒ CORRECTED DRAWINGS must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
   1) ☐ hereto or 2) ☐ to Paper No. ____.
   (b) ☐ including changes required by the proposed drawing correction filed _____, which has been approved by the Examiner.
   (c) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No. _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the top margin (not the back) of each sheet. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

9. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1☐ Notice of References Cited (PTO-892)
2☐ Notice of Informal Patent Application (PTO-152)
3☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
4☐ Interview Summary (PTO-413), Paper No.____ .
5☒ Information Disclosure Statements (PTO-1449), Paper No. 13 .
6☐ Examiner's Amendment/Comment
7☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
8☒ Examiner's Statement of Reasons for Allowance
9☐ Other .

Response to Amendment

This is in response to an amendment file on August 7^{th}, 2002. Claims 56, 82 and 101 have been amended and claims 127-187 have been added. Claims 56-187 are pending in the letter.

Allowable Subject Matter

1. Claims 56-187 are allowed.

2. The following is an examiner's statement of reasons for allowance:

a. Applicants teach an inventive concept for navigating network-based electronic data sources in response to spoken natural language input request. Applicants' inventive concept if novel and innovative in the sense that upon emerging of error or ambiguities in the interpretation of the spoken natural language, the system solicits additional input for the user in non-spoken modality that is different from the original request without requiring the user to request the non-spoken modality.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Firmin Backer whose telephone number is (703) 305-0624. The examiner can normally be reached on Mon-Thu 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Trammell can be reached on (703) 305-9768. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-7687 for regular communications and (703) 305-7687 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1113.

Firmin Backer
November 21, 2002

JAMES P. TRAMMELL
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3600

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

L

NOTICE OF ALLOWANCE AND FEE(S) DUE

#31

7590 12/16/2002

PERKINS COIE LLP
101 JEFFERSON DRIVE
MENLO PARK, CA 94025-1114

EXAMINER	
BACKER, FIRMIN	
ART UNIT	CLASS-SUBCLASS
3621	709-218000

DATE MAILED: 12/16/2002

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/524,095	03/13/2000	Christine Halverson	SRI1P037	6294

TITLE OF INVENTION: NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$640	$0	$640	03/17/2003

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE REFLECTS A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE APPLIED IN THIS APPLICATION. THE PTOL-85B (OR AN EQUIVALENT) MUST BE RETURNED WITHIN THIS PERIOD EVEN IF NO FEE IS DUE OR THE APPLICATION WILL BE REGARDED AS ABANDONED.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status is changed, pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above and notify the United States Patent and Trademark Office of the change in status, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check the box below and enclose the PUBLICATION FEE and 1/2 the ISSUE FEE shown above.

☐ Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

II. PART B - FEE(S) TRANSMITTAL should be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). Even if the fee(s) have already been paid, Part B - Fee(s) Transmittal should be completed and returned. If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Box ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail Box ISSUE FEE
Commissioner for Patents
Washington, D.C. 20231
Fax (703)746-4000

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 4 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Legibly mark-up with any corrections or use Block 1)

7590 12/16/2002

PERKINS COIE LLP
101 JEFFERSON DRIVE
MENLO PARK, CA 94025-1114

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Box Issue Fee address above, or being facsimile transmitted to the USPTO, on the date indicated below.

(Depositor's name)

(Signature)

(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/524,095	03/13/2000	Christine Halverson	SRI1P037	6294

TITLE OF INVENTION: NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$640	$0	$640	03/17/2003

EXAMINER	ART UNIT	CLASS-SUBCLASS
BACKER, FIRMIN	3621	709-218000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1. ____________
2. ____________
3. ____________

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. Inclusion of assignee data is only appropriate when an assignment has been previously submitted to the USPTO or is being submitted under separate cover. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) ❑ individual ❑ corporation or other private group entity ❑ government

4a. The following fee(s) are enclosed:

❑ Issue Fee

❑ Publication Fee

❑ Advance Order - # of Copies ____________

4b. Payment of Fee(s):

❑ A check in the amount of the fee(s) is enclosed.

❑ Payment by credit card. Form PTO-2038 is attached.

❑ The Commissioner is hereby authorized by charge the required fee(s), or credit any overpayment, to Deposit Account Number ____________ (enclose an extra copy of this form).

Commissioner for Patents is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above.

(Authorized Signature) (Date)

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, D.C. 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, Washington, DC 20231.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TRANSMIT THIS FORM WITH FEE(S)

PTOL-85 (REV. 04-02) Approved for use through 01/31/2004. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/524,095	03/13/2000	Christine Halverson	SRI1P037	6294

7590 12/16/2002

PERKINS COIE LLP
101 JEFFERSON DRIVE
MENLO PARK, CA 94025-1114
UNITED STATES

EXAMINER	
BACKER, FIRMIN	
ART UNIT	**PAPER NUMBER**
3621	

DATE MAILED: 12/16/2002

Determination of Patent Term Extension under 35 U.S.C. 154 (b)
(application filed after June 7, 1995 but prior to May 29, 2000)

The patent term extension is 0 days. Any patent to issue from the above identified application will include an indication of the 0 day extension on the front page.

If a continued prosecution application (CPA) was filed in the above-identified application, the filing date that determines patent term extension is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) system. (http://pair.uspto.gov)

Any questions regarding the patent term extension or adjustment determination should be directed to the Office of Patent Legal Administration at (703)305-1383.

PTOL-85 (REV. 04-02) Approved for use through 01/31/2004.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/524,095	03/13/2000	Christine Halverson	SRI1P037	6294

7590 12/16/2002

PERKINS COIE LLP
101 JEFFERSON DRIVE
MENLO PARK, CA 94025-1114
UNITED STATES

EXAMINER	
BACKER, FIRMIN	
ART UNIT	**PAPER NUMBER**
3621	

DATE MAILED: 12/16/2002

Notice of Fee Increase on January 1, 2003

If a reply to a "Notice of Allowance and Fee(s) Due" is filed in the Office on or after January 1, 2003, then the amount due will be higher than that set forth in the "Notice of Allowance and Fee(s) Due" since there will be an increase in fees effective on January 1, 2003. See Revision of Patent and Trademark Fees for Fiscal Year 2003; Final Rule, 67 Fed. Reg. 70847, 70849 (November 27, 2002).

The current fee schedule is accessible from: http://www.uspto.gov/main/howtofees.htm.

If the issue fee paid is the amount shown on the "Notice of Allowance and Fee(s) Due," but not the correct amount in view of the fee increase, a "Notice to Pay Balance of Issue Fee" will be mailed to applicant. In order to avoid processing delays associated with mailing of a "Notice to Pay Balance of Issue Fee," if the response to the Notice of Allowance and Fee(s) due form is to be filed on or after January 1, 2003 (or mailed with a certificate of mailing on or after January 1, 2003), the issue fee paid should be the fee that is required at the time the fee is paid. If the issue fee was previously paid, and the response to the "Notice of Allowance and Fee(s) Due" includes a request to apply a previously-paid issue fee to the issue fee now due, then the difference between the issue fee amount at the time the response is filed and the previously paid issue fee should be paid. See Manual of Patent Examining Procedure, Section 1308.01 (Eighth Edition, August 2001).

Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at (703) 305-8283.

PTOL-85 (REV. 04-02) Approved for use through 01/31/2004.

(2)

UW

#32
CA
4-25-03

IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE

PATENT APPLICATION

Applicant: **Halverson et al.**

Case: **SRI1P037**

Serial No.: **09/524,095** Filed: **March 13, 2000**

Group Art Unit: **3621**

Examiner: **Firmin Backer**

Title: **NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK**

ASSISTANT COMMISSIONER FOR PATENTS
Box Issue Fee
Washington, D. C. 20231

S I R:

Comments on Statement of Reasons for Allowance

This response addresses the Notice of Allowance dated December 16, 2002.

REMARKS

Applicants' representative would like to thank Examiner Firmin Backer for kindly allowing claims 56-187 of the present application. However, Applicants have reviewed the Examiner's Reasons for Allowance and have the following comments:

1. The Examiner stated that:

> "Applicants teach an inventive concept for navigating network-based electronic data sources in response to spoken natural language input request. Applicants' inventive concept [if] **is** novel and innovative in the sense that upon emerging of error or ambiguities in the interpretation of the spoken natural language, the system solicits additional input for the user in non-spoken modality that is different from the original request without requiring the user to request the non-spoken modality." (Emphasis and correction added)

It appears that there is a typographical error in the second sentence where the Examiner used the term "if" instead of "is". It is Applicants' interpretation that the Examiner intended to use the term "is". If the Examiner disagrees, it is respectfully requested that the Examiner resolve the ambiguity of the sentence.

Conclusion

Thus, the Applicants submit the present comments solely to clarify various issues raised by the Notice of Allowance. Once again, Applicants' representative would like to thank Firmin Backer for kindly allowing claims 56-187of the present application.

If, however, the Examiner believes that there are any unresolved issues, it is requested that the Examiner telephone Mr. Kin-Wah Tong, Esq. at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

3/17/03

Kin-Wah Tong, Attorney
Reg. No. 39,400
(732) 530-9404

Moser, Patterson & Sheridan, LLP
595 Shrewsbury Avenue
First Floor, Suite 100
Shrewsbury, New Jersey 07702

2155 #33 5-2-03 Attorney Docket 59501-8037.US01

I hereby certify that this correspondence is being deposited with the U.S. Postal Service with sufficient postage as First Class Mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C., 20231, on:

Date: August 6, 2002 By: Jamie L. Hughes
Jamie L. Hughes

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF:
Halverson
APPLICATION NO.: 09/524,095
FILED: 03/13/2000
FOR: **NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK**

EXAMINER: BACKER
ART UNIT: 2155

Information Disclosure Statement After First Office Action but Before Final Action or Notice of Allowance – 37 CFR 1.97(c)

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

1. Timing of Submission

The information transmitted herewith is being filed *after* three months of the filing date of this application or after the mailing date of the first Office action on the merits, whichever occurred last, but *before* the mailing date of either a final action under 37 CFR 1.113 or a Notice of Allowance under 37 CFR 1.311, whichever occurs first. The references listed on the enclosed Form PTO/SB/08A may be material to the examination of this application; the Examiner is requested to make them of record in the application.

08/14/2002 SMINASS1 00000008 502207 09524095
01 FC:126 180.00 CH

2. Cited Information

☒ Copies of the following references are enclosed:

☒ All cited references

3. Effect of Information Disclosure Statement (37 CFR 1.97(h))

This Information Disclosure Statement is not to be construed as a representation that: (i) a search has been made; (ii) additional information material to the examination of this application does not exist; (iii) the information, protocols, results and the like reported by third parties are accurate or enabling; or (iv) the cited information is, or is considered to be, material to patentability. In addition, applicant does not admit that any enclosed item of information constitutes prior art to the subject invention and specifically reserves the right to demonstrate that any such reference is not prior art.

4. Fee Payment (37 CFR 1.97(c)) or Certification (37 CFR 1.97(e))

☒ Applicant elects to pay the fee under 37 CFR 1.17(p) $180.00.

☐ Check enclosed for $.
☒ Please charge the above fee(s) to Deposit Account No. 50-2207 this paper is provided in triplicate.

Respectfully submitted,
Perkins Coie LLP

Brian R. Coleman
Registration No. 39,145

Date: 6 Aug 2002

Correspondence Address:
Customer No. 22918
Perkins Coie LLP
P.O. Box 2168
Menlo Park, California 94026
(650) 838-4300

OIPE
AUG 13 2002

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
Form PTO-1449 (Modified)
(Use several sheets if necessary)

Sheet 1 of 3

COMPLETE IF KNOWN	
Application Number	09/542,09_
Confirmation Number	
Filing Date	March 13, 2000
First Named Inventor	Halverson
Group Art Unit	2155
Examiner Name	Backer
Attorney Docket No.	59501-8037.US01

RECEIVED
AUG 1 5 2002
Technology Center 2100

U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	U.S. Patent or Application NUMBER	Kind Code (if known)	Name of Patentee or Inventor of Cited Document	Date of Publication or Filing Date of Cited Document	Pages, Columns, Lines, Where Relevant Figures Appear
F.B	1	5,197,005		Schwartz et al.	3/23/93	
	2	5,386,556		Hedin et al.	1/31/95	
	3	5,434,777		Luciw	7/18/95	
	4	5,519,608		Kupiec	5/21/96	
	5	5,608,624		Luciw	3/4/97	
	6	5,721,938		Stuckey	2/24/98	
	7	5,729,659		Potter	3/17/98	
	8	5,748,974		Johnson	5/5/98	
	9	5,774,859		Houser et al.	6/30/98	
F.B	10	5,794,050		Dahlgren et al.	8/11/98	

FOREIGN PATENT DOCUMENTS

Examiner Initial	Cite No.	Office	NUMBER	Kind Code (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication or Filing Date of Cited Document	Pages, Columns, Lines, Where Relevant Figures Appear	T
F.B	11	WO	00/11869		Ellis et al.	3/2/00		
F.B	12	EP	0 803 826 A2		Lindblad et al.	10/29/97		

OTHER PRIOR ART-NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T
F.B	13	Dowding, John et al., "Gemini: A Natural Language System For Spoken-Language Understanding", SRI International	
	14	http://www.ai.sri.com/~oaa/infowiz.html, "InfoWiz: An Animated Voice Interactive Information System, May 8, 2000	
	15	Dowding, John, "Interleaving Syntax and Semantics in an Efficient Bottom-up Parser", SRI International	
F.B	16	Moore, Robert et al., "Combining Linguistic and Statistical Knowledge Sources in a Natural-Language Processing for ATIS", SRI International	

EXAMINER	DATE CONSIDERED
[signature]	8/30/02

*EXAMINER: Initial if reference considered, whether or not criteria is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to application(s).

BY022170

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
Form PTO-1449 (Modified)
(Use several sheets if necessary)

Sheet	2	of	3

COMPLETE IF KNOWN	
Application Number	0[illegible]42,095
Confirmation Number	
Filing Date	March 13, 2000
First Named Inventor	Halverson
Group Art Unit	2155
Examiner Name	Backer
Attorney Docket No.	59501-8037.US01

U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	U.S. Patent or Application NUMBER	Kind Code (if known)	Name of Patentee or Inventor of Cited Document	Date of Publication or Filing Date of Cited Document	Pages, Columns, Lines, Where Relevant Figures Appear
F.H	17	5,802,526		Fawcett et al.	9/1/98	
	18	6,192,338		Haszto et al.	2/2001	
	19	6,173,279		Levin et al.	1/2001	
	20	5,805,775		Eberman et al.	9/8/98	
	21	5,855,002		Armstrong	12/29/98	
	22	5,890,123		Brown et al.	3/30/99	
	23	5,963,940		Liddy et al.	10/5/99	
	24	6,003,072		Gerritsen et al	12/14/99	
	25	6,012,030		French-St. George et al.	1/4/00	
	26	6,026,388		Liddy et al.	2/15/00	
	27	6,080,202		Strickland et al.	6/27/00	
F.H	28	6,021,427		Spagna et al.	1/1/00	

OTHER PRIOR ART-NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, ~~etc.), date,~~ page(s), volume issue number(s), publisher, city and/or country where published.	T
F.H	29	Stent, Amanda et al., "The CommandTalk Spoken Dialog System", SRI International	
	30	Moore, Robert et al., "CommandTalk: A Spoken-Language Interface for Battlefield Simulations:, October 23, 1997, SRI International	
	31	Dowding, John et al., "Interpreting Language in Context in CommandTalk", February 5, 1999, SRI International	
	32	Moran, Douglas B. et al., "Intelligent Agent-based User Interfaces", Article Intelligence center, SRI International	
F.H	33	Martin, David L. et al., "Building Distributed Software Systems with the Open Agent Architecture"	

EXAMINER	DATE CONSIDERED
[signature]	8/30/02

*EXAMINER: Initial if reference considered, whether or not criteria is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to application(s).

BY022170

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AUG 13 2002

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

Form PTO-1449 (Modified)

(Use several sheets if necessary)

Sheet	3	of	3

COMPLETE IF KNOWN	
Application Number	0_42,095
Confirmation Number	
Filing Date	March 13, 2000
First Named Inventor	Halverson
Group Art Unit	2155
Examiner Name	Backer
Attorney Docket No.	59501-8037.US01

Technology Center 2100

U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	U.S. Patent or Application NUMBER	Kind Code (if known)	Name of Patentee or Inventor of Cited Document	Date of Publication or Filing Date of Cited Document	Pages, Columns, Lines, Where Relevant Figures Appear
F.B.	34	6,338,081		Furusawa et al.	1/8/02	
	35	6,144,989		Hodjat et al.	11/7/00	
F.B.	36	6,226,666		Chang et al.	5/1/01	

OTHER PRIOR ART-NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume issue number(s), publisher, city and/or country where published.	T
F.B.	37	Julia, Luc. et al., "Cooperative Agents and Recognition System (CARS) for Drivers and Passengers", SRI International	
	38	Moran, Douglas et al., "Multimodal User Interfaces in the Open Agent Architecture"	
	39	Cheyer, Adam et al., "Multimodal Maps: An Agent-based Approach", SRI International	
	40	Cutkosky, Mark R. et al., "An Experiment in Integrating Concurrent Engineering Systems"	
	41	Martin, David et al., "Development Tools for the Open Agent Architecture", The Practical Application of Intelleigent Agents and Multi-Agent Technology (PAAM96), London, April 1996	
	42	Cheyer, Adam et al.,"The Open Agent Architecturetm", SRI International, AI center	
	43	Dejima, Inc., http://www.dejima.com/	
	44	Cohen, Philip et al., "An Open Agent Architecture", AAAI Spring Symposium, pp1-8, March 1994	
F.B.	45	Martin, David et al., "Information Brokering in an Agent Architecture", Proceeding of the 2nd Int'l Conference on Practical Application of Intelligent Agents & Multi-Agent Technology, London, April 1997	

EXAMINER	DATE CONSIDERED
Francisco Backer	8/30/02

*EXAMINER: Initial if reference considered, whether or not criteria is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to application(s).

BY022170

OIPE JC64
MAR 2 4 2003
PATENT & TRADEMARK OFFICE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

#35 MK

In re application of: Halverson, et al.

Serial No.: 09/524,095 Art Unit: 3621

Filing Date: March 13, 2000 Examiner: Backer, Firmin

For: NAVIGATING NETWORK-BASED ELECTRONIC INFOMRATION USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK

Docket No. SRI 4116-3

Assistant Commissioner for Patents
Washington, D.C. 20231
S I R:

SUBMISSION OF FORMAL DRAWINGS

The Applicants submit herewith 7 sheets of formal drawings (FIGS. 1 through 6), properly labeled, in connection with the above-captioned application. The Examiner is requested to substitute these formal drawings for the informal drawings previously submitted.

Respectfully submitted,

Dated: March 17, 2003

KIN-WAH TONG
Reg. No. 39,400
(732) 530-9404

Moser, Patterson & Sheridan, LLP
595 Shrewsbury Avenue
Suite 100
Shrewsbury, NJ 07702

CERTIFICATE OF MAILING under 37 C.F.R. 1.8(a)

I hereby certify that this correspondence is being deposited on March 17, 2003, with the United States Postal Service as first class mail, with sufficient postage, in an envelope addressed to the Commissioner for Patents, Box Issue Fee, Washington, D.C. 20231.

