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

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Subclass	6757118
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U.S. UTILITY Patent Applica	ation
O.I.P.E.	PATENT DATE
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TERMINAL DRAWINGS DISCLAIMER Sheets Drwg Figs. Drwg. Print Fig.	CLAIMS ALLOWED Total Claims Print Claim for O.G.
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WARNING: The information disclosed herein may be restricted ≋Unauthorized disclosure may be prohibited by the	e United States Code Title 35, Sections 122, 181 and 368.
Possession outside the U.S. Patent & Trademark Office is restricted to authorized employees and cont	ractors only.
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ISSUE FEE IN FILE	
(FACE) Petitioner M	icrosoft Corporation - Ex. 1008, p. 2

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 MailedApplication IncompleteFiling 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)
10-01-2001	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
10-01-2002	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
03-10-2003	Mail Notice of Allowance
03-11-2003	Mail Formal Drawings Required
03-11-2003	Dispatch to Publications
05-15-2003	Issue Fee Payment Verified
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05-06-2003	Workflow - Drawings Finished
05-06-2003	Workflow - Drawings Hinshed 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

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CONTENTS

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(1) Application papers.		42		<u> </u>	
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INTERFERENCE SEARCHED Class Sub. Date Exmr. 709 202 3/763 Co 217 218 219 297 704 257

SEARCH NOTES (INCLUDING SEARCH STRATEG

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(RIGHT OUTSIDE)

Petitioner Microsoft Corporation - Ex. 1008, p.

& Call Frider per

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,

4B30/308-7800

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Search Results

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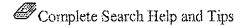
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END OF SEARCH HISTORY



(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)

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

Filed: Jun. 30, 2000

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

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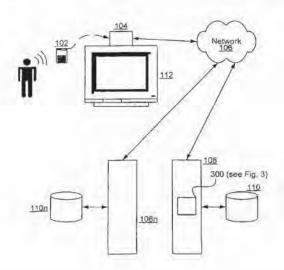
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ABSTRACT

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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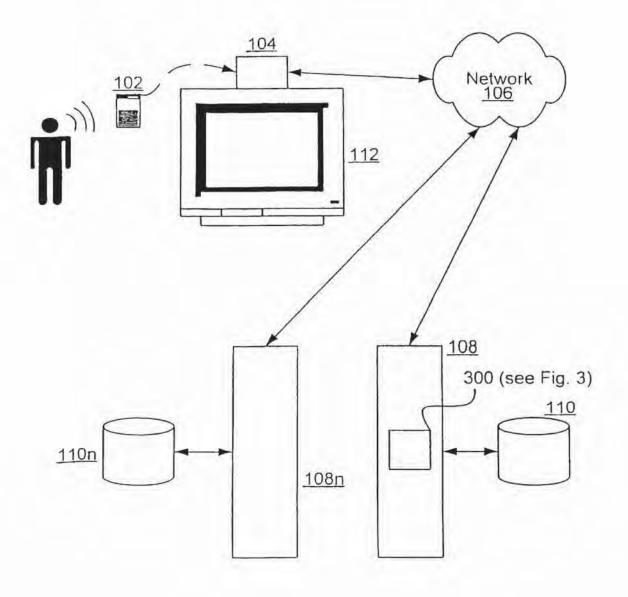