Linda DeNardi
Signature

March 17, 2003
Date of signature

12/02

09524095

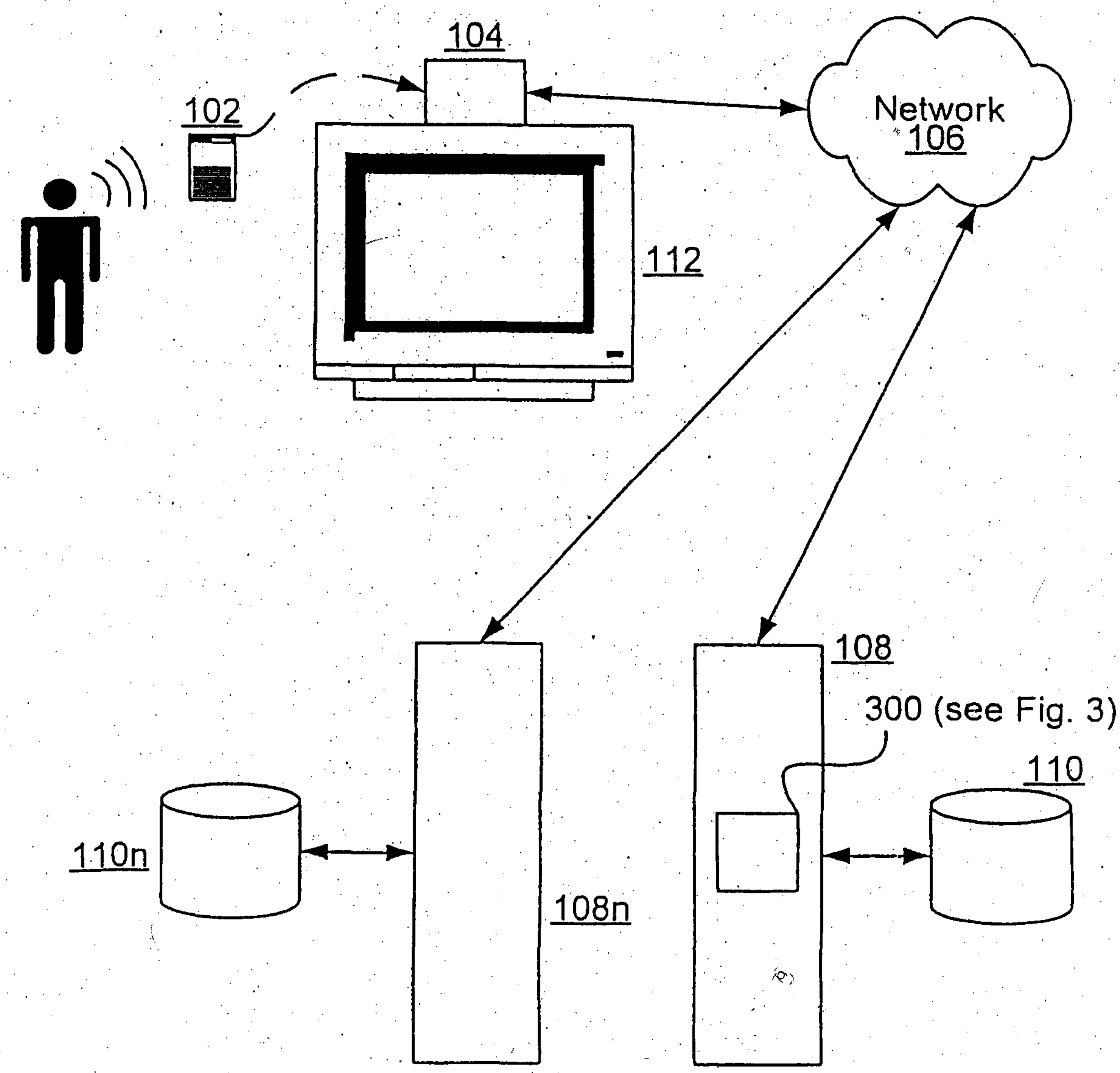

Fig. 1a

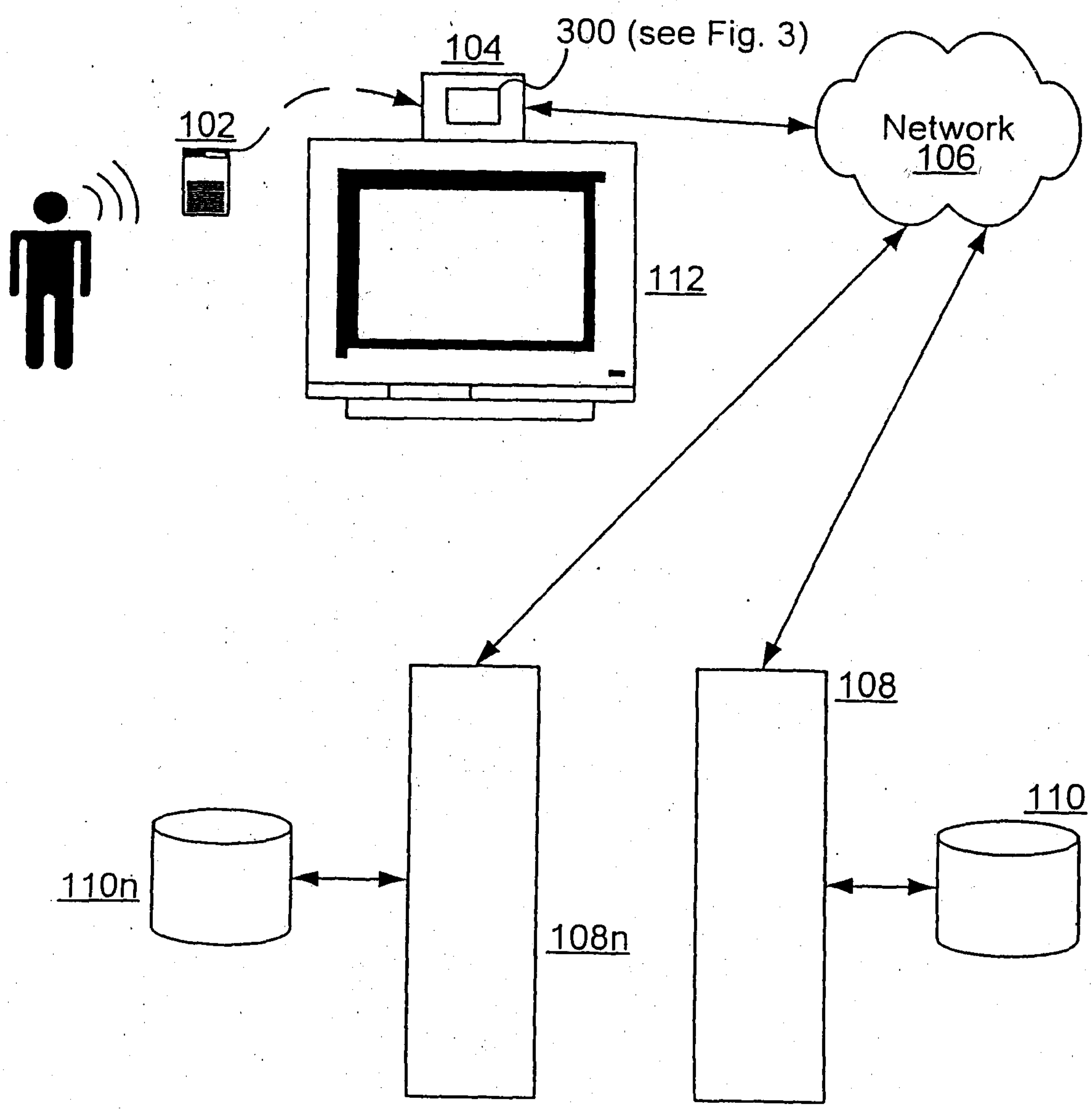

Fig. 1b

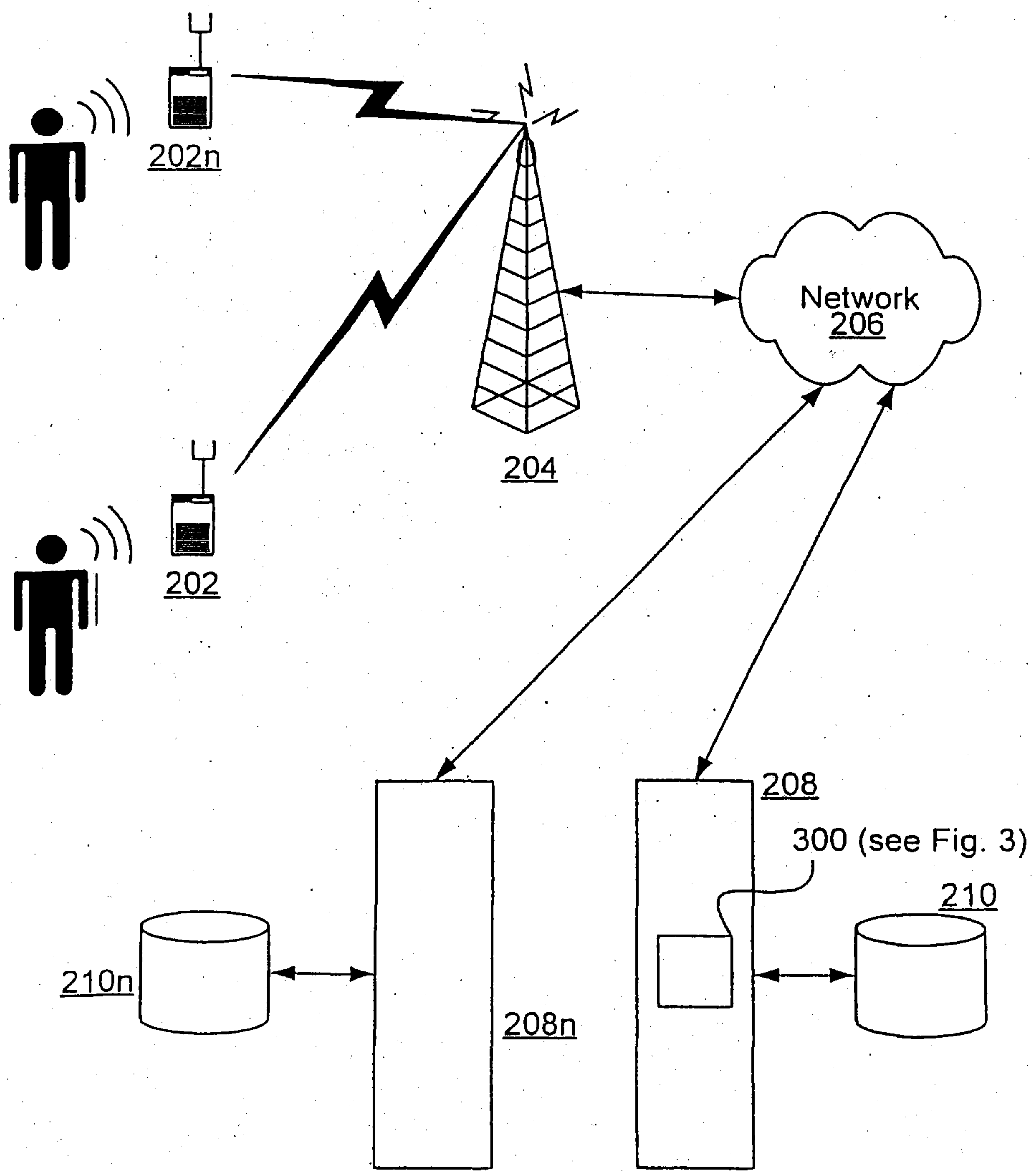

Fig. 2

REQUEST PROCESSING LOGIC 300

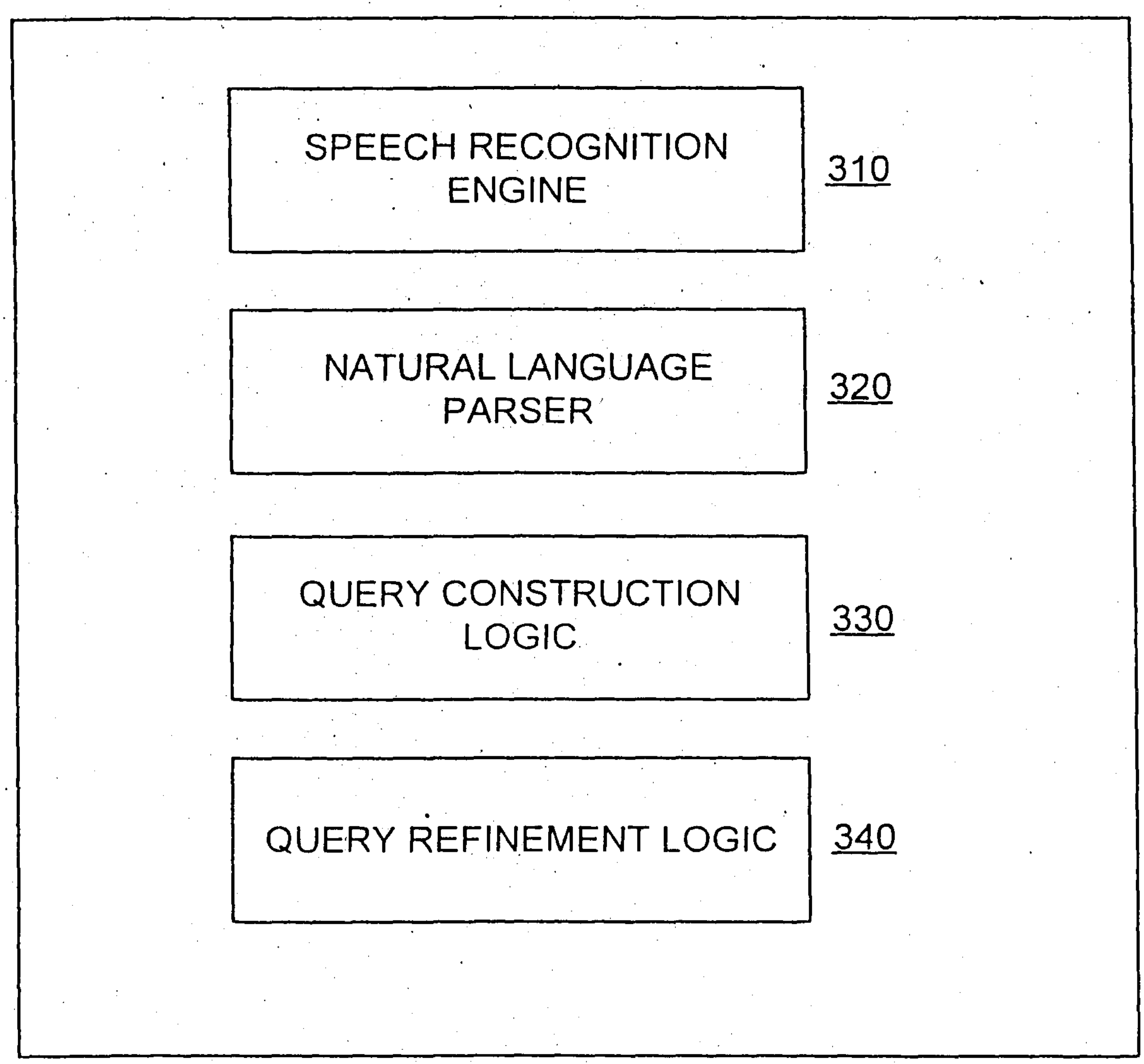

Fig. 3

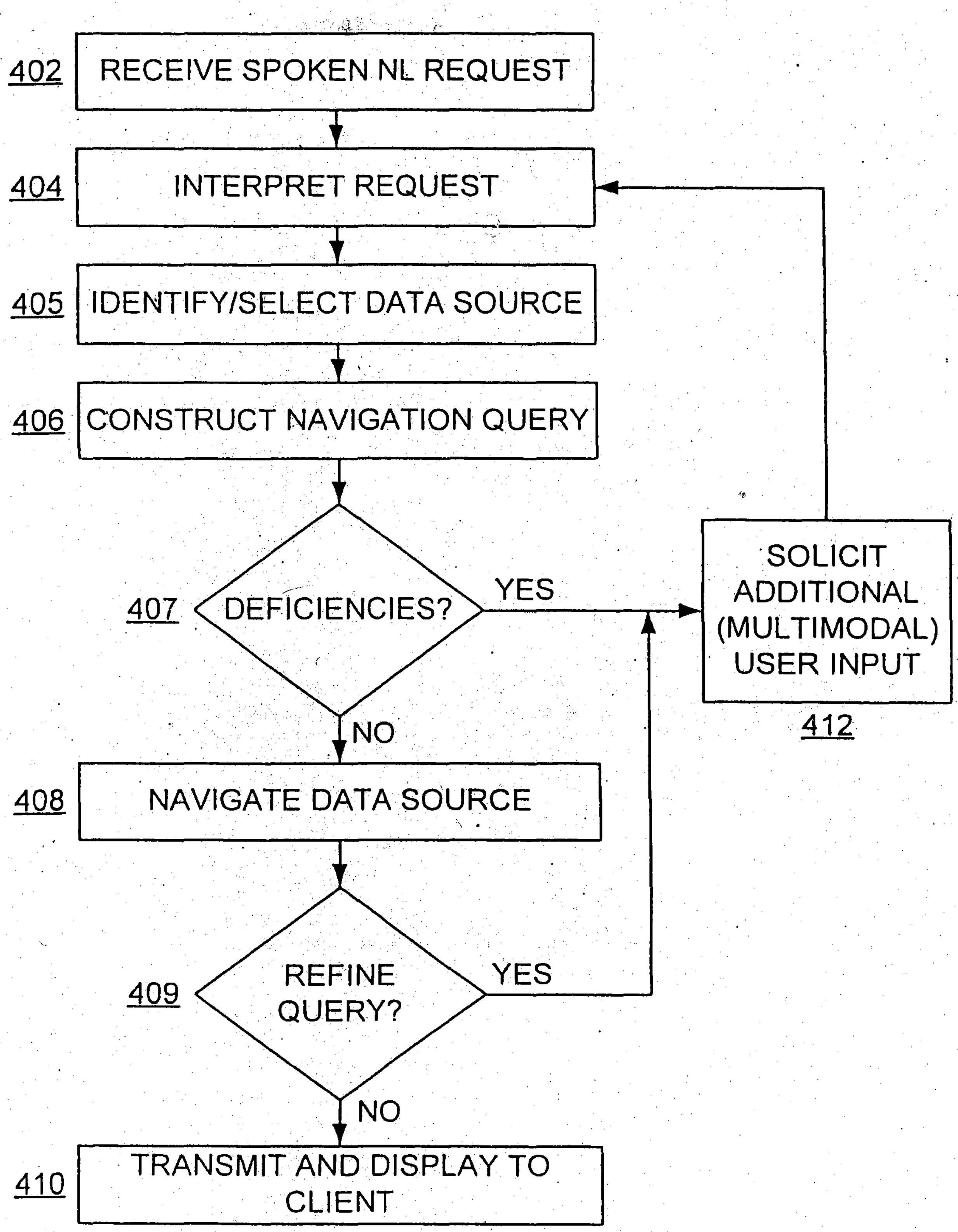
402
RECEIVE SPOKEN NL REQUEST
404
INTERPRET REQUEST
405
IDENTIFY/SELECT DATA SOURCE
406
CONSTRUCT NAVIGATION QUERY
407
DEFICIENCIES?
YES
NO
SOLICIT ADDITIONAL (MULTIMODAL) USER INPUT
412
408
NAVIGATE DATA SOURCE
409
REFINE QUERY?
YES
NO
410
TRANSMIT AND DISPLAY TO CLIENT

Fig. 4

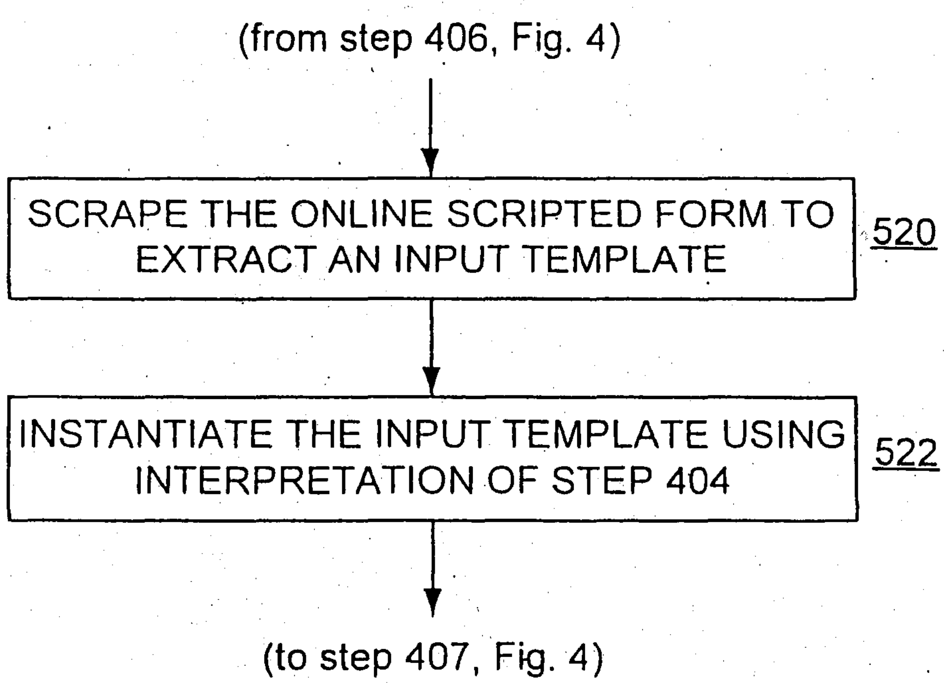
(from step 406, Fig. 4)
SCRAPE THE ONLINE SCRIPTED FORM TO EXTRACT AN INPUT TEMPLATE
520
INSTANTIATE THE INPUT TEMPLATE USING INTERPRETATION OF STEP 404
522
(to step 407, Fig. 4)

Fig. 5

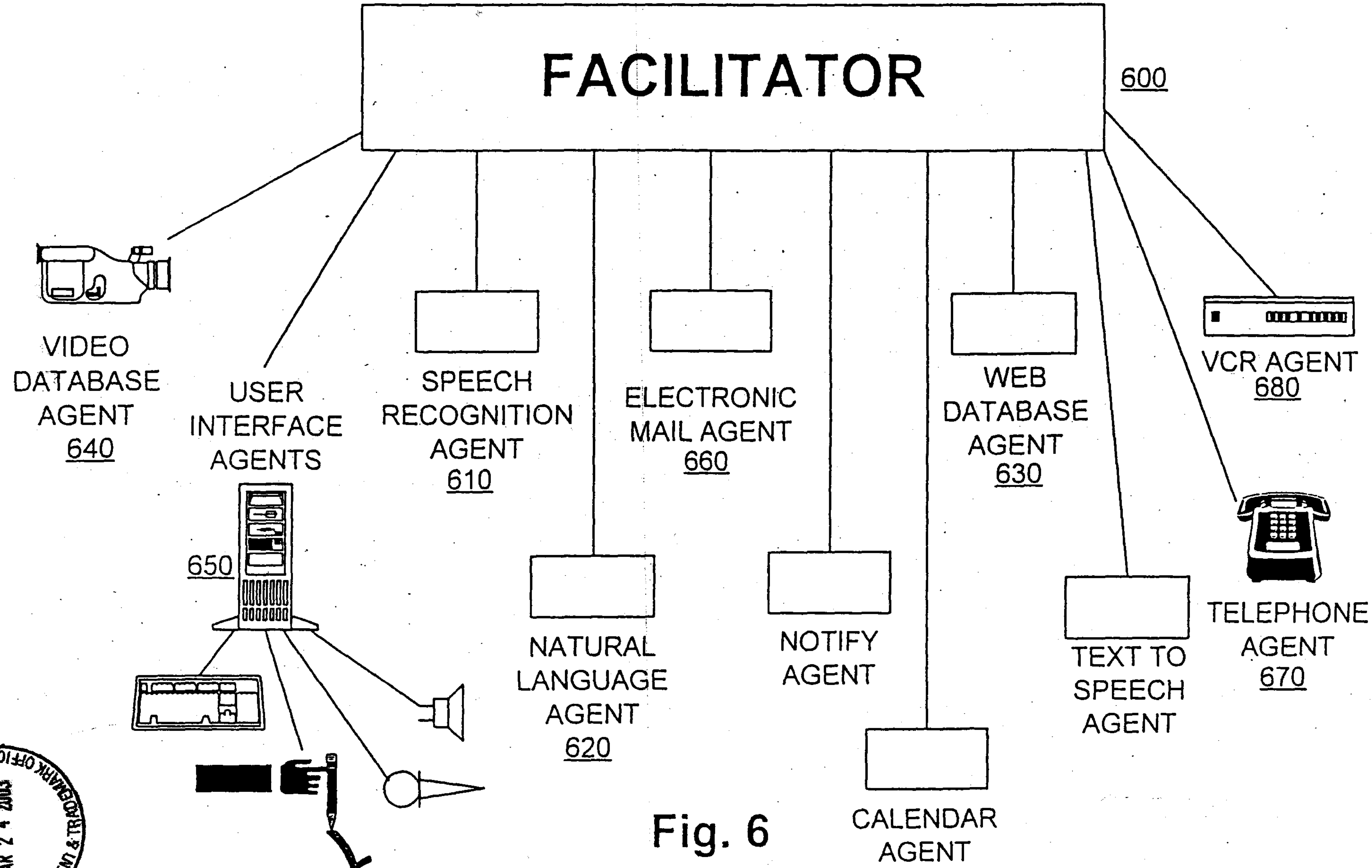
FACILITATOR
600
VIDEO DATABASE AGENT 640
USER INTERFACE AGENTS
650
SPEECH RECOGNITION AGENT 610
NATURAL LANGUAGE AGENT 620
ELECTRONIC MAIL AGENT 660
NOTIFY AGENT
CALENDAR AGENT
WEB DATABASE AGENT 630
TEXT TO SPEECH AGENT
VCR AGENT 680
TELEPHONE AGENT 670

Fig. 6

CW

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail Box ISSUE FEE
Commissioner for Patents
Washington, D.C. 20231
Fax (703)746-4000

OIPE MAR 2 4 2003

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 4 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

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7590 12/16/2002

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02 FC:8001 3.00 CH

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Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Box Issue Fee address above, or being facsimile transmitted to the USPTO, on the date indicated below.

LINDA DENARDI (Depositor's name)
Linda DiNardi (Signature)
MARCH 17, 2003 (Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/524,095	03/13/2000	Christine Halverson	SRI1P037	6294

TITLE OF INVENTION: NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$640	$0	$640	03/17/2003

EXAMINER	ART UNIT	CLASS-SUBCLASS
BACKER, FIRMIN	3621	709-218000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Moser, Patterson & Sheridan, LLP.
2 Kin-Wah Tong, Esq.
3 ______

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. Inclusion of assignee data is only appropriate when an assignment has been previously submitted to the USPTO or is being submitted under separate cover. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: SRI International, INc.

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Menlo Park, CA

Please check the appropriate assignee category or categories (will not be printed on the patent) ☐ individual ☒ corporation or other private group entity ☐ government

4a. The following fee(s) are enclosed:

☒ Issue Fee
☐ Publication Fee
☒ Advance Order - # of Copies 1

4b. Payment of Fee(s):

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☐ Payment by credit card. Form PTO-2038 is attached.
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Commissioner for Patents is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above.

(Authorized Signature) K.W.T. (Date) 3/17/03

Kin-Wah Tong, Esq.

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, D.C. 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, Washington, DC 20231.

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PTOL-85 (REV. 04-02) Approved for use through 01/31/2004. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

#36 PAT REV

*RETURN TO FMF - LOCATION 7540

QUERY CONTROL FORM			RTIS USE ONLY
Application No. 09/532,095	Prepared by BOB		Tracking Number
Examiner-GAU BACKER, F	Date 3-12-04		Week Date
3621	No. of queries 1		

JACKET			
a. Serial No.	f. Foreign Priority	k. Print Claim(s)	p. PTO-1449
b. Applicant(s)	g. Disclaimer	l. Print Fig.	q. PTOL-85b
c. Continuing Data	h. Microfiche Appendix	m. Searched Column	r. Abstract
d. PCT	i. Title	n. PTO-270/328	s. Sheets/Figs
e. Domestic Priority	j. Claims Allowed	o. PTO-892	t. Other

SPECIFICATION	
a. Page Missing	MESSAGE PTO-1449 A) not completed. Please sign, initial, and or line through. Please resolve
b. Text Continuity	
c. Holes through Data	
d. Other Missing Text	
e. Illegible Text	
f. Duplicate Text	
g. Brief Description	
h. Sequence Listing	
i. Appendix	RECEIVED
j. Amendments	MAR 16 2004
k. Other	Publishing Division 13
CLAIMS	
a. Claim(s) Missing	
b. Improper Dependency	
c. Duplicate Numbers	Thanks
d. Incorrect Numbering	initials BOB
e. Index Disagrees	RESPONSE
f. Punctuation	
g. Amendments	
h. Bracketing	
i. Missing Text	
j. Duplicate Text	
k. Other	
	initials

E-5 (Rev. 10/15/02) *LOCATION 7540

UNITED STATES PAT[illegible] AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
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Alexandria, VA 22313-1450
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OPPENHEIMER WOLFF & DONNELLY
P. O. BOX 10356
PALO ALTO CA 94303

DATE PRINTED

12/03/07

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According to the records of the U.S. Patent and Trademark Office (USPTO) the maintenance fee for the patent(s) listed below (for which the above address is on record as the fee address under 37 CFR 1.363) has not been paid within the six-month period set forth in 37 CFR 1.362(d). THE MAINTENANCE FEE MAY STILL BE PAID WITH THE APPLICABLE SURCHARGE SET FORTH IN 37 CFR 1.20(h), WITHIN THE SIX-MONTH GRACE PERIOD SET FORTH IN 37 CFR 1.362(e).

Unless payment of the maintenance fee and the applicable surcharge is received in the USPTO within the six-month grace period, THE PATENT WILL EXPIRE AS OF THE END OF THE GRACE PERIOD. 35 U.S.C. 41(b).

The total payment due is the amount required on the date the fee is paid (and not necessarily the amount indicated below). All USPTO fees (including maintenance fees) are subject to change. Customers should refer to the USPTO Web site (www.uspto.gov) or call the Maintenance Fee Branch at 571-272-6500 for the most current fee amounts for the correct entity status before submitting payment. The total payment due indicated below is based on the entity status according to current Office records (shown below).

Timely payment of the total payment due is required in order to avoid expiration of the patent. A maintenance fee payment can be timely made using the certificate of mailing or transmission procedure set forth in 37 CFR 1.8.

PATENT NUMBER	FEE AMT	MAINT. SURCHG	U.S. APPL NUMBER	PATENT ISSUE DATE	APPL. FILING DATE	PAY-MENT YEAR	SMALL ENTITY?	TOTAL PYMT DUE	ATTORNEY DOCKET NUMBER
[redacted]	930	130	09524095	05/25/04	03/13/00	4	NO	1060	SR11P037

The maintenance fee and the applicable surcharge can be paid quickly and easily over the Internet at www.uspto.gov by electronic funds transfer (EFT), credit card, or USPTO deposit account payment methods. The mailing address for all maintenance fee payments not electronically submitted over the Internet is: U.S. Patent and Trademark Office, P.O. Box 979070, St. Louis, MO 63197-9000.

Direct any questions about this notice to: Mail Stop M Correspondence, Director of the United States Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450.

NOTE: This notice was automatically generated based on the amount of time that elapsed since the date a patent was granted. It is possible that the patent term may have ended or been shortened due to a terminal disclaimer that was filed in the application. Also, for any patent that issued from an application filed on or after June 8, 1995 containing a specific reference to an earlier filed application or applications under 35 U.S.C. 120, 121, or 365(c), the patent term ends 20 years from the date on which the earliest such application was filed, unless the term was adjusted or extended under 35 U.S.C. 154 or 156. Patentee should determine the relevant patent term for a patent before paying the maintenance fee.

MF4401 (7/2007)

101

PATENT APPLICATION FEE DETERMINATION RECORD Effective December 29, 1999	Application or Docket Number 09/524095

CLAIMS AS FILED - PART I

FOR	NUMBER FILED (Column 1)		NUMBER EXTRA (Column 2)	SMALL ENTITY TYPE RATE	SMALL ENTITY FEE	OR	OTHER THAN SMALL ENTITY RATE	OTHER THAN SMALL ENTITY FEE
BASIC FEE					345.00	OR		690.00
TOTAL CLAIMS	55	minus 20=	* 35	X$ 9=		OR	X$18=	630 -
INDEPENDENT CLAIMS	3	minus 3 =	*	X39=		OR	X78=	–
MULTIPLE DEPENDENT CLAIM PRESENT			N	+130=		OR	+260=	–
				TOTAL		OR	TOTAL	1320 -

* If the difference in column 1 is less than zero, enter "0" in column 2

CLAIMS AS AMENDED - PART II

AMENDMENT A

	CLAIMS REMAINING AFTER AMENDMENT (Column 1)		HIGHEST NUMBER PREVIOUSLY PAID FOR (Column 2)	PRESENT EXTRA (Column 3)	SMALL ENTITY RATE	ADDITIONAL FEE	OR	OTHER THAN SMALL ENTITY RATE	ADDITIONAL FEE
Total	* 71	Minus	**	=	X$ 9=		OR	X$18=	
Independent	* 3	Minus	***	=	X39=		OR	X78=	
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM					+130=		OR	+260=	
					TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT B

	CLAIMS REMAINING AFTER AMENDMENT (Column 1)		HIGHEST NUMBER PREVIOUSLY PAID FOR (Column 2)	PRESENT EXTRA (Column 3)	SMALL ENTITY RATE	ADDITIONAL FEE	OR	OTHER THAN SMALL ENTITY RATE	ADDITIONAL FEE
Total	* 126	Minus	** 71	= 56	X$ 9=	495	OR	X$18=	
Independent	* 6	Minus	*** 3	= 3	X39=	117	OR	X78=	
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM					+130=		OR	+260=	
					TOTAL ADDIT. FEE	612	OR	TOTAL ADDIT. FEE	

AMENDMENT C

	CLAIMS REMAINING AFTER AMENDMENT (Column 1)		HIGHEST NUMBER PREVIOUSLY PAID FOR (Column 2)	PRESENT EXTRA (Column 3)	SMALL ENTITY RATE	ADDITIONAL FEE	OR	OTHER THAN SMALL ENTITY RATE	ADDITIONAL FEE
Total	* 132	Minus	** 126	= 6	X$ 9=	54	OR	X$18=	
Independent	* 8	Minus	*** 6	= 2	X42 ~~X39~~=	84	OR	X78=	
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM					+130=		OR	+260=	
					TOTAL ADDIT. FEE	138	OR	TOTAL ADDIT. FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."
***If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

FORM PTO-875
(Rev. 12/99)

Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE
*U.S. GPO: 2000-463-433/29044

PATENT APPLICATION FEE DETERMINATION RECORD
Effective October 1, 2000

Application or Docket Number
09/524,095

RCE

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)	SMALL ENTITY TYPE ☐		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE	FEE		RATE	FEE
BASIC FEE				$355	OR		$740
TOTAL CLAIMS	minus 20=	*	X$ 9=		OR	X$18=	
INDEPENDENT CLAIMS	minus 3 =	*	X40=		OR	X84=	
MULTIPLE DEPENDENT CLAIM PRESENT			+135 =		OR	+280=	
			TOTAL		OR	TOTAL	740- pd

* If the difference in column 1 is less than zero, enter "0" in column 2

CLAIMS AS AMENDED - PART II

AMENDMENT A

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE	ADDITIONAL FEE	OR	OTHER THAN SMALL ENTITY RATE	ADDITIONAL FEE
Total	*	Minus	**	=	X$ 9=		OR	X$18=	
Independent	*	Minus	***	=	X40=		OR	X84=	
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM					+135 =		OR	+280-	
					TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT B

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE	ADDITIONAL FEE	OR	RATE	ADDITIONAL FEE
Total	*	Minus	**	=	X$ 9=		OR	X$18=	
Independent	*	Minus	***	=	X40=		OR	X84	
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM					+135=		OR	+280=	
					TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT C

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE	ADDITIONAL FEE	OR	RATE	ADDITIONAL FEE
Total	*	Minus	**	=	X$ 9=		OR	X$18=	
Independent	*	Minus	***	=	X40=		OR	X84	
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM					+135=		OR	+280	
					TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

FORM PTO-875 Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

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(12) **United States Patent**
Halverson et al.

(10) **Patent No.: US 6,742,021 B1**
(45) **Date of Patent: May 25, 2004**

(54) **NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN INPUT WITH MULTIMODAL ERROR FEEDBACK**

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(73) Assignee: **SRI International, Inc.**, Menlo Park, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/524,095**

(22) Filed: **Mar. 13, 2000**

Related U.S. Application Data

(63) Continuation-in-part of application No. 09/225,198, filed on Jan. 5, 1999.
(60) Provisional application No. 60/124,718, filed on Mar. 17, 1999, provisional application No. 60/124,720, filed on Mar. 17, 1999, and provisional application No. 60/124,719, filed on Mar. 17, 1999.

(51) **Int. Cl.**[7] **G06F 15/16**
(52) **U.S. Cl.** **709/218**; 707/5; 707/4; 707/102
(58) **Field of Search** 709/218; 707/5, 707/4, 102; 704/257, 231

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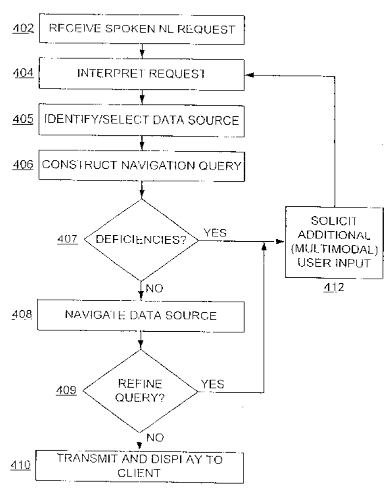
Assistant Examiner—Firmin Backer
(74) *Attorney, Agent, or Firm*—Moser, Patterson & Sheridan, LLP.; Kin-Wah Tong, Esq.

(57) **ABSTRACT**

A system, method, and article of manufacture are provided for navigating an electronic data source by means of spoken language. When a spoken input request is received from a user, it is interpreted. Additional input is solicited from the user in a modality different than the original request and used to refine the navigation query. The resulting interpretation of the request is thereupon used to automatically construct an operational navigation query to retrieve the desired information from one or more electronic network data sources.

132 Claims, 7 Drawing Sheets



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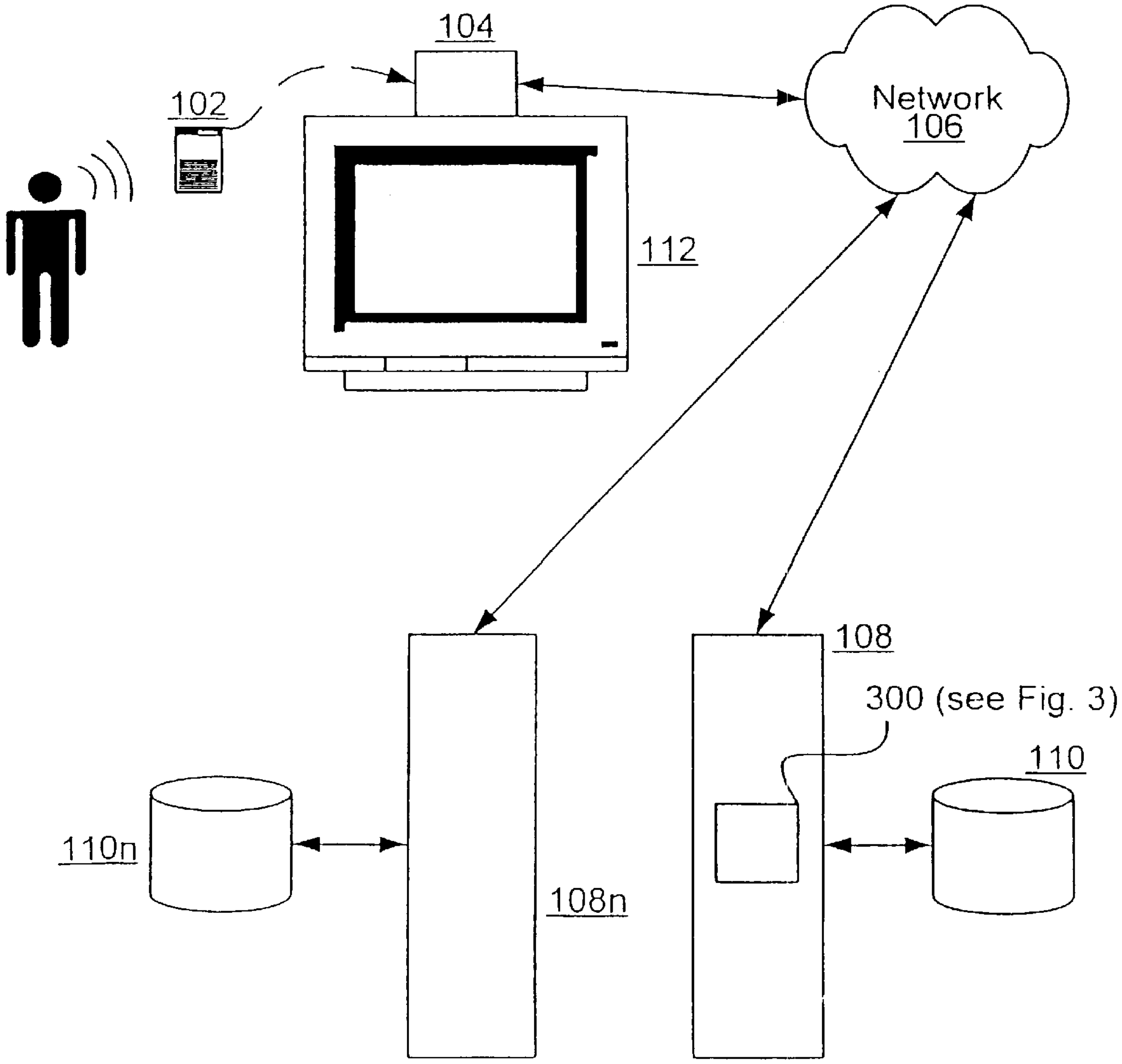