Fig. 1a

Jun. 29, 2004

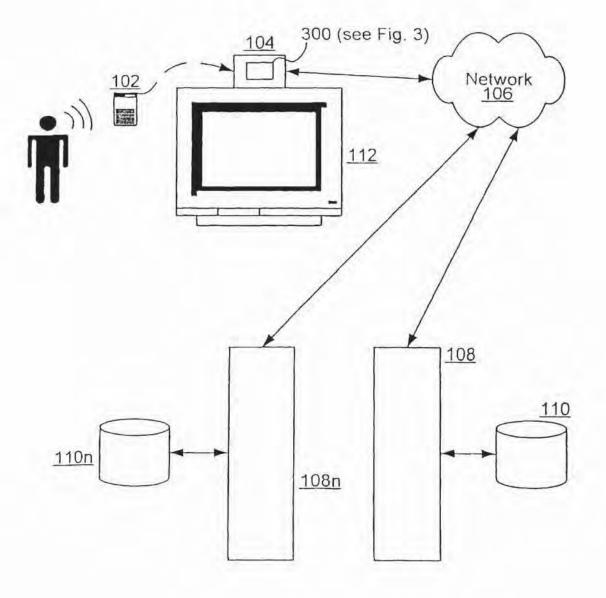


Fig. 1b

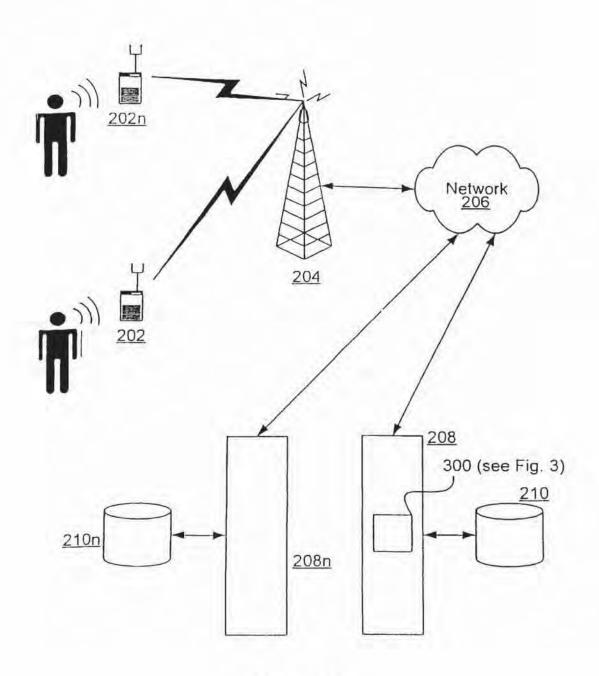


Fig. 2

REQUEST PROCESSING LOGIC 300

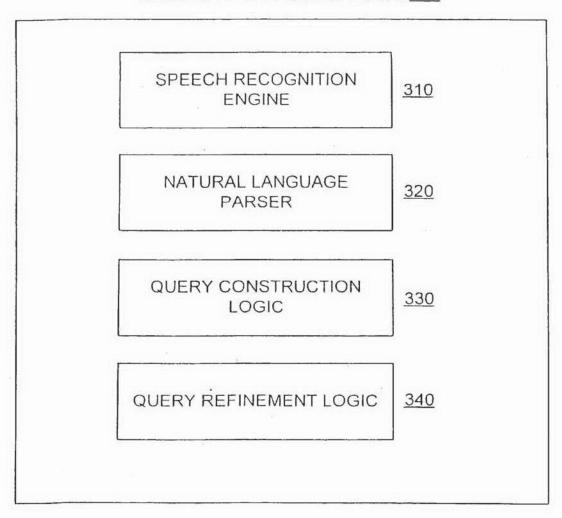


Fig. 3

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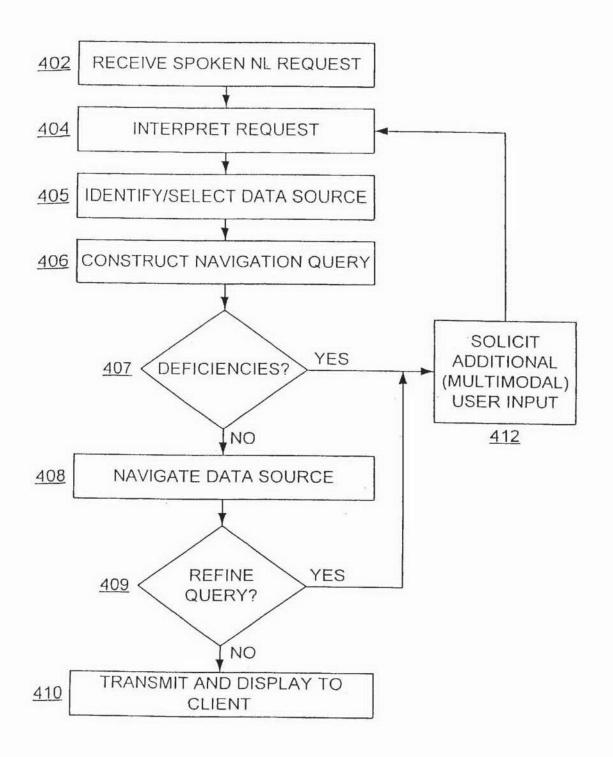


Fig. 4

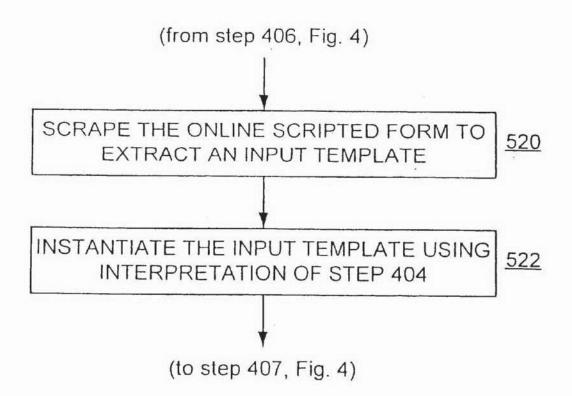
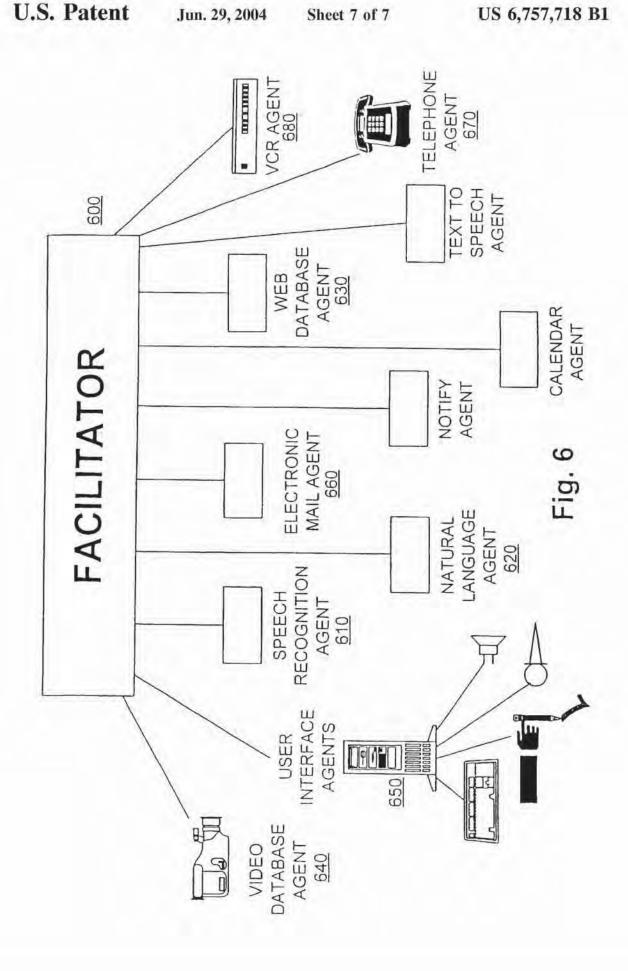


Fig. 5



MOBILE NAVIGATION OF NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN INPUT

This application is a continuation of an application 5 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 10 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, 15 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 marketsincluding 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 40 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 45 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 50 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, 55 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 60 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. 65 In order to deliver a true "win" for users, the voice-driven front-end must accept spoken natural language input in a

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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 15 dynamically scraping the online scripted interface.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention, together with further advantages thereof, 20 may best be understood by reference to the following description taken in conjunction with the accompanying drawings in which:

FIG. 1a illustrates a system providing a spoken natural language interface for network-based information 25 navigation, in accordance with an embodiment of the present invention with server-side processing of requests;

FIG. 1b illustrates another system providing a spoken natural language interface for network-based information navigation, in accordance with an embodiment of the 30 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. 1a is an illustration of a data navigation system driven by spoken natural language input, in accordance with 55 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 60 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 65 102 preferably via infrared (or other wireless) link to communications box 104 (e.g., a set-top box or a similar

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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 userusing 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. 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 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 10 300 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 20 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 25 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 45 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 50 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 55 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 60 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 65 embodiments of either FIG. 1a or FIG. 1b. For example, as depicted in FIG. 2, a mobile variation in accordance with the 6

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

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 20 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 25 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, 30 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 35 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 40 stream of recognized words.