Fig. 1a

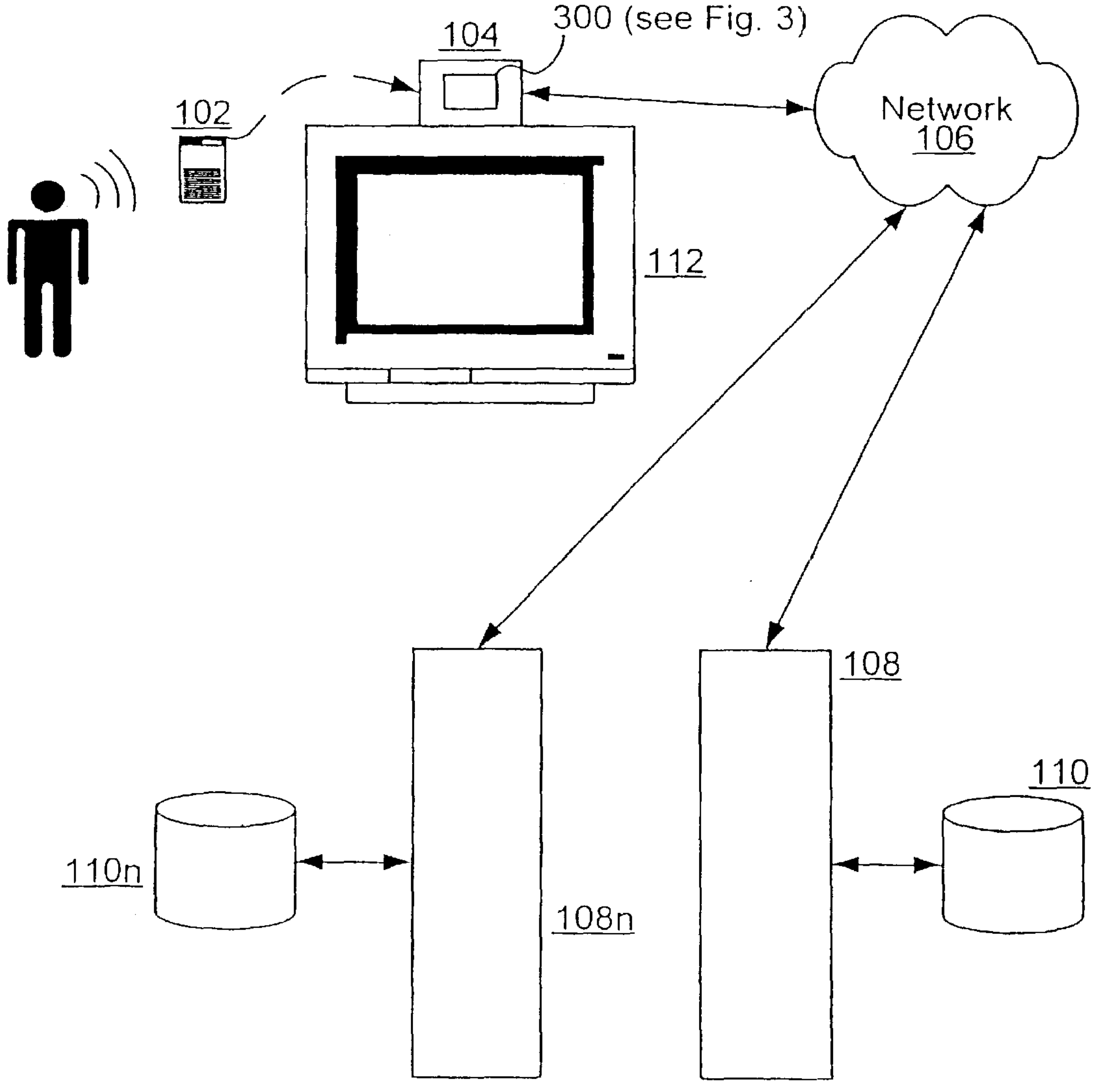


Fig. 1b

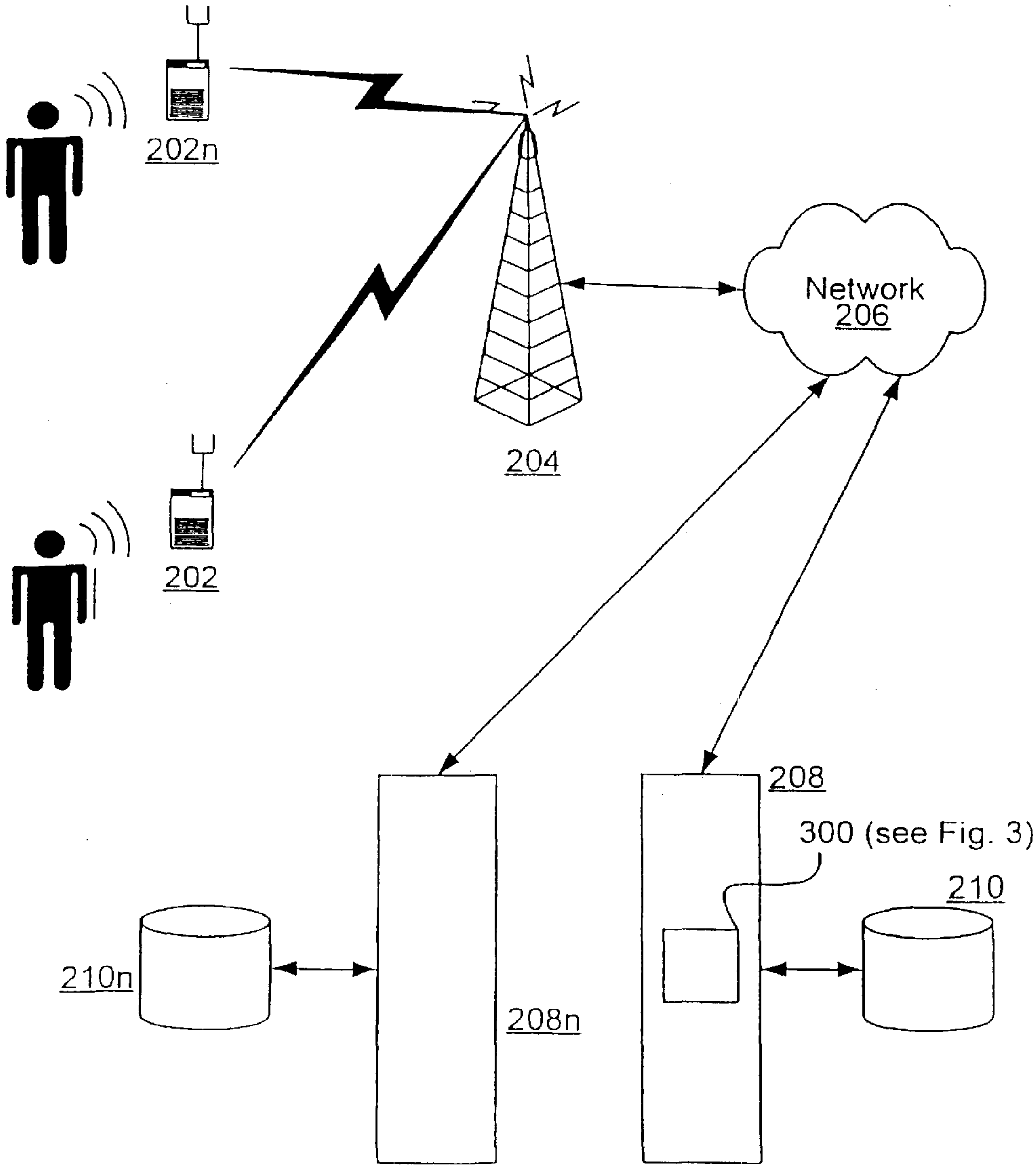


Fig. 2

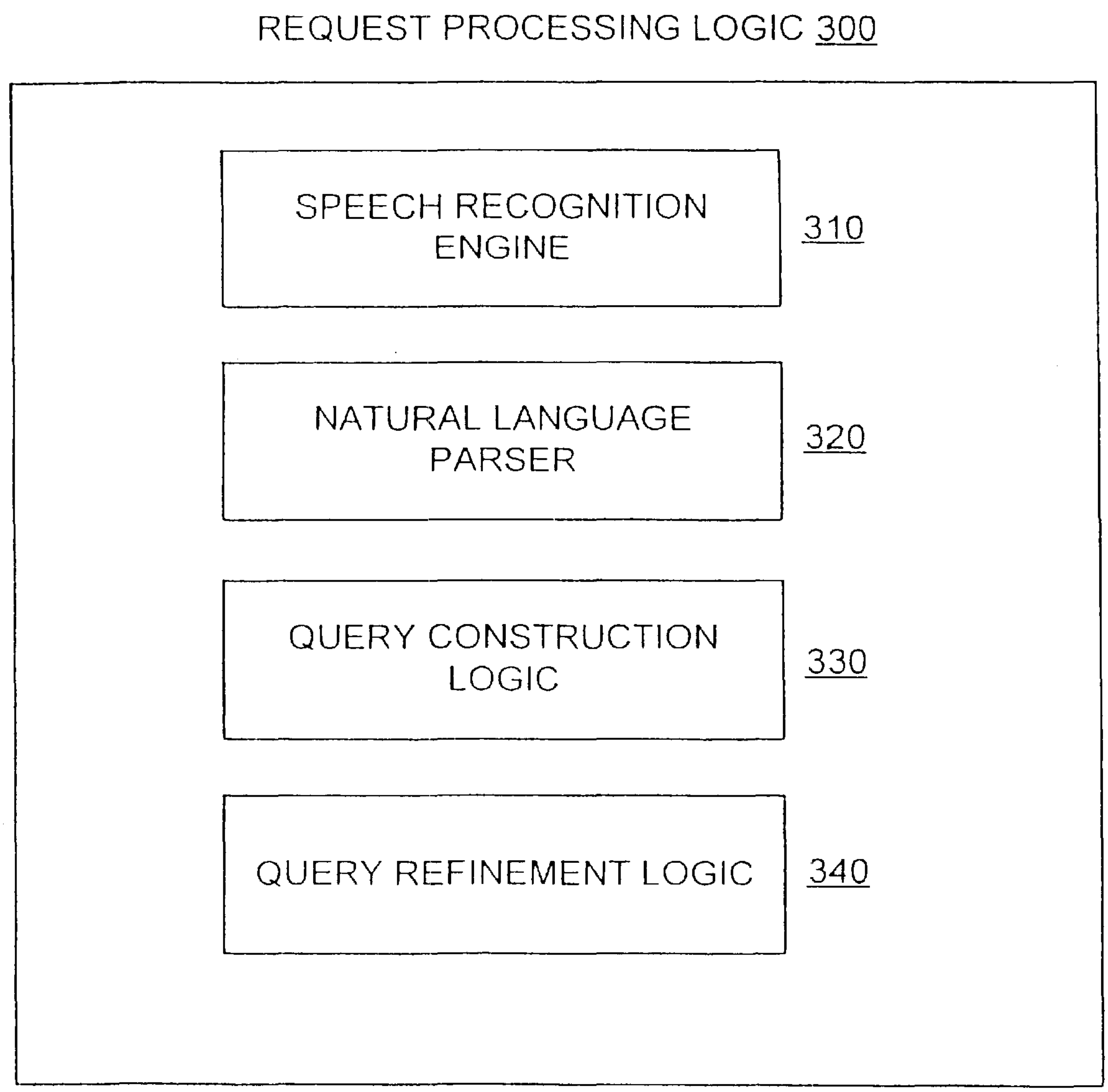

REQUEST PROCESSING LOGIC 300
SPEECH RECOGNITION ENGINE
310
NATURAL LANGUAGE PARSER
320
QUERY CONSTRUCTION LOGIC
330
QUERY REFINEMENT LOGIC
340

Fig. 3

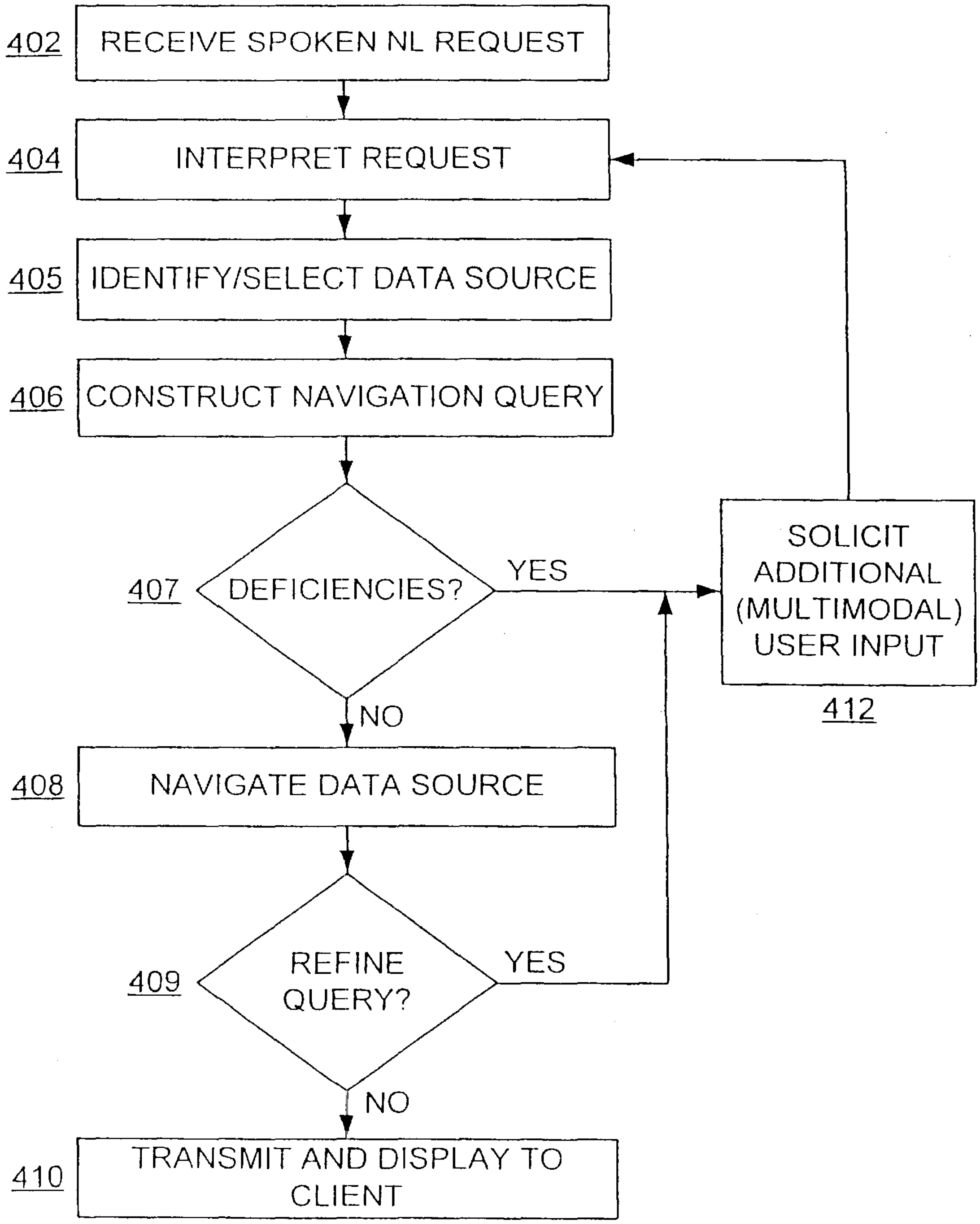

402
RECEIVE SPOKEN NL REQUEST
404
INTERPRET REQUEST
405
IDENTIFY/SELECT DATA SOURCE
406
CONSTRUCT NAVIGATION QUERY
407
DEFICIENCIES?
YES
NO
SOLICIT ADDITIONAL (MULTIMODAL) USER INPUT
412
408
NAVIGATE DATA SOURCE
409
REFINE QUERY?
YES
NO
410
TRANSMIT AND DISPLAY TO CLIENT

Fig. 4

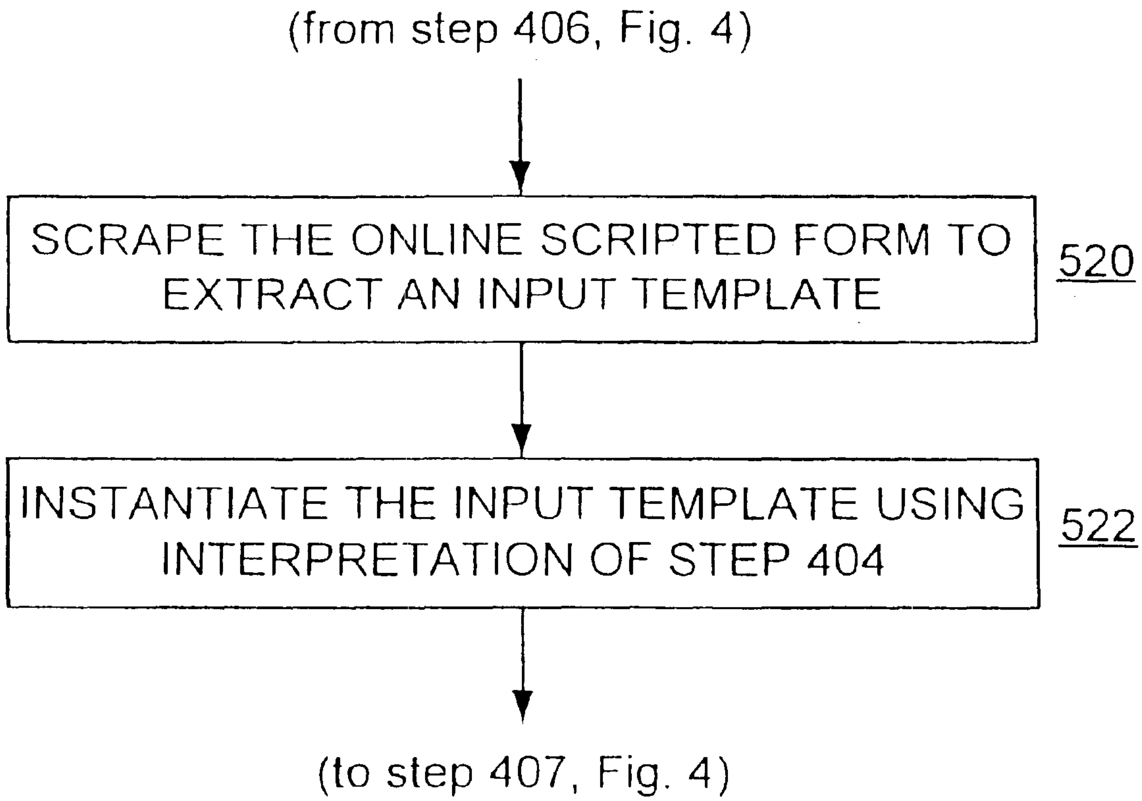
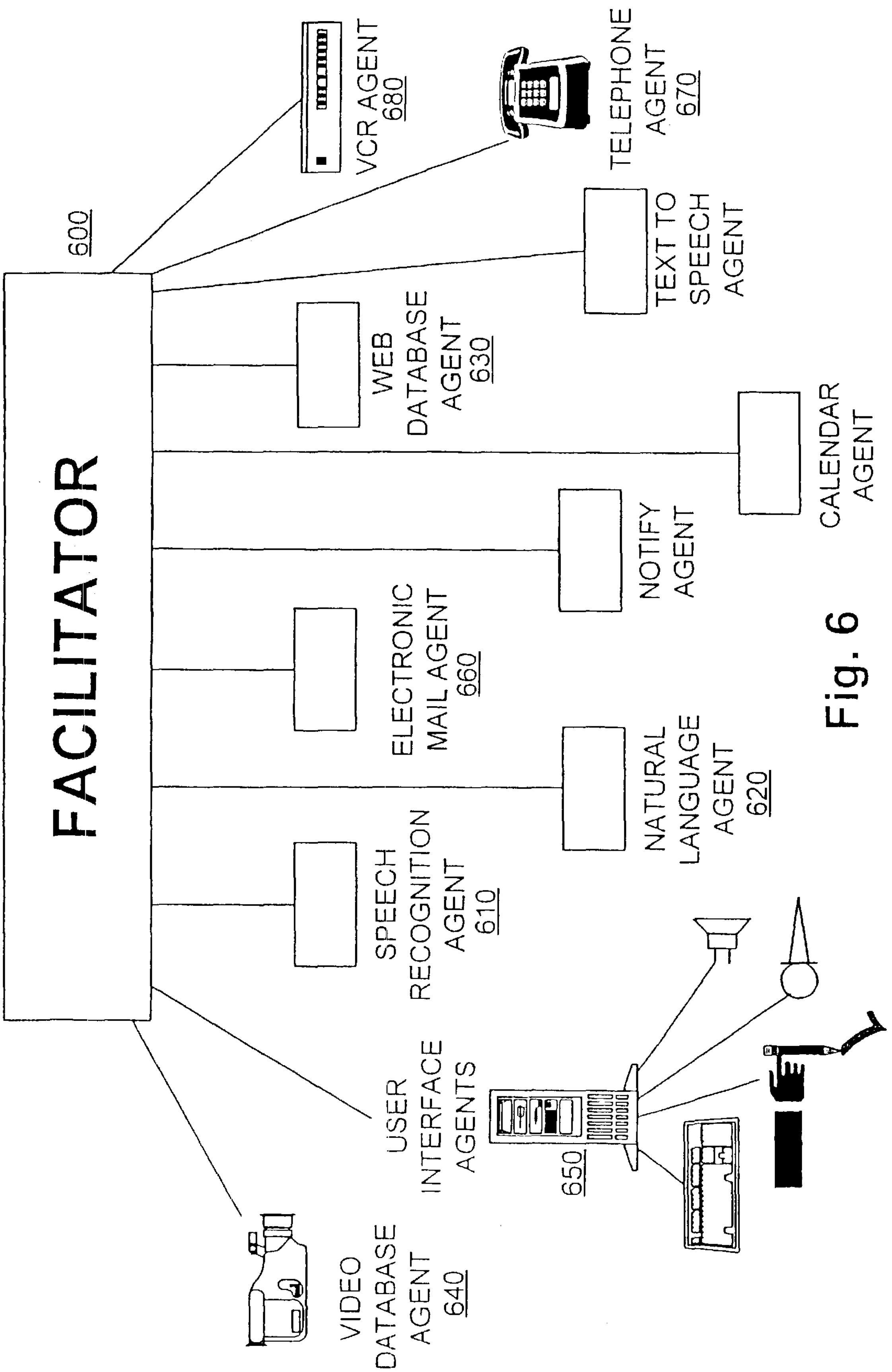

(from step 406, Fig. 4)
SCRAPE THE ONLINE SCRIPTED FORM TO EXTRACT AN INPUT TEMPLATE
520
INSTANTIATE THE INPUT TEMPLATE USING INTERPRETATION OF STEP 404
522
(to step 407, Fig. 4)

Fig. 5



FACILITATOR
600
VCR AGENT
680
TELEPHONE AGENT
670
TEXT TO SPEECH AGENT
WEB DATABASE AGENT
630
CALENDAR AGENT
NOTIFY AGENT
ELECTRONIC MAIL AGENT
660
NATURAL LANGUAGE AGENT
620
SPEECH RECOGNITION AGENT
610
USER INTERFACE AGENTS
650
VIDEO DATABASE AGENT
640

Fig. 6

NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN INPUT WITH MULTIMODAL ERROR FEEDBACK

This is a Continuation In Part of co-pending U.S. patent application Ser. No. 09/225,198, filed Jan. 5, 1999, Provisional U.S. patent application Ser. No. 60/124,718, filed Mar. 17, 1999, Provisional U.S. patent application Ser. No. 60/124,720, filed Mar. 17, 1999, and Provisional U.S. patent application Ser. No. 60/124,719, filed Mar. 17, 1999, from which applications priority is claimed and these application are incorporated herein by reference.

BACKGROUND OF THE INVENTION

The present invention relates generally to the navigation of electronic data by means of spoken natural language requests, and to feedback mechanisms and methods for resolving the errors and ambiguities that may be associated with such requests.

As global electronic connectivity continues to grow, and the universe of electronic data potentially available to users continues to expand, there is a growing need for information navigation technology that allows relatively naïve users to navigate and access desired data by means of natural language input. In many of the most important markets—including the home entertainment arena, as well as mobile computing—spoken natural language input is highly desirable, if not ideal. As just one example, the proliferation of high-bandwidth communications infrastructure for the home entertainment market (cable, satellite, broadband) enables delivery of movies-on-demand and other interactive multimedia content to the consumer's home television set. For users to take full advantage of this content stream ultimately requires interactive navigation of content databases in a manner that is too complex for user-friendly selection by means of a traditional remote-control clicker. Allowing spoken natural language requests as the input modality for rapidly searching and accessing desired content is an important objective for a successful consumer entertainment product in a context offering a dizzying range of database content choices. As further examples, this same need to drive navigation of (and transaction with) relatively complex data warehouses using spoken natural language requests applies equally to surfing the Internet/Web or other networks for general information, multimedia content, or e-commerce transactions.

In general, the existing navigational systems for browsing electronic databases and data warehouses (search engines, menus, etc.), have been designed without navigation via spoken natural language as a specific goal. So today's world is full of existing electronic data navigation systems that do not assume browsing via natural spoken commands, but rather assume text and mouse-click inputs (or in the case of TV remote controls, even less). Simply recognizing voice commands within an extremely limited vocabulary and grammar—the spoken equivalent of button/click input (e.g., speaking "channel 5" selects TV channel 5)—is really not sufficient by itself to satisfy the objectives described above. In order to deliver a true "win" for users, the voice-driven front-end must accept spoken natural language input in a manner that is intuitive to users. For example, the front-end should not require learning a highly specialized command language or format. More fundamentally, the front-end must allow users to speak directly in terms of what the user ultimately wants —e.g., "I'd like to see a Western film directed by Clint Eastwood"—as opposed to speaking in terms of arbitrary

navigation structures (e.g., hierarchical layers of menus, commands, etc.) that are essentially artifacts reflecting constraints of the pre-existing text/click navigation system. At the same time, the front-end must recognize and accommodate the reality that a stream of naive spoken natural language input will, over time, typically present a variety of errors and/or ambiguities: e.g., garbled/unrecognized words (did the user say "Eastwood" or "Easter"?) and under-constrained requests ("Show me the Clint Eastwood movie"). An approach is needed for handling and resolving such errors and ambiguities in a rapid, user-friendly, non-frustrating manner.

What is needed is a methodology and apparatus for rapidly constructing a voice-driven front-end atop an existing, non-voice data navigation system, whereby users can interact by means of intuitive natural language input not strictly conforming to the step-by-step browsing architecture of the existing navigation system, and wherein any errors or ambiguities in user input are rapidly and conveniently resolved. The solution to this need should be compatible with the constraints of a multi-user, distributed environment such as the Internet/Web or a proprietary high-bandwidth content delivery network; a solution contemplating one-at-a-time user interactions at a single location is insufficient, for example.

SUMMARY OF THE INVENTION

The present invention addresses the above needs by providing a system, method, and article of manufacture for navigating network-based electronic data sources in response to spoken input requests. When a spoken input request is received from a user, it is interpreted, such as by using a speech recognition engine to extract speech data from acoustic voice signals, and using a language parser to linguistically parse the speech data. The interpretation of the spoken request can be performed on a computing device locally with the user or remotely from the user. The resulting interpretation of the request is thereupon used to automatically construct an operational navigation query to retrieve the desired information from one or more electronic network data sources, which is then transmitted to a client device of the user. If the network data source is a database, the navigation query is constructed in the format of a database query language.

Typically, errors or ambiguities emerge in the interpretation of the spoken request, such that the system cannot instantiate a complete, valid navigational template. This is to be expected occasionally, and one preferred aspect of the invention is the ability to handle such errors and ambiguities in relatively graceful and user-friendly manner. Instead of simply rejecting such input and defaulting to traditional input modes or simply asking the user to try again, a preferred embodiment of the present invention seeks to converge rapidly toward instantiation of a valid navigational template by soliciting additional clarification from the user as necessary, either before or after a navigation of the data source, via multimodal input, i.e., by means of menu selection or other input modalities including and in addition to spoken input. This clarifying, multi-modal dialogue takes advantage of whatever partial navigational information has been gleaned from the initial interpretation of the user's spoken request. This clarification process continues until the system converges toward an adequately instantiated navigational template, which is in turn used to navigate the network-based data and retrieve the user's desired information. The retrieved information is transmitted across the network and presented to the user on a suitable client display device.

In a further aspect of the present invention, the construction of the navigation query includes extracting an input template for an online scripted interface to the data source and using the input template to construct the navigation query. The extraction of the input template can include dynamically scraping the online scripted interface.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention, together with further advantages thereof, may best be understood by reference to the following description taken in conjunction with the accompanying drawings in which:

FIG. **1***a* illustrates a system providing a spoken natural language interface for network-based information navigation, in accordance with an embodiment of the present invention with server-side processing of requests;

FIG. **1***b* illustrates another system providing a spoken natural language interface for network-based information navigation, in accordance with an embodiment of the present invention with client-side processing of requests;

FIG. **2** illustrates a system providing a spoken natural language interface for network-based information navigation, in accordance with an embodiment of the present invention for a mobile computing scenario;

FIG. **3** illustrates the functional logic components of a request processing module in accordance with an embodiment of the present invention;

FIG. **4** illustrates a process utilizing spoken natural language for navigating an electronic database in accordance with one embodiment of the present invention;

FIG. **5** illustrates a process for constructing a navigational query for accessing an online data source via an interactive, scripted (e.g., CGI) form; and

FIG. **6** illustrates an embodiment of the present invention utilizing a community of distributed, collaborating electronic agents.