Typically, the speech recognition engine is provided with 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, 45 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 50 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 recogni- 60 tion 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 65 textual output of the speech recognition engine. In a preferred embodiment of the present invention, the natural-

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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 10 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/spnlint.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 20 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 30 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 40 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 50 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 55 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 templatein 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 con-

structed 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, nonvoice 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 onemonth 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, 5 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 10 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 20 ("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 25 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 30 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 35 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 40 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 45 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 65 might preferably generate a display for client display device 112 showing the (relatively short) list of film titles that

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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 5 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 10 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 ArchitectureTM (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. 20 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 25 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 prefer- 30 ably 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 35 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 40 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 45 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 50 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 abovereferenced 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 'unified messaging" application. Another example is the InfoWiz interactive information kiosk developed by the assignee and described in the document entitled "InfoWiz: 60 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 65 'CommandTalk" application developed by the assignee for the U.S. military, as described online at http://

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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 agentsin 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 5 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 10 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 15 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 20 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 25 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 30 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 40 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 50 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 55 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

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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.
- 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.

with respect to multiple users.

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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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Please send correspondence to the following address:		
양	Kevin J. Zilka P.O. BOX 721030 San Jose, California 95172-1030	
Direct Telephone Calls To:	Kevin J. Zilka at telephone number (408) 505-5100	
Date: June 30, 2000	Kevin J. Zilka Registration No. 41 / 29	

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

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF EXPRESS MAILING Attorney Docket No.: SRI1P037B 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 First Named Inventor: on June 30, 2000 in an envelope as "Express Mail Post Office to Addressee" service under 37 CFR §1.10, Mailing Label Number EK858788212UF, addressed to the Assistant Commissioner for Patents, HALVERSEN, Christine Kevin J. Zille UTILITY PATENT APPLICATION TRANSMITTAL (37 CFR. § 1.53(b)) (Continuation, Divisional or Continuation-in-part application) Duplicate for Assistant Commissioner for Patents fee processing Box Patent Application Washington, DC 20231 This is a request for filing a patent application under 37 CFR: § 1.53(b) in the name of inventors: Sir: Christine Halversen, Luc Julia, Dimitris Voutsas, Adam Cheyer MOBILE NAVIGATION OF NETWORK-BASED ELECTRONIC INFORMATION USING For: 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 Page 1 of 3 (Revised 12/97, Pat App Trans 53(b) ContDivCIP)

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Direct Telephone Calls To:	Kevin J. Zilka at telephone number (408) 505-5100
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Date	Kevin J. Zilka Registration No. 41 929

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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.

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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 underconstrained requests ("Show me the Clint Eastwood movie"). An approach is needed for handling and resolving such errors and ambiguities in a rapid, user-friendly, nonfrustrating 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.

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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 meriu 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.

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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.

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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.

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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

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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

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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

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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 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.

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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

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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

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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

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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 Further details on this methodology are provided in the publication "Combining Linguistic and Statistical Knowledge Sources in Natural-Language ATIS" which currently available online Processing is 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

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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 mavigational 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

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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 substep 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,

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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 speken 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-ondemand 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

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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

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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

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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.

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3. Open Agent Architecture (OAA®)

Open Agent ArchitectureTM (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 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 Figure 13 and the corresponding discussion of a "multi-modal maps" application, and Figure 12 and the

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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

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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	1.	A method for utilizing spoken natural language for navigating an
2	electronic data	source, the electronic data source being located at one or more network
3	servers located	l remotely from a user, comprising the steps of:
4	(a) ₁₉ **	receiving a spoken natural language ("NL") request for desired
5		information from the user;
6	(b)	rendering an interpretation of the spoken natural language request;
7 8	(c)	constructing at least part of a navigation query based upon the interpretation;
9	(d)	soliciting additional input from the user, including user interaction in a
10		modality different than the original request;
11	(e)	refining the navigation query, based upon the additional input;
12	(f)	using the refined navigation query to select a portion of the electronic
13		data source; and
14	(g)	transmitting the selected portion of the electronic data source from the
15		network server to a client device of the user.
l	2.	The method of claim 1; wherein the step of rendering an interpretation
2	further includ	es deriving linguistic information by using a speech recognition engine
3	and an NL par	rser.
l	3.	The method of claim 1, wherein the step of constructing a navigation
2	query further	includes the steps of extracting an input template for an online scripted
3	interface to th	e data source, and using the input template to construct the navigation
4	query.	

1	4.	The method of claim 3, wherein the step of extracting an input
2	template inclu	des dynamically scraping the online scripted interface
l	5.	The method of claim 1, wherein the navigation query is constructed in
2	the format of a	a database query language.
1	6.	The method of claim 1, wherein the step of rendering an interpretation
2	and the step of	f constructing a navigation query are performed, at least in part, on a
3	computing dev	vice located locally with the user.
1	7.	The method of claim 1, wherein the step of rendering an interpretation
2	and the step of	f constructing a navigation query are performed, at least in part, on a
3	network comp	outing device located remotely from the user.
1	8.	The method of claim 1, wherein the step of soliciting additional input
2	is performed i	n response to one or more deficiencies encountered during the step of
3	-	navigation query.
1	9.	The method of claim 8, wherein the deficiencies include unresolved
2	words of the s	poken NZ request
1	10.	The method of claim 8, wherein the deficiencies include one or more
2	required eleme	ents of the nay/gational query not determinable from the interpretation
3	of the spoken	NL request
1	11.	The method of claim 1, wherein the step of soliciting additional input
2	is performed i	n response to one or more deficiencies encountered after a first
3	navigation of	the days source using the navigation query constructed in step (c).
1	12.	The method of claim 11, wherein the deficiencies include existence of
2	more than one	data record within the data source responsive to the navigation query.
1	13.	The method of claim 11, wherein the deficiencies include failure to
2	identify a sinb	le data record within the data source responsive to the navigation query.

selecting from a displayed option menu.

The method of claim 1, wherein the input modality of step (d) includes

1	15.	The method of claim 14, wherein the act of selecting from the
2	displayed opt	tion menu is performed by speaking.
1.	, .16.	The method of claim 1, wherein the method is performed with respect
2	to a plurality	of simultaneous users and corresponding client devices.
1	17.	The method of claim 1, further including the step of selecting the data
2	source from a	among a plurality of candidate electronic data sources, in response to the
3	interpretation	of the spoken NL request.
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1	18.	The method of claim 1, wherein the electronic data source stores
2	multimedia c	ontent including at least one of video content and audio content.
1	19.	A system for utilizing spoken natural language to navigate an
2	electronic da	ta source, the electronic data source being located at one or more network
3	servers locate	ed remotely from a user, the system comprising:
4	(a)	a portable microphone operable to receive a spoken natural language
	(α)	/
5		("NL") request for destred information from the user;
6	(b)	spoken language processing logic, operable to render an interpretation
7		of the spoken natural language request;
8	(c)	query construction logic, operable to construct a navigation query in
9		response to the interpretation of the spoken natural language request;
10	(d)	user interaction logic, operable to solicit additional input from the user,
11		including user interaction in a modality different than the original
12		request
13	(e)	quer refining logic, operable to refine the navigation query, based
14		upon the additional input;
15	(f)	navigation logic, operable to select a portion of the electronic data
16		source using the navigation query; and