DETAILED DESCRIPTION OF THE INVENTION

1. System Architecture

a. Server-End Processing of Spoken Input

FIG. **1***a* is an illustration of a data navigation system driven by spoken natural language input, in accordance with one embodiment of the present invention. As shown, a user's voice input data is captured by a voice input device **102**, such as a microphone. Preferably voice input device **102** includes a button or the like that can be pressed or held-down to activate a listening mode, so that the system need not continually pay attention to, or be confused by, irrelevant background noise. In one preferred embodiment well-suited for the home entertainment setting, voice input device **102** is a portable remote control device with an integrated microphone, and the voice data is transmitted from device **102** preferably via infrared (or other wireless) link to communications box **104** (e.g., a set-top box or a similar communications device that is capable of retransmitting the raw voice data and/or processing the voice data) local to the user's environment and coupled to communications network **106**. The voice data is then transmitted across network **106** to a remote server or servers **108**. The voice data may preferably be transmitted in compressed digitized form, or alternatively—particularly where bandwidth constraints are significant—in analog format (e.g., via frequency modulated transmission), in the latter case being digitized upon arrival at remote server **108**.

At remote server **108**, the voice data is processed by request processing logic **300** in order to understand the user's request and construct an appropriate query or request for navigation of remote data source **110**, in accordance with the interpretation process exemplified in FIG. **4** and FIG. **5** and discussed in greater detail below. For purposes of executing this process, request processing logic **300** comprises functional modules including speech recognition engine **310**, natural language (NL) parser **320**, query construction logic **330**, and query refinement logic **340**, as shown in FIG. **3**. Data source **110** may comprise database(s), Internet/web site(s), or other electronic information repositories, and preferably resides on a central server or servers—which may or may not be the same as server **108**, depending on the storage and bandwidth needs of the application and the resources available to the practitioner. Data source **110** may include multimedia content, such as movies or other digital video and audio content, other various forms of entertainment data, or other electronic information. The contents of data source **110** are navigated—i.e., the contents are accessed and searched, for retrieval of the particular information desired by the user—using the processes of FIGS. **4** and **5** as described in greater detail below.

Once the desired information has been retrieved from data source **110**, it is electronically transmitted via network **106** to the user for viewing on client display device **112**. In a preferred embodiment well-suited for the home entertainment setting, display device **112** is a television monitor or similar audiovisual entertainment device, typically in stationary position for comfortable viewing by users. In addition, in such preferred embodiment, display device **112** is coupled to or integrated with a communications box (which is preferably the same as communications box **104**, but may also be a separate unit) for receiving and decoding/formatting the desired electronic information that is received across communications network **106**.

Network **106** is a two-way electronic communications network and may be embodied in electronic communication infrastructure including coaxial (cable television) lines, DSL, fiber-optic cable, traditional copper wire (twisted pair), or any other type of hardwired connection. Network **106** may also include a wireless connection such as a satellite-based connection, cellular connection, or other type of wireless connection. Network **106** may be part of the Internet and may support TCP/IP communications, or may be embodied in a proprietary network, or in any other electronic communications network infrastructure, whether packet-switched or connection-oriented. A design consideration is that network **106** preferably provide suitable bandwidth depending upon the nature of the content anticipated for the desired application.

b. Client-End Processing of Spoken Input

FIG. **1***b* is an illustration of a data navigation system driven by spoken natural language input, in accordance with a second embodiment of the present invention. Again, a user's voice input data is captured by a voice input device **102**, such as a microphone. In the embodiment shown in FIG. **1***b*, the voice data is transmitted from device **202** to requests processing logic **300**, hosted on a local speech processor, for processing and interpretation. In the preferred embodiment illustrated in FIG. **1***b*, the local speech processor is conveniently integrated as part of communications box **104**, although implementation in a physically separate (but communicatively coupled) unit is also possible as will be readily apparent to those of skill in the art. The voice data is processed by the components of request processing logic

300 in order to understand the user's request and construct an appropriate query or request for navigation of remote data source **110**, in accordance with the interpretation process exemplified in FIGS. **4** and **5** as discussed in greater detail below.

The resulting navigational query is then transmitted electronically across network **106** to data source **110**, which preferably resides on a central server or servers **108**. As in FIG. **1***a*, data source **110** may comprise database(s), Internet/web site(s), or other electronic information repositories, and preferably may include multimedia content, such as movies or other digital video and audio content, other various forms of entertainment data, or other electronic information. The contents of data source **110** are then navigated—i.e., the contents are accessed and searched, for retrieval of the particular information desired by the user—preferably using the process of FIGS. **4** and **5** as described in greater detail below. Once the desired information has been retrieved from data source **110**, it is electronically transmitted via network **106** to the user for viewing on client display device **112**.

In one embodiment in accordance with FIG. **1***b* and well-suited for the home entertainment setting, voice input device **102** is a portable remote control device with an integrated microphone, and the voice data is transmitted from device **102** preferably via infrared (or other wireless) link to the local speech processor. The local speech processor is coupled to communications network **106**, and also preferably to client display device **112** (especially for purposes of query refinement transmissions, as discussed below in connection with FIG. **4**, step **412**), and preferably may be integrated within or coupled to communications box **104**. In addition, especially for purposes of a home entertainment application, display device **112** is preferably a television monitor or similar audiovisual entertainment device, typically in stationary position for comfortable viewing by users. In addition, in such preferred embodiment, display device **112** is coupled to a communications box (which is preferably the same as communications box **104**, but may also be a physically separate unit) for receiving and decoding/formatting the desired electronic information that is received across communications network **106**.

Design considerations favoring server-side processing and interpretation of spoken input requests, as exemplified in FIG. **1***a*, include minimizing the need to distribute costly computational hardware and software to all client users in order to perform speech and language processing. Design considerations favoring client-side processing, as exemplified in FIG. **1***b*, include minimizing the quantity of data sent upstream across the network from each client, as the speech recognition is performed before transmission across the network and only the query data and/or request needs to be sent, thus reducing the upstream bandwidth requirements.

c. Mobile Client Embodiment

A mobile computing embodiment of the present invention may be implemented by practitioners as a variation on the embodiments of either FIG. **1***a* or FIG. **1***b*. For example, as depicted in FIG. **2**, a mobile variation in accordance with the server-side processing architecture illustrated in FIG. **1** a may be implemented by replacing voice input device **102**, communications box **104**, and client display device **112**, with an integrated, mobile, information appliance **202** such as a cellular telephone or wireless personal digital assistant (wireless PDA). Mobile information appliance **202** essentially performs the functions of the replaced components. Thus, mobile information appliance **202** receives spoken natural language input requests from the user in the form of voice data, and transmits that data (preferably via wireless data receiving station **204**) across communications network **206** for server-side interpretation of the request, in similar fashion as described above in connection with FIG. **1**. Navigation of data source **210** and retrieval of desired information likewise proceeds in an analogous manner as described above. Display information transmitted electronically back to the user across network **206** is displayed for the user on the display of information appliance **202**, and audio information is output through the appliance's speakers.

Practitioners will further appreciate, in light of the above teachings, that if mobile information appliance **202** is equipped with sufficient computational processing power, then a mobile variation of the client-side architecture exemplified in FIG. **2** may similarly be implemented. In that case, the modules corresponding to request processing logic **300** would be embodied locally in the computational resources of mobile information appliance **202**, and the logical flow of data would otherwise follow in a manner analogous to that previously described in connection with FIG. **1***b*.

As illustrated in FIG. **2**, multiple users, each having their own client input device, may issue requests, simultaneously or otherwise, for navigation of data source **210**. This is equally true (though not explicitly drawn) for the embodiments depicted in FIGS. **1***a* and **1***b*. Data source **210** (or **100**), being a network accessible information resource, has typically already been constructed to support access requests from simultaneous multiple network users, as known by practitioners of ordinary skill in the art. In the case of server-side speech processing, as exemplified in FIGS. **1***a* and **2**, the interpretation logic and error correction logic modules are also preferably designed and implemented to support queuing and multi-tasking of requests from multiple simultaneous network users, as will be appreciated by those of skill in the art.

It will be apparent to those skilled in the art that additional implementations, permutations and combinations of the embodiments set forth in FIGS. **1***a*, **1***b*, and **2** may be created without straying from the scope and spirit of the present invention. For example, practitioners will understand, in light of the above teachings and design considerations, that it is possible to divide and allocate the functional components of request processing logic **300** between client and server. For example, speech recognition—in entirety, or perhaps just early stages such as feature extraction—might be performed locally on the client end, perhaps to reduce bandwidth requirements, while natural language parsing and other necessary processing might be performed upstream on the server end, so that more extensive computational power need not be distributed locally to each client. In that case, corresponding portions of request processing logic **300**, such as speech recognition engine **310** or portions thereof, would reside locally at the client as in FIG. **1***b*, while other component modules would be hosted at the server end as in FIGS. **1***a* and **2**.

Further, practitioners may choose to implement the each of the various embodiments described above on any number of different hardware and software computing platforms and environments and various combinations thereof, including, by way of just a few examples: a general-purpose hardware microprocessor such as the Intel Pentium series; operating system software such as Microsoft Windows/CE, Palm OS, or Apple Mac OS (particularly for client devices and client-side processing), or Unix, Linux, or Windows/NT (the latter three particularly for network data servers and server-side processing), and/or proprietary information access platforms such as Microsoft's WebTV or the Diva Systems video-on-demand system.

2. Processing Methodology

The present invention provides a spoken natural language interface for interrogation of remote electronic databases and retrieval of desired information. A preferred embodiment of the present invention utilizes the basic methodology outlined in the flow diagram of FIG. **4** in order to provide this interface. This methodology will now be discussed.

a. Interpreting Spoken Natural Language Requests

At step **402**, the user's spoken request for information is initially received in the form of raw (acoustic) voice data by a suitable input device, as previously discussed in connection with FIGS. **1–2**. At step **404** the voice data received from the user is interpreted in order to understand the user's request for information. Preferably this step includes performing speech recognition in order to extract words from the voice data, and further includes natural language parsing of those words in order to generate a structured linguistic representation of the user's request.

Speech recognition in step **404** is performed using speech recognition engine **310**. A variety of commercial quality, speech recognition engines are readily available on the market, as practitioners will know. For example, Nuance Communications offers a suite of speech recognition engines, including Nuance 6, its current flagship product, and Nuance Express, a lower cost package for entry-level applications. As one other example, IBM offers the ViaVoice speech recognition engine, including a low-cost shrink-wrapped version available through popular consumer distribution channels. Basically, a speech recognition engine processes acoustic voice data and attempts to generate a text stream of recognized words.

Typically, the speech recognition engine is provided with a vocabulary lexicon of likely words or phrases that the recognition engine can match against its analysis of acoustical signals, for purposes of a given application. Preferably, the lexicon is dynamically adjusted to reflect the current user context, as established by the preceding user inputs. For example, if a user is engaged in a dialogue with the system about movie selection, the recognition engine's vocabulary may preferably be adjusted to favor relevant words and phrases, such as a stored list of proper names for popular movie actors and directors, etc. Whereas if the current dialogue involves selection and viewing of a sports event, the engine's vocabulary might preferably be adjusted to favor a stored list of proper names for professional sports teams, etc. In addition, a speech recognition engine is provided with language models that help the engine predict the most likely interpretation of a given segment of acoustical voice data, in the current context of phonemes or words in which the segment appears. In addition, speech recognition engines often echo to the user, in more or less real-time, a transcription of the engine's best guess at what the user has said, giving the user an opportunity to confirm or reject.

In a further aspect of step **404**, natural language interpreter (or parser) **320** linguistically parses and interprets the textual output of the speech recognition engine. In a preferred embodiment of the present invention, the natural-language interpreter attempts to determine both the meaning of spoken words (semantic processing) as well as the grammar of the statement (syntactic processing), such as the Gemini Natural Language Understanding System developed by SRI International. The Gemini system is described in detail in publications entitled "Gemini: A Natural Language System for Spoken-Language Understanding" and "Interleaving Syntax and Semantics in an Efficient Bottom-Up Parser," both of which are currently available online at http://www.ai.sri.com/natural-language/projects/arpa-sls/nat-lang.html. (Copies of those publications are also included in an information disclosure statement submitted herewith, and are incorporated herein by this reference). Briefly, Gemini applies a set of syntactic and semantic grammar rules to a word string using a bottom-up parser to generate a logical form, which is a structured representation of the context-independent meaning of the string. Gemini can be used with a variety of grammars, including general English grammar as well as application-specific grammars. The Gemini parser is based on "unification grammar," meaning that grammatical categories incorporate features that can be assigned values; so that when grammatical category expressions are matched in the course of parsing or semantic interpretation, the information contained in the features is combined, and if the feature values are incompatible the match fails.

It is possible for some applications to achieve a significant reduction in speech recognition error by using the natural-language processing system to re-score recognition hypotheses. For example, the grammars defined for a language parser like Gemini may be compiled into context-free grammar that, in turn, can be used directly as language models for speech recognition engines like the Nuance recognizer. Further details on this methodology are provided in the publication "Combining Linguistic and Statistical Knowledge Sources in Natural-Language Processing for ATIS" which is currently available online through http://www.ai.sri.com/natural-language/projects/arpa-sls/spnl-int.html. A copy of this publication is included in an information disclosure submitted herewith, and is incorporated herein by this reference.

In an embodiment of the present invention that may be preferable for some applications, the natural language interpreter "learns" from the past usage patterns of a particular user or of groups of users. In such an embodiment, the successfully interpreted requests of users are stored, and can then be used to enhance accuracy by comparing a current request to the stored requests, thereby allowing selection of a most probable result.

b. Constructing Navigation Queries

In step **405** request processing logic **300** identifies and selects an appropriate online data source where the desired information (in this case, current weather reports for a given city) can be found. Such selection may involve look-up in a locally stored table, or possibly dynamic searching through an online search engine, or other online search techniques. For some applications, an embodiment of the present invention may be implemented in which only access to a particular data source (such as a particular vendor's proprietary content database) is supported; in that case, step **405** may be trivial or may be eliminated entirely.

Step **406** attempts to construct a navigation query, reflecting the interpretation of step **404**. This operation is preferably performed by query construction logic **330**.

A "navigation query" means an electronic query, form, series of menu selections, or the like; being structured appropriately so as to navigate a particular data source of interest in search of desired information. In other words, a navigation query is constructed such that it includes whatever content and structure is required in order to access desired information electronically from a particular database or data source of interest.

For example, for many existing electronic databases, a navigation query can be embodied using a formal database query language such as Standard Query Language (SQL). For many databases, a navigation query can be constructed through a more user-friendly interactive front-end, such as a series of menus and/or interactive forms to be selected or filled in. SQL is a standard interactive and programming language for getting information from and updating a database. SQL is both an ANSI and an ISO standard. As is well known to practitioners, a Relational Database Management System (RDBMS), such as Microsoft's Access, Oracle's Oracle7, and Computer Associates' CA-OpenIngres, allow programmers to create, update, and administer a relational database. Practitioners of ordinary skill in the art will be thoroughly familiar with the notion of database navigation through structured query, and will be readily able to appreciate and utilize the existing data structures and navigational mechanisms for a given database, or to create such structures and mechanisms where desired.

In accordance with the present invention, the query constructed in step **406** must reflect the user's request as interpreted by the speech recognition engine and the NL parser in step **404**. In embodiments of the present invention wherein data source **110** (or **210** in the corresponding embodiment of FIG. **2**) is a structured relational database or the like, step **406** of the present invention may entail constructing an appropriate Structured Query Language (SQL) query or the like, or automatically filling out a front-end query form, series of menus or the like, as described above.

In many existing Internet (and Intranet) applications, an online electronic data source is accessible to users only through the medium of interaction with a so-called Common Gateway Interface (CGI) script. Typically the user who visits a web site of this nature must fill in the fields of an online interactive form. The online form is in turn linked to a CGI script, which transparently handles actual navigation of the associated data source and produces output for viewing by the user's web browser. In other words, direct user access to the data source is not supported, only mediated access through the form and CGI script is offered.

For applications of this nature, an advantageous embodiment of the present invention "scrapes" the scripted online site where information desired by a user may be found in order to facilitate construction of an effective navigation query. For example, suppose that a user's spoken natural language request is: "What's the weather in Miami?" After this request is received at step **402** and interpreted at step **404**, assume that step **405** determines that the desired weather information is available online through the medium of a CGI-scripted interactive form. Step **406** is then preferably carried out using the expanded process diagrammed in FIG. **5**. In particular, at sub-step **520**, query construction logic **330** electronically "scrapes" the online interactive form, meaning that query construction logic **330** automatically extracts the format and structure of input fields accepted by the online form. At sub-step **522**, a navigation query is then constructed by instantiating (filling in) the extracted input format—essentially an electronic template—in a manner reflecting the user's request for information as interpreted in step **404**. The flow of control then returns to step **407** of FIG. **4**. Ultimately, when the query thus constructed by scraping is used to navigate the online data source in step **408**, the query effectively initiates the same scripted response as if a human user had visited the online site and had typed appropriate entries into the input fields of the online form.

In the embodiment just described, scraping step **520** is preferably carried out with the assistance of an online extraction utility such as WebL. WebL is a scripting language for automating tasks on the World Wide Web. It is an imperative, interpreted language that has built-in support for common web protocols like HTTP and FTP, and popular data types like HTML and XML. WebL's implementation language is Java, and the complete source code is available from Compaq. In addition, step **520** is preferably performed dynamically when necessary—in other words, on-the-fly in response to a particular user query—but in some applications it may be possible to scrape relatively stable (unchanging) web sites of likely interest in advance and to cache the resulting template information.

It will be apparent, in light of the above teachings, that preferred embodiments of the present invention can provide a spoken natural language interface atop an existing, non-voice data navigation system, whereby users can interact by means of intuitive natural language input not strictly conforming to the linear browsing architecture or other artifacts of an existing menu/text/click navigation system. For example, users of an appropriate embodiment of the present invention for a video-on-demand application can directly speak the natural request: "Show me the movie 'Unforgiven'"—instead of walking step-by-step through a typically linear sequence of genre/title/actor/director menus, scrolling and selecting from potentially long lists on each menu, or instead of being forced to use an alphanumeric keyboard that cannot be as comfortable to hold or use as a lightweight remote control. Similarly, users of an appropriate embodiment of the present invention for a web-surfing application in accordance with the process shown in FIG. **5** can directly speak the natural request: "Show me a one-month price chart for Microsoft stock"—instead of potentially having to navigate to an appropriate web site, search for the right ticker symbol, enter/select the symbol, and specify display of the desired one-month price chart, each of those steps potentially involving manual navigation and data entry to one or more different interaction screens. (Note that these examples are offered to illustrate some of the potential benefits offered by appropriate embodiments of the present invention, and not to limit the scope of the invention in any respect.)

c. Error Correction

Several problems can arise when attempting to perform searches based on spoken natural language input. As indicated at decision step **407** in the process of FIG. **4**, certain deficiencies may be identified during the process of query construction, before search of the data source is even attempted. For example, the user's request may fail to specify enough information in order to construct a navigation query that is specific enough to obtain a satisfactory search result. For example, a user might orally request "what's the weather?" whereas the national online data source identified in step **405** and scraped in step **520** might require specifying a particular city.

Additionally, certain deficiencies and problems may arise following the navigational search of the data source at step **408**, as indicated at decision step **409** in FIG. **4**. For example, with reference to a video-on-demand application, a user may wish to see the movie "Unforgiven", but perhaps the user can't recall name of the film, but knows it was directed by and starred actor Clint Eastwood. A typical video-on-demand database might indeed be expected to allow queries specifying the name of a leading actor and/or director, but in the case of this query—as in many cases—that will not be enough to narrow the search to a single film, and additional user input in some form is required.

In the event that one or more deficiencies in the user's spoken request, as processed, result in the problems described, either at step **407** or **409**, some form of error handling is in order. A straightforward, crude technique might be for the system to respond simply "input not understood/insufficient; please try again." However, that approach will likely result in frustrated users, and is not optimal or even acceptable for most applications. Instead, a preferred technique in accordance with the present invention handles such errors and deficiencies in user input at step **412**, whether detected at step **407** or step **409**, by soliciting additional input from the user in a manner taking advantage of the partial construction already performed and via user interface modalities in addition to spoken natural language ("multi-modality"). This supplemental interaction is preferably conducted through client display device **112** (**202**, in the embodiment of FIG. **2**), and may include textual, graphical, audio and/or video media. Further details and examples are provided below. Query refinement logic **340** preferably carries out step **412**. The additional input received from the user is fed into and augments interpreting step **404**, and query construction step **406** is likewise repeated with the benefit of the augmented interpretation. These operations, and subsequent navigation step **408**, are preferably repeated until no remaining problems or deficiencies are identified at decision points **407** or **409**. Further details and examples for this query refinement process are provided immediately below.

Consider again the example in which the user of a video-on-demand application wishes to see "Unforgiven" but can only recall that it was directed by and starred Clint Eastwood. First, it bears noting that using a prior art navigational interface, such as a conventional menu interface, will likely be relatively tedious in this case. The user can proceed through a sequence of menus, such as Genre (select "western"), Title (skip), Actor ("Clint Eastwood"), and Director ("Clint Eastwood"). In each case—especially for the last two items—the user would typically scroll and select from fairly long lists in order to enter his or her desired name, or perhaps use a relatively couch-unfriendly keypad to manually type the actor's name twice.

Using a preferred embodiment of the present invention, the user instead speaks aloud, holding remote control microphone **102**, "I want to see that movie starring and directed by Clint Eastwood. Can't remember the title." At step **402** the voice data is received. At step **404** the voice data is interpreted. At step **405** an appropriate online data source is selected (or perhaps the system is directly connected to a proprietary video-on-demand provider). At step **406** a query is automatically constructed by the query construction logic **330** specifying "Clint Eastwood" in both the actor and director fields. Step **407** detects no obvious problems, and so the query is electronically submitted and the data source is navigated at step **408**, yielding a list of several records satisfying the query (e.g., "Unforgiven", "True Crime", "Absolute Power", etc.). Step **409** detects that additional user input is needed to further refine the query in order to select a particular film for viewing.

At that point, in step **412** query refinement logic **340** might preferably generate a display for client display device **112** showing the (relatively short) list of film titles that satisfy the user's stated constraints. The user can then preferably use a relatively convenient input modality, such as buttons on the remote control, to select the desired title from the menu. In a further preferred embodiment, the first title on the list is highlighted by default, so that the user can simply press an "OK" button to choose that selection. In a further preferred feature, the user can mix input modalities by speaking a response like "I want number one on the list." Alternatively, the user can preferably say, "Let's see Unforgiven," having now been reminded of the title by the menu display.

Utilizing the user's supplemental input, request processing logic **300** iterates again through steps **404** and **406**, this time constructing a fully-specified query that specifically requests the Eastwood film "Unforgiven." Step **408** navigates the data source using that query and retrieves the desired film, which is then electronically transmitted in step **410** from network server **108** to client display device **112** via communications network **106**.

Now consider again the example in which the user of a web surfing application wants to know his or her local weather, and simply asks, "what's the weather?" At step **402** the voice data is received. At step **404** the voice data is interpreted. At step **405** an online web site providing current weather information for major cities around the world is selected. At step **406** and sub-step **520**, the online site is scraped using a WebL-style tool to extract an input template for interacting with the site. At sub-step **522**, query construction logic **330** attempts to construct a navigation query by instantiating the input template, but determines (quite rightly) that a required field—name of city—cannot be determined from the user's spoken request as interpreted in step **404**. Step **407** detects this deficiency, and in step **412** query refinement logic **340** preferably generates output for client display device **112** soliciting the necessary supplemental input. In a preferred embodiment, the output might display the name of the city where the user is located highlighted by default. The user can then simply press an "OK" button—or perhaps mix modalities by saying "yes, exactly"—to choose that selection. A preferred embodiment would further display an alphabetical scrollable menu listing other major cities, and/or invite the user to speak or select the name of the desired city.

Here again, utilizing the user's supplemental input, request processing logic **300** iterates through steps **404** and **406**. This time, in performing sub-step **520**, a cached version of the input template already scraped in the previous iteration might preferably be retrieved. In sub-step **522**, query construction logic **330** succeeds this time in instantiating the input template and constructing an effective query, since the desired city has now been clarified. Step **408** navigates the data source using that query and retrieves the desired weather information, which is then electronically transmitted in step **410** from network server **108** to client display device **112** via communications network **106**.

It is worth noting that in some instances, there may be details that are not explicitly provided by the user, but that query construction logic **330** or query refinement logic **340** may preferably deduce on their own through reasonable assumptions, rather than requiring the use to provide explicit clarification. For example, in the example previously described regarding a request for a weather report, in some applications it might be preferable for the system to simply assume that the user means a weather report for his or her home area and to retrieve that information, if the cost of doing so is not significantly greater than the cost of asking the user to clarify the query. Making such an assumption might be even more strongly justified in a preferred embodiment, as described earlier, where user histories are tracked, and where such history indicates that a particular user or group of users typically expect local information when asking for a weather forecast. At any rate, in the event such an assumption is made, if the user actually intended to request the weather for a different city, the user would then need to ask his or her question again. It will be apparent to practitioners, in light of the above teachings, that the choice of whether to program query construction logic **330** and query refinement logic **340** to make particular assumptions will typically involve trade-offs involving user convenience that can be assessed in the context of specific applications.

3. Open Agent Architecture (OAA®)

Open Agent Architecture™ (OAA®) is a software platform, developed by the assignee of the present invention, that enables effective, dynamic collaboration among communities of distributed electronic agents. OAA is described in greater detail in co-pending U.S. patent application Ser. No. 09/225,198, which has been incorporated herein by reference. Very briefly, the functionality of each client agent is made available to the agent community through registration of the client agent's capabilities with a facilitator. A software "wrapper" essentially surrounds the underlying application program performing the services offered by each client. The common infrastructure for constructing agents is preferably supplied by an agent library. The agent library is preferably accessible in the runtime environment of several different programming languages. The agent library preferably minimizes the effort required to construct a new system and maximizes the ease with which legacy systems can be "wrapped" and made compatible with the agent-based architecture of the present invention. When invoked, a client agent makes a connection to a facilitator, which is known as its parent facilitator. Upon connection, an agent registers with its parent facilitator a specification of the capabilities and services it can provide, using a highlevel, declarative Interagent Communication Language ("ICL") to express those capabilities. Tasks are presented to the facilitator in the form of ICL goal expressions. When a facilitator determines that the registered capabilities of one of its client agents will help satisfy a current goal or sub-goal thereof, the facilitator delegates that subgoal to the client agent in the form of an ICL request. The client agent processes the request and returns answers or information to the facilitator. In processing a request, the client agent can use ICL to request services of other agents, or utilize other infrastructure services for collaborative work. The facilitator coordinates and integrates the results received from different client agents on various sub-goals, in order to satisfy the overall goal.

OAA provides a useful software platform for building systems that integrate spoken natural language as well as other user input modalities. For example, see the above-referenced co-pending patent application, especially FIG. **13** and the corresponding discussion of a "multi-modal maps" application, and FIG. **12** and the corresponding discussion of a "unified messaging" application. Another example is the InfoWiz interactive information kiosk developed by the assignee and described in the document entitled "InfoWiz: An Animated Voice Interactive Information System" available online at http://www.ai.sri.com/~oaa/applications.html. A copy of the InfoWhiz document is provided in an Information Disclosure Statement submitted herewith and incorporated herein by this reference. A further example is the "CommandTalk" application developed by the assignee for the U.S. military, as described online at http://www.ai.sri.com/~lesaf/commandtalk.html and in the following publications, copies of which are provided in an Information Disclosure Statement submitted herewith and incorporated herein by this reference:

"CommandTalk: A Spoken-Language Interface for Battlefield Simulations", 1997, by Robert Moore, John Dowding, Harry Bratt, J. Mark Gawron, Yonael Gorfu and Adam Cheyer, in "Proceedings of the Fifth Conference on Applied Natural Language Processing", Washington, DC, pp. 1–7, Association for Computational Linguistics

"The CommandTalk Spoken Dialogue System", 1999, by Amanda Stent, John Dowding, Jean Mark Gawron, Elizabeth Owen Bratt and Robert Moore, in "Proceedings of the Thirty-Seventh Annual Meeting of the ACL", pp. 183–190, University of Maryland, College Park, Md., Association for Computational Linguistics

"Interpreting Language in Context in CommandTalk", 1999, by John Dowding and Elizabeth Owen Bratt and Sharon Goldwater, in "Communicative Agents: The Use of Natural Language in Embodied Systems", pp. 63–67, Association for Computing Machinery (ACM) Special Interest Group on Artificial Intelligence (SIGART), Seattle, Wash.

For some applications and systems, OAA can provide an advantageous platform for constructing embodiments of the present invention. For example, a representative application is now briefly presented, with reference to FIG. **6**. If the statement "show me movies starring John Wayne" is spoken into the voice input device, the voice data for this request will be sent by UI agent **650** to facilitator **600**, which in turn will ask natural language (NL) agent **620** and speech recognition agent **610** to interpret the query and return the interpretation in ICL format. The resulting ICL goal expression is then routed by the facilitator to appropriate agents—in this case, video-on-demand database agent **640**—to execute the request. Video database agent **640** preferably includes or is coupled to an appropriate embodiment of query construction logic **330** and query refinement logic **340**, and may also issue ICL requests to facilitator **600** for additional assistance—e.g., display of menus and capture of additional user input in the event that query refinement is needed—and facilitator **600** will delegate such requests to appropriate client agents in the community. When the desired video content is ultimately retrieved by video database agent **640**, UI agent **650** is invoked by facilitator **600** to display the movie.

Other spoken user requests, such as a request for the current weather in New York City or for a stock quote, would eventually lead facilitator to invoke web database agent **630** to access the desired information from an appropriate Internet site. Here again, web database agent **630** preferably includes or is coupled to an appropriate embodiment of query construction logic **330** and query refinement logic **340**, including a scraping utility such as WebL. Other spoken requests, such as a request to view recent emails or access voice mail, would lead the facilitator to invoke the appropriate email agent **660** and/or telephone agent **680**. A request to record a televised program of interest might lead facilitator **600** to invoke web database agent **630** to return televised program schedule information, and then invoke VCR controller agent **680** to program the associated VCR unit to record the desired television program at the scheduled time.

Control and connectivity embracing additional electronic home appliances (e.g., microwave oven, home surveillance system, etc.) can be integrated in comparable fashion. Indeed, an advantage of OAA-based embodiments of the present invention, that will be apparent to practitioners in light of the above teachings and in light of the teachings disclosed in the cited co-pending patent applications, is the relative ease and flexibility with which additional service agents can be plugged into the existing platform, immediately enabling the facilitator to respond dynamically to spoken natural language requests for the corresponding services.

4. Further Embodiments and Equivalents

While the present invention has been described in terms of several preferred embodiments, there are many alterations, permutations, and equivalents that may fall within the scope of this invention. It should also be noted that there are many alternative ways of implementing the methods and apparatuses of the present invention. It is therefore intended that the following appended claims be interpreted as including all such alterations, permutations, and equivalents as fall within the true spirit and scope of the present invention.

What is claimed is:

1. A method for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising the steps of:

(a) receiving a spoken request for desired information from the user;

(b) rendering an interpretation of the spoken request;

(c) constructing at least part of a navigation query based upon the interpretation;

(d) soliciting additional input from the user, including user interaction in a non-spoken modality different than the original request without requiring the user to request said non-spoken modality;

(e) refining the navigation query, based upon the additional input;

(f) using the refined navigation query to select a portion of the electronic data source; and

(g) transmitting the selected portion of the electronic data source from the network server to a client device of the user.

2. The method of claim **1**, wherein the step of rendering an interpretation further includes deriving linguistic information by using a speech recognition engine and a linguistic parser.

3.The method of claim **1**, wherein the step of constructing a navigation query further includes the steps of extracting an input template for an online scripted interface to the data source, and using the input template to construct the navigation query.

4. The method of claim **3**, wherein the step of extracting the input template includes dynamically scraping the online scripted interface.

5. The method of claim **1**, wherein the navigation query is constructed in the format of a database query language.

6. The method of claim **1**, wherein the step of rendering an interpretation and the step of constructing a navigation query are performed, at least in part, on a computing device located locally with the user.

7. The method of claim **1**, wherein the step of rendering an interpretation and the step of constructing a navigation query are performed, at least in part, on a network computing device located remotely from the user.

8. The method of claim **1**, wherein the step of soliciting additional input is performed in response to one or more deficiencies encountered during the step of constructing a navigation query.

9. The method of claim **8**, wherein the deficiencies include unresolved words of the spoken request.

10. The method of claim **8**, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken request.

11.The method of claim **1**, wherein the step of soliciting additional input is performed in response to one or more deficiencies encountered after a first navigation of the data source using the navigation query constructed in step (c).

12. The method of claim **11**, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

13. The method of claim **11**, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

14. The method of claim **1**, wherein the additional input is solicited upon receiving a user-input statement that additional information is required.

15. The method of claim **1**, wherein the step of soliciting the additional input includes presenting a menu to the user on the client device of the user.

16. The method of claim **1**, wherein the step of soliciting the additional input includes presenting a textual request for the additional input.

17. The method of claim **1**, wherein the step of soliciting the additional input includes an audible request for the additional input.

18. The method of claim **1**, wherein the step of soliciting the additional input includes presenting a list of portions of the electronic data source that match the navigational query.

19. The method of claim **1**, wherein additional input received from the user is at least partially speech based.

20. The method of claim **1**, wherein additional input received from the user includes no spoken input.

21. The method of claim **1**, wherein steps (d)–(e) are repeated until the navigational query is deemed adequate.

22. The method of claim **1**, wherein the input modality of step (d) includes selecting from a displayed option menu.

23. The method of claim **22**, wherein the act of selecting from the displayed option menu is performed by speaking.

24. The method of claim **1**, wherein the method is performed with respect to a plurality of simultaneous users and corresponding client devices.

25. The method of claim **1**, further including the step of selecting the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken request.

26. The method of claim **1**, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

27. A system for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, the system comprising:

(a) a portable microphone operable to receive a spoken request for desired information from the user;

(b) language processing logic, operable to render an interpretation of the spoken request;

(c) query construction logic, operable to construct a navigation query in response to the interpretation of the spoken request;

(d) user interaction logic, operable to solicit additional input from the user, including user interaction in a non-spoken modality different than the original request without requiring the user to request said non-spoken modality;

(e) query refining logic, operable to refine the navigation query, based upon the additional input;

(f) navigation logic, operable to select a portion of the electronic data source using the navigation query; and

(g) electronic communications infrastructure for transmitting the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user.

28. The system of claim **27**, wherein the language processing logic includes speech recognition logic and an linguistic parsing logic for deriving linguistic information.

29. The system of claim **27**, wherein the language processing logic extracts an input template for an online scripted interface to the data source, and uses the input template to construct the navigation query.

30. The system of claim **29**, wherein the language processing logic dynamically scrapes the online scripted interface.

31. The system of claim **27**, wherein the query construction logic constructs the query in the format of a database query language.

32. The system of claim **27**, wherein at least a portion of the language processing logic is hosted on a computing device located locally with the user, and wherein the portable microphone is electronically coupled to the local computing device.

33. The system of claim **27**, wherein at least a portion of the language processing logic is hosted on a network computing device located remotely from the user, and wherein the portable microphone sends data to the remote network computing device via the communications infrastructure.

34. The system of claim **27**, wherein the user interaction logic solicits additional input in response to one or more deficiencies encountered during construction of the navigation query.

35. The system of claim **34**, wherein the deficiencies include unresolved words of the spoken request.

36. The system of claim **34**, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken request.

37. The system of claim **27**, wherein the user interaction logic solicits additional input in response to one or more deficiencies encountered after a first navigation of the data source performed by the navigation logic.

38. The system of claim **31**, wherein the deficiencies include existence of more than one date record within the data source responsive to the navigation query.

39. The system of claim **31**, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

40. The system of claim **27**, wherein the user Interaction logic displays an option menu.

41. The system of claim **40**, wherein the act of selecting from the displayed option menu is performed by speaking.

42. The system of claim **27**, wherein the navigation logic selects the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken request.

43. The system of claim **27**, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

44. The system of claim **27**, wherein the display device receives data from the electronic data source on the network servers via a communications box.

45. The system of claim **27**, wherein the electronic communication infrastructure is a two-way infrastructure and is selected from among one or more of the following group: {coaxial cable, DSL, satellite, wireless/cellular, fiber-optic}.

46. A computer program embodied on a computer readable medium for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising:

(a) a code segment that receives a spoken request for desired information from the user;

(b) a code segment that renders an interpretation of the spoken request;

(c) a code segment that constructs at least part of a navigation query based upon the interpretation;

(d) a code segment that solicits additional input from the user, including user interaction in a non-spoken modality different than the original request without requiring the user to request said non-spoken modality;

(e) a code segment that refines the navigation query, based upon the additional input;

(f) a code segment that uses the refined navigation query to select a portion of the electronic data source; and

(g) a code segment that transmits the selected portions of the electronic data source from the network server to a primarily stationary, display device located locally with the user.

47. The computer program of claim **46**, further comprising a code segment that derives linguistic information by using a speech recognition engine and a linguistic parser.

48. The computer program of claim **46**, further comprising a code segment that extract an input template for an online scripted interface to the data source, and a code segment that uses the input template to construct the navigation query.

49. The computer program of claim **48**, further comprising a code segment that dynamically scrapes the online scripted interface.

50. The computer program of claim **46**, wherein the navigation query is constructed in the format of a database query language.

51. The computer program of claim **46**, wherein rendering of the interpretation and the construction of the navigation query are performed, at least in part, on a computing device located locally with the user.

52. The compute program of claim **46**, wherein the rendering of the interpretation and the construction of a navigation query are performed, at least in part, on a network computing device located remotely from the user.

53. The computer program of claim **46**, wherein code segment that solicits additional input solicits the additional input in response to one or more deficiencies encountered during the constructing of the navigation query.

54. The computer program of claim **53**, wherein the deficiencies include unresolved words of the spoken request.

55. The computer program of claim **53**, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken request.

56. The computer program of claim **46**, wherein the code segment that solicits the additional input solicits the additional input in response to one or more deficiencies encountered after a first navigation of the data source.

57. The computer program of claim **56**, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

58. The computer program of claim **57**, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

59. The computer program of claim **46**, wherein code segment that solicits additional Input displays an option menu.

60. The computer program of claim **59**, wherein the act of selecting from the displayed option menu is performed by speaking.

61. The computer program of claim **46**, wherein the code segments of the computer program operate with respect to a plurality of simultaneous users and corresponding client devices.

62. The computer program of claim **46**, further comprising a code segment that selects the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken request.

63. The computer program of claim **46**, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

64. The computer program of claim **46**, wherein the additional input is solicited upon receiving a user-input statement that additional information is required.

65. The computer program of claim **46**, wherein the code segment that solicits the additional input includes a code segment that presents a menu to the user on the client device of the user.

66. The computer program of claim **46**, wherein the code segment that solicits the additional input includes a code segment that presents a textual request for the additional input.

67. The computer program of claim **46**, wherein the code segment that solicits the additional input includes a code segment that produces an audible request for the additional input.

68. The computer program of claim **46**, wherein the code segment that solicits the additional input includes a code segment that presents a list of portions of the electronic data source that match the navigational query.

69. The computer program of claim **46**, wherein additional input received from the user is at least partially speech based.

70. The computer program of claim **46**, wherein additional input received from the user includes no spoken input.

71. The compute program of claim **46**, wherein code segments (d)–(e) are repeated until the navigational query is deemed adequate.

72. A method for utilizing spoken natural language for navigating an electronic data source, the electronic data source being located at one or more network servers located remotely from a user; comprising the steps of:

(a) receiving a spoken natural language ("NL") request for desired information from the user;

(b) rendering an interpretation of the spoken request;

(c) constructing at least part of a navigation query based upon the interpretation;

(d) soliciting additional input from the user, including user interaction in a non-spoken modality different than the original request without requiring the user to request said non-spoken modality;

(e) refining the navigation query, based upon the additional input;

(f) using the refined navigation query to select a portion of the electronic data source; and

(g) transmitting the selected portion of the electronic data source from the network server to a client device,of the user.

73. The method of claim **72**, wherein the step of rendering an interpretation further includes deriving linguistic information by using a speech recognition engine and an NL parser.

74. The method of claim **72**, wherein the step of constructing a navigation query further includes the steps of extracting an input template for an online scripted interface to the data source, and using the input template to construct the navigation query.

75. The method of claim **74**, wherein the step of extracting an input template includes dynamically scraping the online scripted interface.

76. The method of claim **72**, wherein the navigation query is constructed in the format of a database query language.

77. The method of claim **72**, wherein the step of rendering an interpretation and the step of constructing a navigation query are performed, at least in part, on a computing device located locally with the user.

78. The method of claim **72**, wherein the step of rendering an interpretation and the step of constructing a navigation query are performed, at least in part, on a network computing device located remotely from the user.

79. The method of claim **72**, wherein the step of soliciting additional input is performed in response to one or more deficiencies encountered during the step of constructing a navigation query.

80. The method of claim **79**, wherein the deficiencies include unresolved words of the spoken NL request.

81. The method of claim **79**, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken NL request.

82. The method of claim **72**, wherein the step of soliciting additional input is performed in response to one or more deficiencies encountered after a first navigation of the data source using the navigation query constructed in step (c).

83. The method of claim **82**, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

84. The method of claim **82**, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

85. The method of claim **72**, wherein the input modality of step (d) includes selecting from a displayed option menu.

86. The method of claim **85**, wherein the act of selecting from the displayed option menu is performed by speaking.

87. The method of claim **72**, wherein the method is performed with respect to a plurality of simultaneous users and corresponding client devices.

88. The method of claim **72**, further including the step of selecting the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken NL request.

89. The method of claim **72**, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

90. A system or utilizing spoken natural language to navigate an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, the system comprising:

(a) a portable microphone operable to receive a spoken natural language ("NL") request for desired information from the user;

(b) spoken language processing logic, operable to render an interpretation of the spoken natural language request;

(c) query construction logic, operable to construct a navigation query in response to the interpretation of the spoken natural language request;

(d) user interaction logic, operable to solicit additional input from the user, including user interaction in a non-spoken modality different than the original request without requiring the user to request said non-spoken modality;

(e) query refining logic, operable to refine the navigation query, based upon the additional input;

(f) navigation logic, operable to select a portion of the electronic data source using the navigation query; and

(g) electronic communications infrastructure for transmitting the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user.

91. The system of claim **90**, wherein the spoken language processing logic includes speech recognition logic and an NL parsing logic for deriving linguistic information.

92. The system of claim **90**, wherein the spoken language processing logic extracts an input template for an online scripted interface to the data source, and uses the input template to construct the navigation query.

93. The system of claim **90**, wherein the spoken language processing logic dynamically scrapes the online scripted interface.

94. The system of claim **90**, wherein the query construction logic constructs the query in the format of a database query language.

95. The system of claim **90**, wherein at least a portion of the spoken language processing logic is hosted on a computing device located locally with the user, and wherein the portable microphone is electronically coupled to the local computing device.

96. The system of claim **90**, wherein at least a portion of the spoken language processing logic is hosted on a network computing device located remotely from the user, and wherein the portable microphone sends data to the remote network computing device via the communications infrastructure.

97. The system of claim **90**, wherein the user interaction logic solicits additional input in response to one or more deficiencies encountered during construction of the navigation query.

98. The system of claim **97**, wherein the deficiencies include unresolved words of the spoken NL request.

99. The system of claim **97**, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken NL request.

100. The system of claim **90**, wherein the user interaction logic solicits additional input in response to one or more deficiencies encountered after a first navigation of the data source performed by the navigation logic.

101. The system of claim **100**, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

102. The system of claim **100**, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

103. The system of claim **100**, wherein the user interaction logic displays an option menu.

104. The system of claim **103**, wherein the act of selecting from the displayed option menu is performed by speaking.

105. The system of claim **90**, wherein the navigation logic selects the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken NL request.

106. The system of claim **90**, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

107. The system of claim **90**, wherein the display device receives data from the electronic data source on the network servers via a communications box.

108. The system of claim **90**, wherein the electronic communication infrastructure is a two-way infrastructure and is selected from among one or more of the following group: {coaxial cable, DSL, satellite, wireless/cellular, fiber-optic}.

109. A computer program embodied on a computer readable medium for utilizing spoken natural language for navigating an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising:

(a) a code segment that receives a spoken natural language ("NL") request for desired information from the user;

(b) a code segment that renders an interpretation of the spoken natural language request,

(c) a code segment that constructs at least part of a navigation query based upon the interpretation;

(d) a code segment that solicits additional input from the user, including user interaction in a non-spoken modality different than the original request without requiring the user to request said non-spoken modality;

(e) a code segment that refines the navigation query, based upon the additional inputs;

(f) a code segment that uses the refined navigation query to select a portion of the electronic data source; and

(g) a code segment that transmits the selected portion of the electronic data source from the network server to a primarily stationary, display device located locally with the user.

110. The computer program of claim **109**, further comprising a code segment that derives linguistic information by using a speech recognition engine and an NL parser.

111. The computer program of claim **109**, further comprising a code segment that extract an input template for an online scripted interface to the data source, and a code segment that uses the input template to construct the navigation query.

112. The computer program of claim **111**, further comprising a code segment that dynamically scrapes the online scripted interface.

113. The computer program of claim **109**, wherein the navigation query is constructed in the format of a database query language.

114. The computer program of claim **109**, wherein rendering of the interpretation and the construction of the navigation query are performed, at least in part, on a computing device located locally with the user.

115. The computer program of claim **109**, wherein the rendering of the interpretation and the construction of a navigation query are performed, at least in part, on a network computing device located remotely from the user.

116. The computer program of claim **109**, wherein code segment that solicits additional input solicits the additional input in response to one or more deficiencies encountered during the constructing of the navigation query.

117. The computer program of claim **116**, wherein the deficiencies include unresolved words of the spoken NL request.

118. The computer program of claim **116**, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken NL request.

119. The computer program of claim **109**, wherein the code segment that solicits the additional input solicits the additional input in response to one or more deficiencies encountered after a first navigation of the data source.