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17	(g)	electronic communications infrastructure for transmitting the selected
-18		portion of the electronic data source from the network erver to a
19		primarily stationary, display device located locally with the user.
ì	20.	The system of claim 19, wherein the spoken language processing logic
2		ch recognition logic and an NL parsing logic for deriving linguistic
3	information.	
l	21.	The system of claim 19, wherein the spoken language processing logic
2	extracts an in	put template for an online scripted interface to the data source, and uses
3	the input tem	plate to construct the navigation query.
1	22.	The system of claim 21, wherein the spoken language processing logic
2	dynamically	scrapes the online scripted interface.
1	23.	The system of claim 19, wherein the query construction logic
2	constructs the	e query in the format of a database query language.
	24	
l	24.	The system of claim 19, wherein at least a portion of the spoken
2	language pro	cessing logic is hosted on a computing device located locally with the
3	user, and who	erein the portable pricrophone is electronically coupled to the local
4	computing de	evice.
ì	25.	The system of claim 19, wherein at least a portion of the spoken
2	language pro	cessing logic is hosted on a network computing device located remotely
3	from the user	, and wherein the portable microphone sends data to the remote network
4	computing de	vice via the communications infrastructure.
	•	/
ì	26.	The system of claim 19, wherein the user interaction logic solicits
2	additional inp	out in response to one or more deficiencies encountered during

The system of claim 26, wherein the deficiencies include unresolved

construction of the navigation query.

words of the spoken NL request.

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displayed option menu is performed by speaking.

	r
l	28. The system of claim 26, wherein the deficiencies include one or mor
2	required elements of the navigational query not determinable from the interpretation
3	of the spoken NL request.
l	29. The system of claim 19, wherein the user interaction logic solicits
2	additional input in response to one or more deficiencies encountered after a first
3	navigation of the data source performed by the navigation logic/
l	30. The system of claim 29, wherein the deficiencies include existence of
2	more than one data record within the data source responsive to the navigation query
	. /
l	31. The system of claim 29, wherein the deficiencies include failure to
2	identify a single data record within the data source responsive to the navigation que
l	32. The system of claim 19, wherein the user interaction logic displays a
2	option menu.
	,

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.

The system of claim 32, wherein the act of selecting from the

- 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 electronic data 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

3	electronic data	source being located at one or more network servers located remotely
4	from a user, co	omprising:
		(SNI ") request
5	(a)	a code segment that receives a spoken natural language ("NL") request
6		for desired information from the user;
7	(b)	a code segment that renders an interpretation of the spoken natural
8	•	language request;
9	(c)	a code segment that constructs at least part of a navigation query based
10	•	upon the interpretation;
11	(d)	a code segment that solicits additional input from the user, including
12		user interaction in a modality different than the original request;
13	(e)	a code segment that refines the navigation query, based upon the
	(6)	additional input;
14		additional impact,
15	(f)	a code segment that uses the refined navigation query to select a
16		portion of the electronic data source; and
17	(g)	a code segment that mansmits the selected portion of the electronic data
18	(6)	source from the negwork server to a primarily stationary, display
19	•	device located locally with the user.
.,		
1	39.	The computer program of claim 38, further comprising a code segment
2	that derives li	nguistic information by using a speech recognition engine and an NL
3	parser.	
1	40.	The computer program of claim 38, further comprising a code segment
2	that extract ar	n input template for an online scripted interface to the data source, and a
3	code segment	that uses the input template to construct the navigation query.
1	41.	The computer program of claim 40, further comprising a code segment
2	that dynamica	ally sorapes the online scripted interface.
1	42.	The computer program of claim 38, wherein the navigation query is
2	constructed ir	n the format of a database query language.

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l	43. The computer program of claim 38, wherein rendering of the
2	interpretation and the construction of the navigation query are performed, at least in
3	part, on a computing device located locally with the user.
ı	44 The computer program of claim 38, wherein the revdering of the

- interpretation and the construction of a navigation query are performed, at least in 2 part, on a network computing device located remotely from the user. 3
- 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 2 encountered during the constructing of the navigation query.
 - The computer program of claim 45, wherein the deficiencies include 46. unresolved words of the spoken NL request.
 - 47. The computer program of clam 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.
- The domputer program of claim 48, wherein the deficiencies include l existence of more than one data record within the data source responsive to the 2 navigation query. 3
- 50. The computer program of claim 48, wherein the deficiencies include 1 failure to identify a single data record within the data source responsive to the navigation query. 3
- 51. The computer program of claim 38, wherein code segment that solicits additional input displays an option menu. 2
- The computer program of claim 51, wherein the act of selecting from 52. 1 the displayed option menu is performed by speaking. 2

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

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.