120. The computer program of claim **119**, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

121. The computer program of claim **119**, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

122. The computer program of claim **109**, wherein code segment that solicits additional input displays an option menu.

123. The computer program of claim **122**, wherein the act of selecting from the displayed option menu is performed by speaking.

124. The computer program of claim **109**, wherein the code segments of the computer program operate with respect to a plurality of simultaneous users and corresponding client devices.

125. The computer program of claim **109**, further comprising a code segment that selects the data source from among a plurality of candidate electronic data sources, in response to the interpretation of the spoken NL request.

126. The computer program of claim **109**, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

127. A method for utilizing spoken natural language for navigating an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising the steps of:

(a) receiving a spoken natural language ("NL") request for desired information from the user;

(b) rendering an interpretation of the spoken request;

(c) constructing at least part of a navigation query based upon the interpretation;

(d) soliciting additional input from the user, including user interaction in a non-spoken modality different than the original request, in accordance with results generated from said at least part of a navigation query;

(e) refining the navigation query, based upon the additional input;

(f) using the refined navigation query to select a portion of the electronic data source; and

(g) transmitting the selected portion of the electronic data source from the network server to a client device of the user.

128. The method of claim **127**, wherein the input modality of step (d) includes selecting from a displayed option menu.

129. The method of claim **128**, wherein the act of selecting from the displayed option menu is performed by speaking.

130. A method for utilizing spoken natural language for navigating an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising the steps of:

(a) receiving a spoken natural language ("NL") request for desired information from the user;

(b) rendering an interpretation of the spoken request;

(c) constructing at least part of a navigation query based upon the interpretation;

(d) soliciting additional input from the user, including user interaction in a non-spoken modality different than the original request, in response to one or more deficiencies encountered during the step of constructing said at least part of a navigation query;

(e) refining the navigation query, based upon the additional input;

(f) using the refined navigation query to select a portion of the electronic data source; and

(g) transmitting the selected portion of the electronic data source from the network server to a client device of the user.

131. The method of claim **130**, wherein the input modality of step (d) includes selecting from a displayed option menu.

132. The method of claim **131**, wherein the act of selecting from the displayed option menu is performed by speaking.

* * * * *

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(12) United States Patent
Halverson et al.

(10) Patent No.: US 6,757,718 B1
(45) Date of Patent: Jun. 29, 2004

(54) **MOBILE NAVIGATION OF NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN INPUT**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) bydays.days.

(21) Appl. No.: **09/608,872**

(22) Filed: **Jun. 30, 2000**

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(60) Provisional application No. 60/124,720, filed on Mar. 17, 1999, provisional application No. 60/124,719, filed on Mar. 17, 1999, and provisional application No. 60/124,718, filed on Mar. 17, 1999.

(51) **Int. Cl.**[7] **G06F 15/16**

(52) **U.S. Cl.** **709/218**; 709/202; 709/217; 709/219; 709/227; 704/257

(58) **Field of Search** 709/202, 218, 709/217, 219, 227; 707/5, 3, 4; 704/257, 270.1, 275, 246

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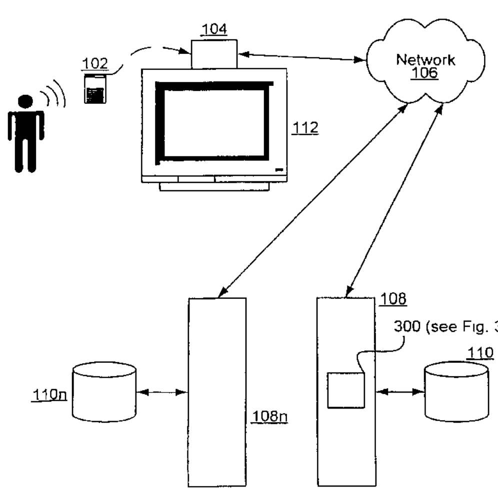
Primary Examiner—Frantz B Jean
(74) *Attorney, Agent, or Firm*—Moser, Patterson & Sheridan, LLP; Kin-Wah Tong

(57) **ABSTRACT**

A system, method, and article of manufacture are provided for navigating an electronic data source by means of spoken language where a portion of the data link between a mobile information appliance of the user and the data source utilizes wireless communication. When a spoken input request is received from a user who is using the mobile information appliance, it is interpreted. The resulting interpretation of the request is thereupon used to automatically construct an operational navigation query to retrieve the desired information from one or more electronic network data sources, which is transmitted to the mobile information appliance.

27 Claims, 7 Drawing Sheets



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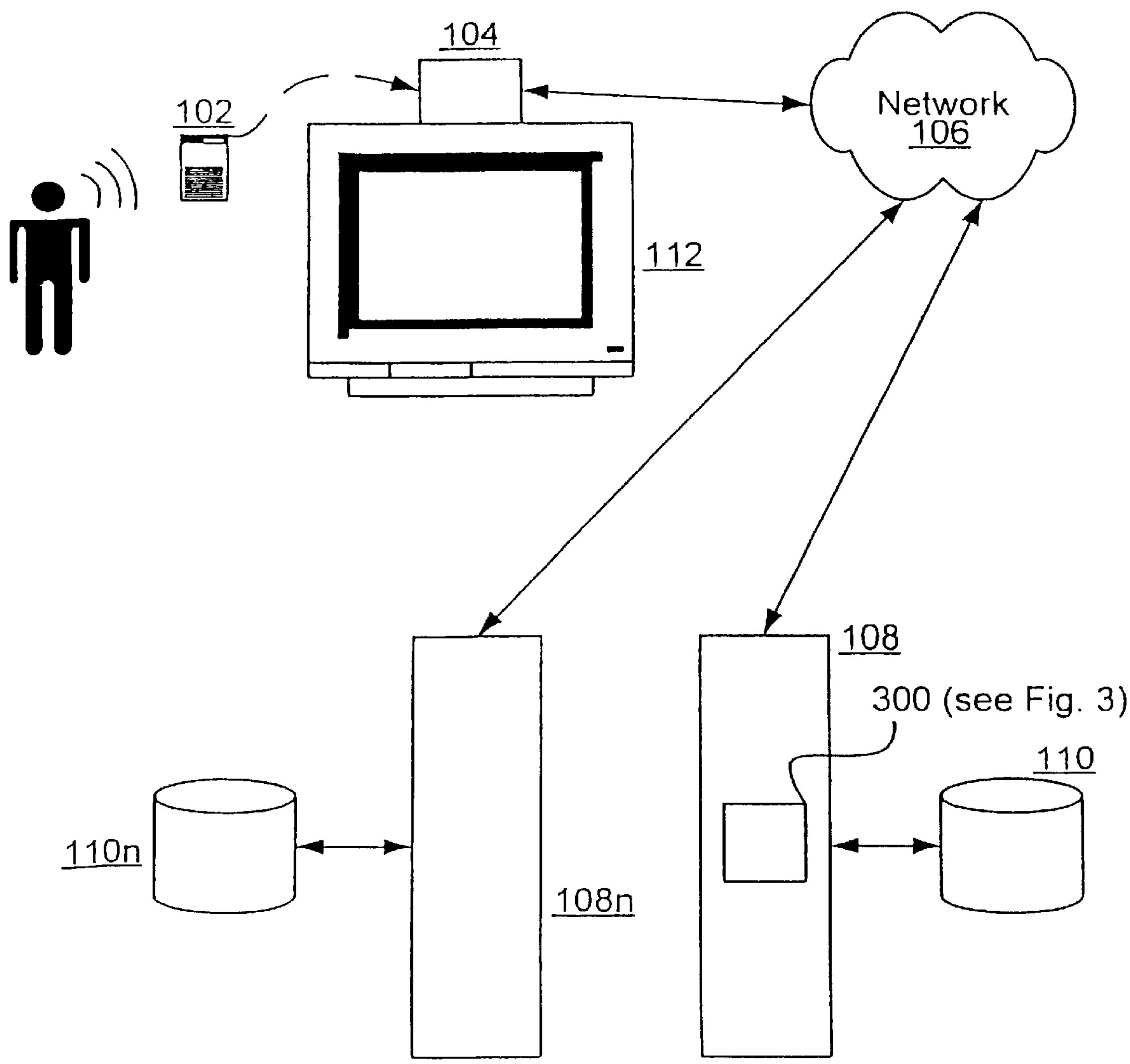

Fig. 1a

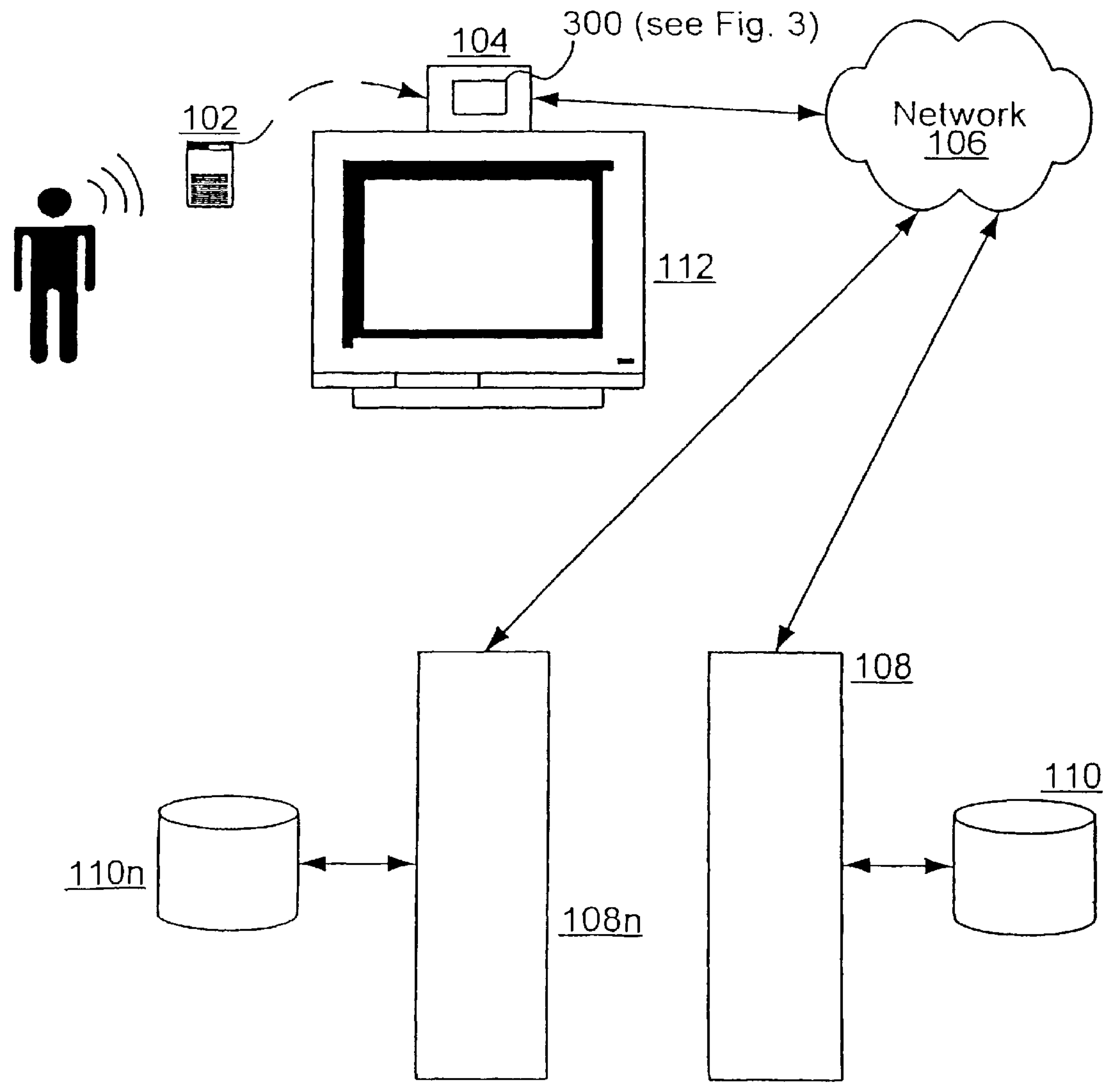

Fig. 1b

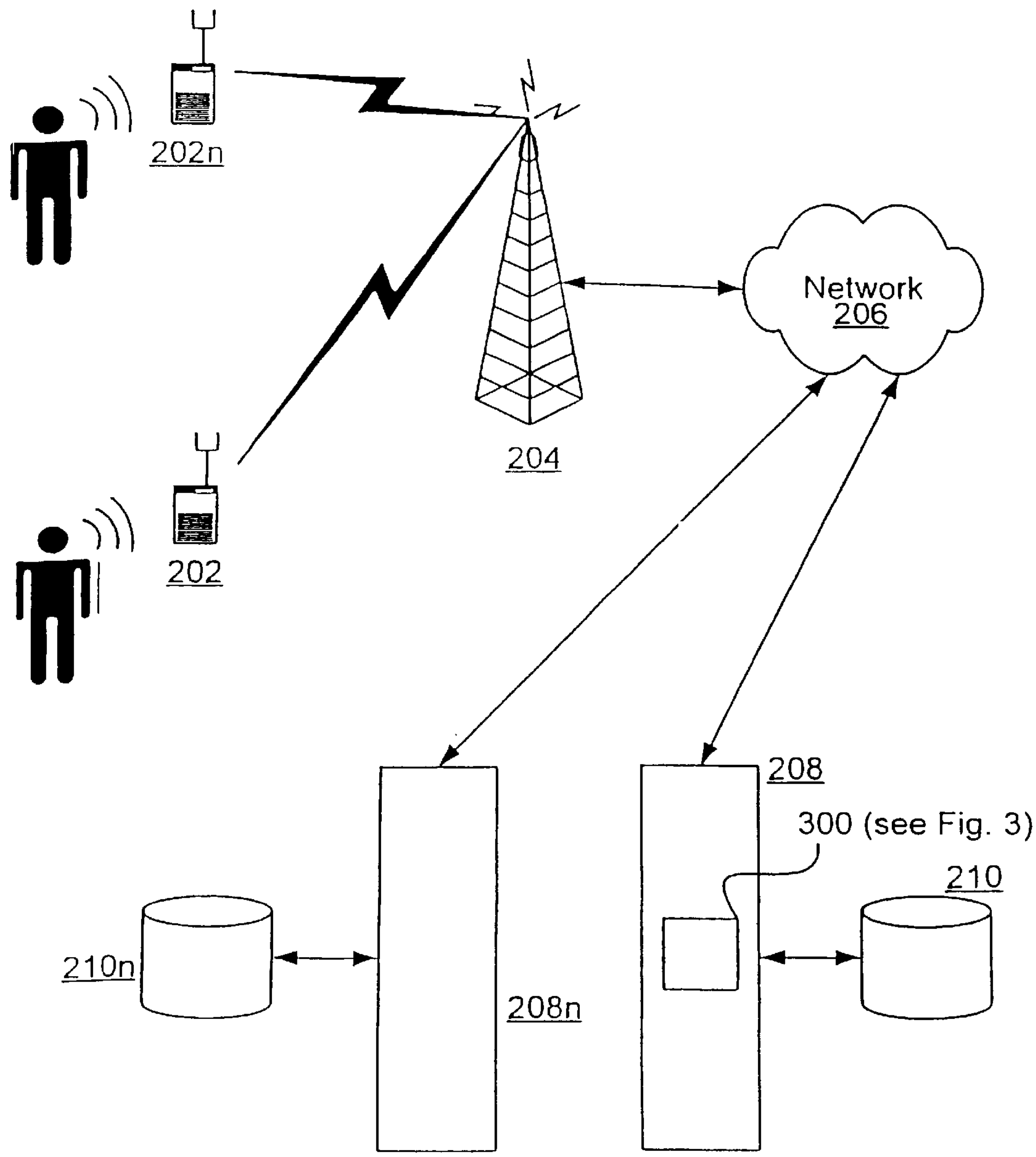

Fig. 2

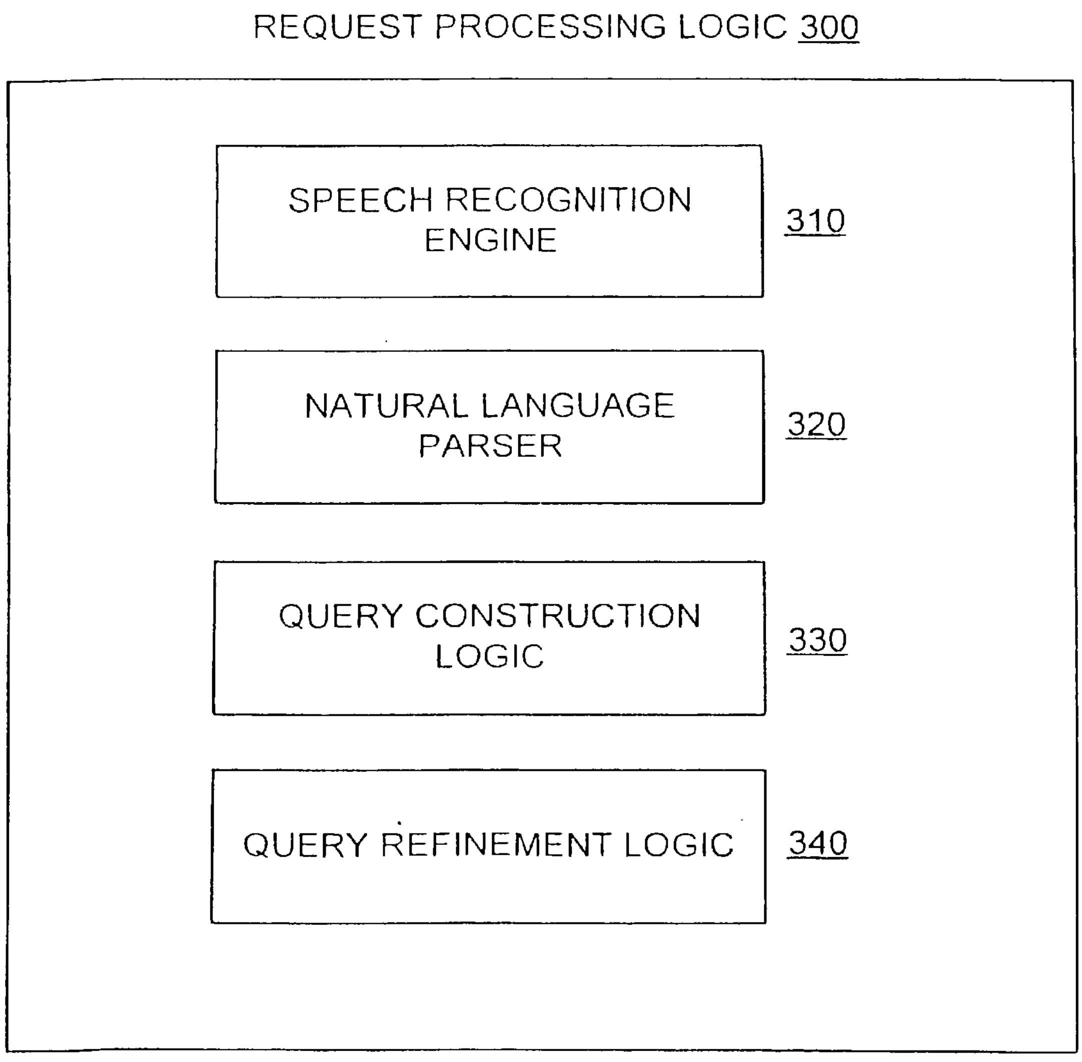
REQUEST PROCESSING LOGIC 300
SPEECH RECOGNITION ENGINE
310
NATURAL LANGUAGE PARSER
320
QUERY CONSTRUCTION LOGIC
330
QUERY REFINEMENT LOGIC
340

Fig. 3

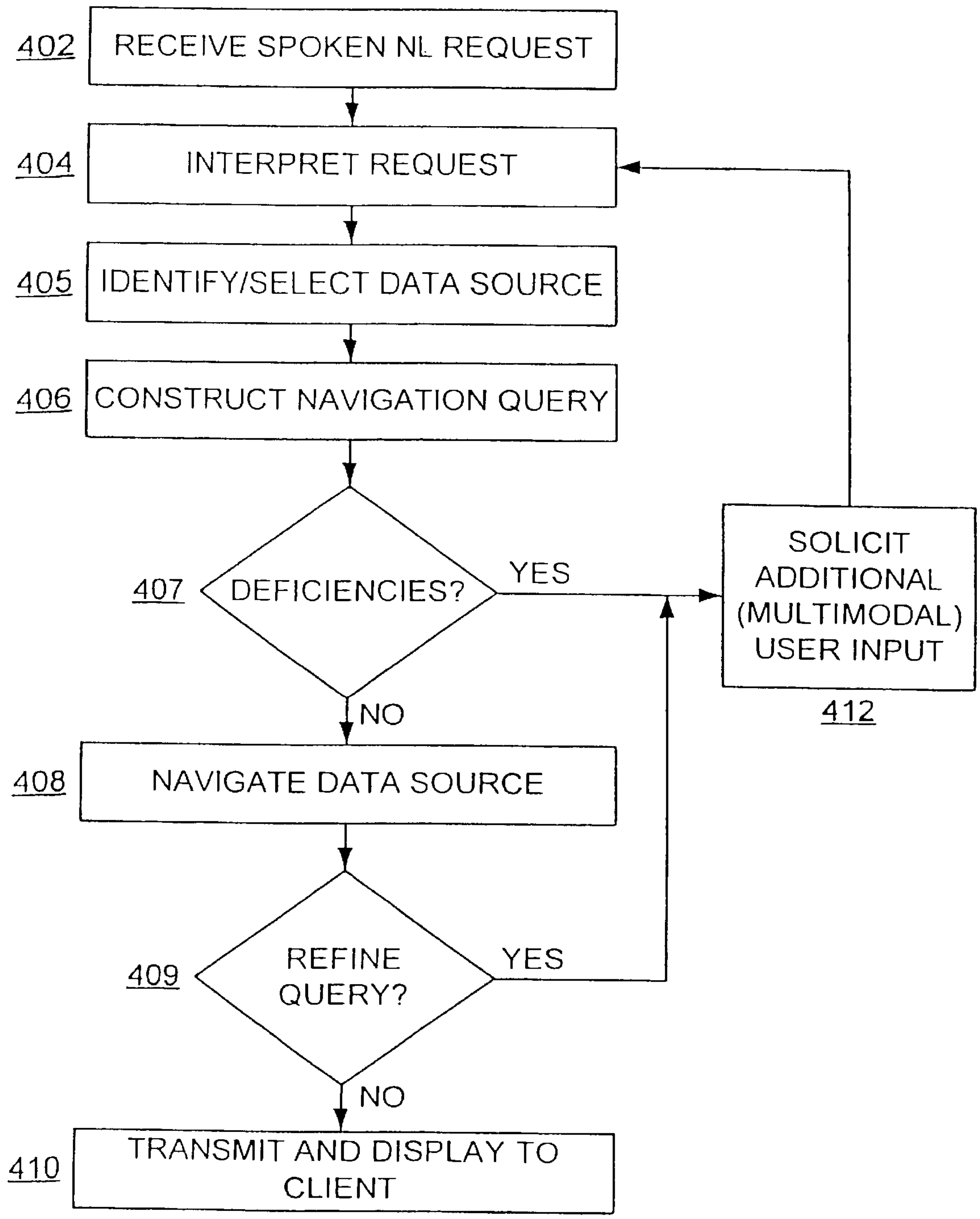
402
RECEIVE SPOKEN NL REQUEST
404
INTERPRET REQUEST
405
IDENTIFY/SELECT DATA SOURCE
406
CONSTRUCT NAVIGATION QUERY
407
DEFICIENCIES?
YES
NO
SOLICIT ADDITIONAL (MULTIMODAL) USER INPUT
412
408
NAVIGATE DATA SOURCE
409
REFINE QUERY?
YES
NO
410
TRANSMIT AND DISPLAY TO CLIENT

Fig. 4

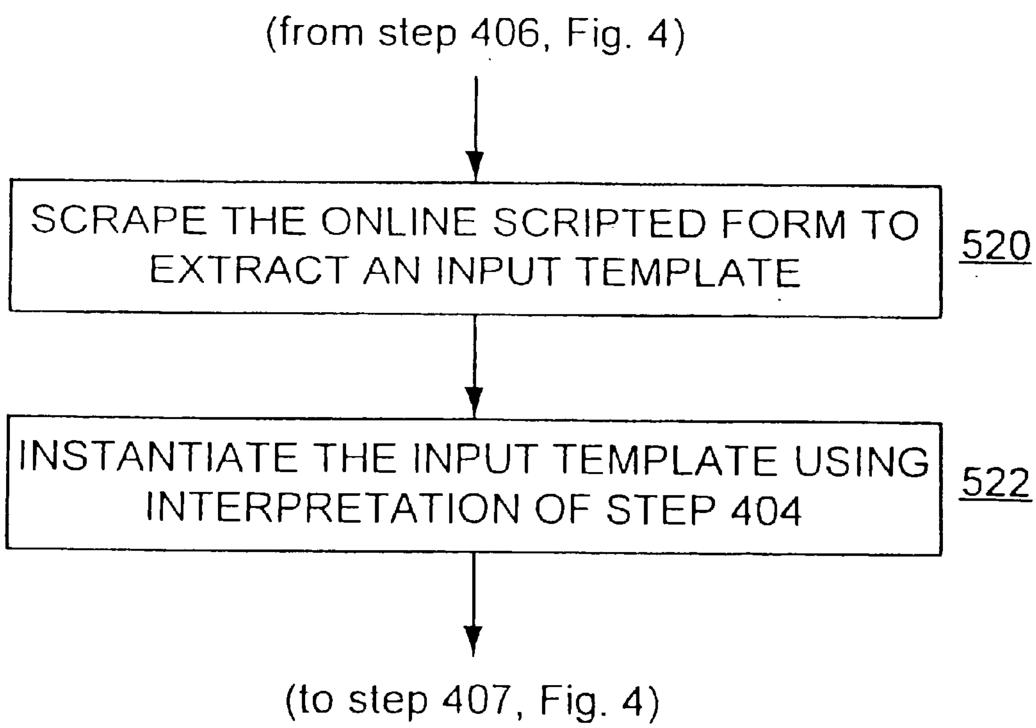
(from step 406, Fig. 4)
SCRAPE THE ONLINE SCRIPTED FORM TO EXTRACT AN INPUT TEMPLATE
520
INSTANTIATE THE INPUT TEMPLATE USING INTERPRETATION OF STEP 404
522
(to step 407, Fig. 4)

Fig. 5

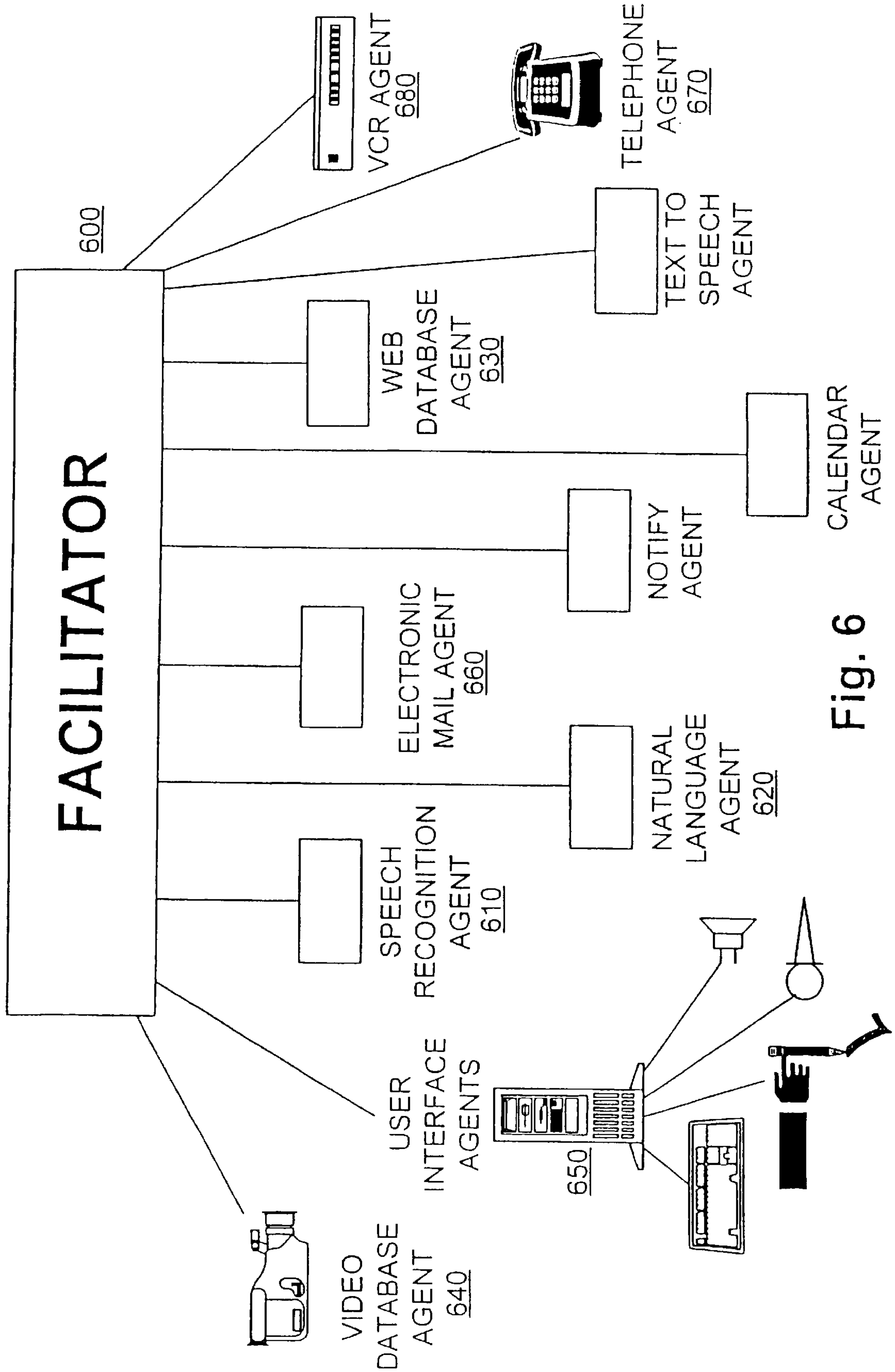
FACILITATOR
600
VCR AGENT
680
TELEPHONE
AGENT
670
TEXT TO
SPEECH
AGENT
WEB
DATABASE
AGENT
630
CALENDAR
AGENT
NOTIFY
AGENT
ELECTRONIC
MAIL AGENT
660
NATURAL
LANGUAGE
AGENT
620
SPEECH
RECOGNITION
AGENT
610
USER
INTERFACE
AGENTS
650
VIDEO
DATABASE
AGENT
640

Fig. 6

MOBILE NAVIGATION OF NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN INPUT

This application is a continuation of an application entitled NAVIGATING NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK which was filed on Mar. 13, 2000 under Ser. No. 09/524,095 and which is a Continuation In Part of co-pending U.S. patent application Ser. No. 09/225,198, filed Jan. 5, 1999, Provisional U.S. patent application Ser. No. 60/124,718, filed Mar. 17, 1999, Provisional U.S. patent application Ser. No. 60/124,720, filed Mar. 17, 1999, and Provisional U.S. patent application Ser. No. 60/124,719, filed Mar. 17, 1999, from which applications priority is claimed and these application are incorporated herein by reference.

BACKGROUND OF THE INVENTION

The present invention relates generally to the navigation of electronic data by means of spoken natural language requests, and to feedback mechanisms and methods for resolving the errors and ambiguities that may be associated with such requests.

As global electronic connectivity continues to grow, and the universe of electronic data potentially available to users continues to expand, there is a growing need for information navigation technology that allows relatively naive users to navigate and access desired data by means of natural language input. In many of the most important markets—including the home entertainment arena, as well as mobile computing—spoken natural language input is highly desirable, if not ideal. As just one example, the proliferation of high-bandwidth communications infrastructure for the home entertainment market (cable, satellite, broadband) enables delivery of movies-on-demand and other interactive multimedia content to the consumer's home television set. For users to take full advantage of this content stream ultimately requires interactive navigation of content databases in a manner that is too complex for user-friendly selection by means of a traditional remote-control clicker. Allowing spoken natural language requests as the input modality for rapidly searching and accessing desired content is an important objective for a successful consumer entertainment product in a context offering a dizzying range of database content choices. As further examples, this same need to drive navigation of (and transaction with) relatively complex data warehouses using spoken natural language requests applies equally to surfing the Internet/Web or other networks for general information, multimedia content, or e-commerce transactions.

In general, the existing navigational systems for browsing electronic databases and data warehouses (search engines, menus, etc.), have been designed without navigation via spoken natural language as a specific goal. So today's world is full of existing electronic data navigation systems that do not assume browsing via natural spoken commands, but rather assume text and mouse-click inputs (or in the case of TV remote controls, even less). Simply recognizing voice commands within an extremely limited vocabulary and grammar—the spoken equivalent of button/click input (e.g., speaking "channel 5" selects TV channel 5)—is really not sufficient by itself to satisfy the objectives described above. In order to deliver a true "win" for users, the voice-driven front-end must accept spoken natural language input in a manner that is intuitive to users. For example, the front-end should not require learning a highly specialized command language or format. More fundamentally, the front-end must allow users to speak directly in terms of what the user ultimately wants —e.g., "I'd like to see a Western film directed by Clint Eastwood" —as opposed to speaking in terms of arbitrary navigation structures (e.g., hierarchical layers of menus, commands, etc.) that are essentially artifacts reflecting constraints of the pre-existing text/click navigation system. At the same time, the front-end must recognize and accommodate the reality that a stream of naive spoken natural language input will, over time, typically present a variety of errors and/or ambiguities: e.g., garbled/unrecognized words (did the user say "Eastwood" or "Easter"?) and under-constrained requests ("Show me the Clint Eastwood movie"). An approach is needed for handling and resolving such errors and ambiguities in a rapid, user-friendly, non-frustrating manner.

What is needed is a methodology and apparatus for rapidly constructing a voice-driven front-end atop an existing, non-voice data navigation system, whereby users can interact by means of intuitive natural language input not strictly conforming to the step-by-step browsing architecture of the existing navigation system, and wherein any errors or ambiguities in user input are rapidly and conveniently resolved. The solution to this need should be compatible with the constraints of a multi-user, distributed environment such as the Internet/Web or a proprietary high-bandwidth content delivery network; a solution contemplating one-at-a-time user interactions at a single location is insufficient, for example.

SUMMARY OF THE INVENTION

The present invention addresses the above needs by providing a system, method, and article of manufacture for mobile navigation of network-based electronic data sources in response to spoken input requests. When a spoken input request is received from a user using a mobile information appliance that communicates with a network server via an at least partially wireless communications system, it is interpreted, such as by using a speech recognition engine to extract speech data from acoustic voice signals, and using a language parser to linguistically parse the speech data. The interpretation of the spoken request can be performed on a computing device locally with the user, such as the mobile information appliance, or remotely from the user. The resulting interpretation of the request is thereupon used to automatically construct an operational navigation query to retrieve the desired information from one or more electronic network data sources, which is then transmitted to a client device of the user. If the network data source is a database, the navigation query is constructed in the format of a database query language.

Typically, errors or ambiguities emerge in the interpretation of the spoken request, such that the system cannot instantiate a complete, valid navigational template. This is to be expected occasionally, and one preferred aspect of the invention is the ability to handle such errors and ambiguities in relatively graceful and user-friendly manner. Instead of simply rejecting such input and defaulting to traditional input modes or simply asking the user to try again, a preferred embodiment of the present invention seeks to converge rapidly toward instantiation of a valid navigational template by soliciting additional clarification from the user as necessary, either before or after a navigation of the data source, via multimodal input, i.e., by means of menu selection or other input modalities including and in addition to spoken input. This clarifying, multi-modal dialogue takes advantage of whatever partial navigational information has been gleaned from the initial interpretation of the user's spoken request. This clarification process continues until the system converges toward an adequately instantiated navigational template, which is in turn used to navigate the network-based data and retrieve the user's desired information. The retrieved information is transmitted across the network and presented to the user on a suitable client display device.

In a further aspect of the present invention, the construction of the navigation query includes extracting an input template for an online scripted interface to the data source and using the input template to construct the navigation query. The extraction of the input template can include dynamically scraping the online scripted interface.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention, together with further advantages thereof, may best be understood by reference to the following description taken in conjunction with the accompanying drawings in which:

FIG. **1***a* illustrates a system providing a spoken natural language interface for network-based information navigation, in accordance with an embodiment of the present invention with server-side processing of requests;

FIG. **1***b* illustrates another system providing a spoken natural language interface for network-based information navigation, in accordance with an embodiment of the present invention with client-side processing of requests;

FIG. **2** illustrates a system providing a spoken natural language interface for network-based information navigation, in accordance with an embodiment of the present invention for a mobile computing scenario;

FIG. **3** illustrates the functional logic components of a request processing module in accordance with an embodiment of the present invention;

FIG. **4** illustrates a process utilizing spoken natural language for navigating an electronic database in accordance with one embodiment of the present invention;

FIG. **5** illustrates a process for constructing a navigational query for accessing an online data source via an interactive, scripted (e.g., CGI) form; and

FIG. **6** illustrates an embodiment of the present invention utilizing a community of distributed, collaborating electronic agents.

DETAILED DESCRIPTION OF THE INVENTION

1. System Architecture

a. Server-End Processing of Spoken Input

FIG. **1***a* is an illustration of a data navigation system driven by spoken natural language input, in accordance with one embodiment of the present invention. As shown, a user's voice input data is captured by a voice input device **102**, such as a microphone. Preferably voice input device **102** includes a button or the like that can be pressed or held-down to activate a listening mode, so that the system need not continually pay attention to, or be confused by, irrelevant background noise. In one preferred embodiment well-suited for the home entertainment setting, voice input device **102** is a portable remote control device with an integrated microphone, and the voice data is transmitted from device **102** preferably via infrared (or other wireless) link to communications box **104** (e.g., a set-top box or a similar communications device that is capable of retransmitting the raw voice data and/or processing the voice data) local to the user's environment and coupled to communications network **106**. The voice data is then transmitted across network **106** to a remote server or servers **108**. The voice data may preferably be transmitted in compressed digitized form, or alternatively—particularly where bandwidth constraints are significant—in analog format (e.g., via frequency modulated transmission), in the latter case being digitized upon arrival at remote server **108**.

At remote server **108**, the voice data is processed by request processing logic **300** in order to understand the user's request and construct an appropriate query or request for navigation of remote data source **110**, in accordance with the interpretation process exemplified in FIG. **4** and FIG. **5** and discussed in greater detail below. For purposes of executing this process, request processing logic **300** comprises functional modules including speech recognition engine **310**, natural language (NL) parser **320**, query construction logic **330**, and query refinement logic **340**, as shown in FIG. **3**. Data source **110** may comprise database(s), Internet/web site(s), or other electronic information repositories, and preferably resides on a central server or servers—which may or may not be the same as server **108**, depending on the storage and bandwidth needs of the application and the resources available to the practitioner. Data source **110** may include multimedia content, such as movies or other digital video and audio content, other various forms of entertainment data, or other electronic information. The contents of data source **110** are navigated—i.e., the contents are accessed and searched, for retrieval of the particular information desired by the user—using the processes of FIGS. **4** and **5** as described in greater detail below.

Once the desired information has been retrieved from data source **110**, it is electronically transmitted via network **106** to the user for viewing on client display device **112**. In a preferred embodiment well-suited for the home entertainment setting, display device **112** is a television monitor or similar audiovisual entertainment device, typically in stationary position for comfortable viewing by users. In addition, in such preferred embodiment, display device **112** is coupled to or integrated with a communications box (which is preferably the same as communications box **104**, but may also be a separate unit) for receiving and decoding/formatting the desired electronic information that is received across communications network **106**.

Network **106** is a two-way electronic communications network and may be embodied in electronic communication infrastructure including coaxial (cable television) lines, DSL, fiber-optic cable, traditional copper wire (twisted pair), or any other type of hardwired connection. Network **106** may also include a wireless connection such as a satellite-based connection, cellular connection, or other type of wireless connection. Network **106** may be part of the Internet and may support TCP/IP communications, or may be embodied in a proprietary network, or in any other electronic communications network infrastructure, whether packet-switched or connection-oriented. A design consideration is that network **106** preferably provide suitable bandwidth depending upon the nature of the content anticipated for the desired application.

b. Client-End Processing of Spoken Input

FIG. **1***b* is an illustration of a data navigation system driven by spoken natural language input, in accordance with a second embodiment of the present invention. Again, a user's voice input data is captured by a voice input device

102, such as a microphone. In the embodiment shown in FIG. 1b, the voice data is transmitted from device 202 to requests processing logic 300, hosted on a local speech processor, for processing and interpretation. In the preferred embodiment illustrated in FIG. 1b, the local speech processor is conveniently integrated as part of communications box 104, although implementation in a physically separate (but communicatively coupled) unit is also possible as will be readily apparent to those of skill in the art. The voice data is processed by the components of request processing logic 300 in order to understand the user's request and construct an appropriate query or request for navigation of remote data source 110, in accordance with the interpretation process exemplified in FIGS. 4 and 5 as discussed in greater detail below.

The resulting navigational query is then transmitted electronically across network 106 to data source 110, which preferably resides on a central server or servers 108. As in FIG. 1a, data source 110 may comprise database(s), Internet/web site(s), or other electronic information repositories, and preferably may include multimedia content, such as movies or other digital video and audio content, other various forms of entertainment data, or other electronic information. The contents of data source 110 are then navigated—i.e., the contents are accessed and searched, for retrieval of the particular information desired by the user—preferably using the process of FIGS. 4 and 5 as described in greater detail below. Once the desired information has been retrieved from data source 110, it is electronically transmitted via network 106 to the user for viewing on client display device 112.

In one embodiment in accordance with FIG. 1b and well-suited for the home entertainment setting, voice input device 102 is a portable remote control device with an integrated microphone, and the voice data is transmitted from device 102 preferably via infrared (or other wireless) link to the local speech processor. The local speech processor is coupled to communications network 106, and also preferably to client display device 112 (especially for purposes of query refinement transmissions, as discussed below in connection with FIG. 4, step 412), and preferably may be integrated within or coupled to communications box 104. In addition, especially for purposes of a home entertainment application, display device 112 is preferably a television monitor or similar audiovisual entertainment device, typically in stationary position for comfortable viewing by users. In addition, in such preferred embodiment, display device 112 is coupled to a communications box (which is preferably the same as communications box 104, but may also be a physically separate unit) for receiving and decoding/formatting the desired electronic information that is received across communications network 106.

Design considerations favoring server-side processing and interpretation of spoken input requests, as exemplified in FIG. 1a, include minimizing the need to distribute costly computational hardware and software to all client users in order to perform speech and language processing. Design considerations favoring client-side processing, as exemplified in FIG. 1b, include minimizing the quantity of data sent upstream across the network from each client, as the speech recognition is performed before transmission across the network and only the query data and/or request needs to be sent, thus reducing the upstream bandwidth requirements.

c. Mobile Client Embodiment

A mobile computing embodiment of the present invention may be implemented by practitioners as a variation on the embodiments of either FIG. 1a or FIG. 1b. For example, as depicted in FIG. 2, a mobile variation in accordance with the server-side processing architecture illustrated in FIG. 1a may be implemented by replacing voice input device 102, communications box 104, and client display device 112, with an integrated, mobile, information appliance 202 such as a cellular telephone or wireless personal digital assistant (wireless PDA). Mobile information appliance 202 essentially performs the functions of the replaced components. Thus, mobile information appliance 202 receives spoken natural language input requests from the user in the form of voice data, and transmits that data (preferably via wireless data receiving station 204) across communications network 206 for server-side interpretation of the request, in similar fashion as described above in connection with FIG. 1. Navigation of data source 210 and retrieval of desired information likewise proceeds in an analogous manner as described above. Display information transmitted electronically back to the user across network 206 is displayed for the user on the display of information appliance 202, and audio information is output through the appliance's speakers.

Practitioners will further appreciate, in light of the above teachings, that if mobile information appliance 202 is equipped with sufficient computational processing power, then a mobile variation of the client-side architecture exemplified in FIG. 2 may similarly be implemented. In that case, the modules corresponding to request processing logic 300 would be embodied locally in the computational resources of mobile information appliance 202, and the logical flow of data would otherwise follow in a manner analogous to that previously described in connection with FIG. 1b.

As illustrated in FIG. 2, multiple users, each having their own client input device, may issue requests, simultaneously or otherwise, for navigation of data source 210. This is equally true (though not explicitly drawn) for the embodiments depicted in FIGS. 1a and 1b. Data source 210 (or 100), being a network accessible information resource, has typically already been constructed to support access requests from simultaneous multiple network users, as known by practitioners of ordinary skill in the art. In the case of server-side speech processing, as exemplified in FIGS. 1a and 2, the interpretation logic and error correction logic modules are also preferably designed and implemented to support queuing and multi-tasking of requests from multiple simultaneous network users, as will be appreciated by those of skill in the art.

It will be apparent to those skilled in the art that additional implementations, permutations and combinations of the embodiments set forth in FIGS. 1a, 1b, and 2 may be created without straying from the scope and spirit of the present invention. For example, practitioners will understand, in light of the above teachings and design considerations, that it is possible to divide and allocate the functional components of request processing logic 300 between client and server. For example, speech recognition—in entirety, or perhaps just early stages such as feature extraction—might be performed locally on the client end, perhaps to reduce bandwidth requirements, while natural language parsing and other necessary processing might be performed upstream on the server end, so that more extensive computational power need not be distributed locally to each client. In that case, corresponding portions of request processing logic 300, such as speech recognition engine 310 or portions thereof, would reside locally at the client as in FIG. 1b, while other component modules would be hosted at the server end as in FIGS. 1a and 2.

Further, practitioners may choose to implement the each of the various embodiments described above on any number of different hardware and software computing platforms and