Post-It* Fax Note: 7671	Date 4 29 OU pages 7
To Domenic Motab	From K. Elongriu
Co./Dept.	co. SeI Intl.
Phone # 408 - 97/1-4660	Phone # 650-859-6631
Fax 408-971 - 4160	Fax # 650.859-6420

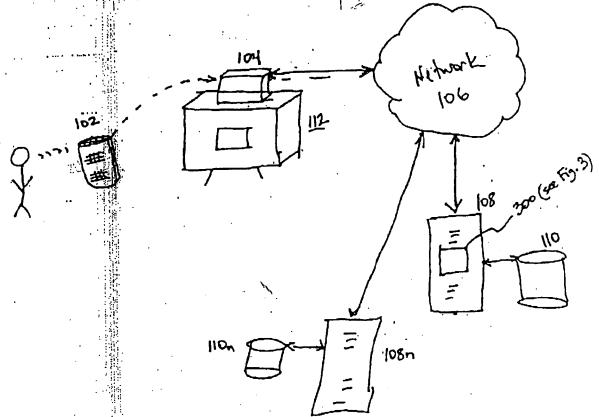


Fig. 1a

650/859 3834

P.02

CASOSEY MESONS

: ____

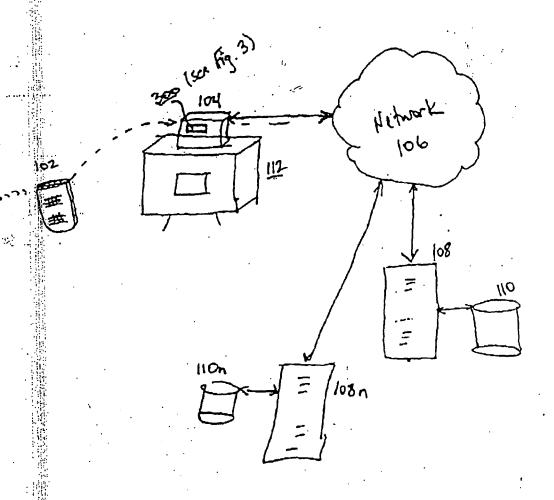


Fig. 10

CER 4050 303/

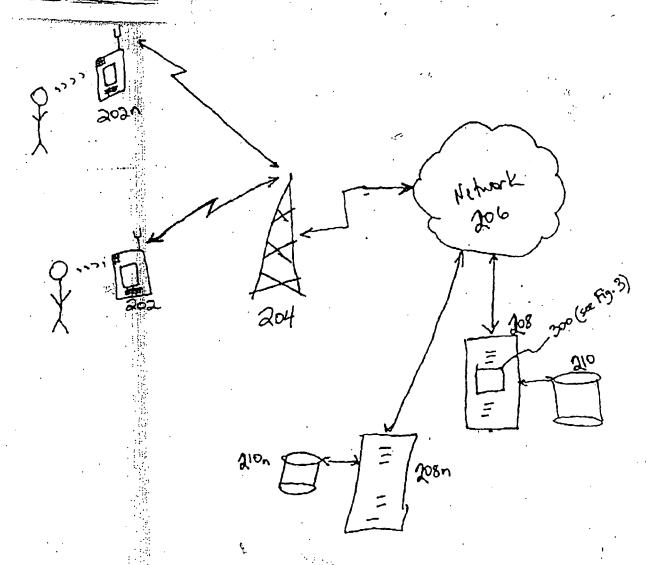


Fig. 2

C50/859 3834

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OSSISSIE OSSIG

659/859 3834

CTCCTTT CETTI

(from step 406, fig.4)

scrape the online scripted form, to extract a input template

520

instartiate the input temphoto, using interpretation of step 404

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(+ step 407, Fg. 4)

Fis. 5

PRINT OF DRAWINGS AS ORIGINALLY FILER

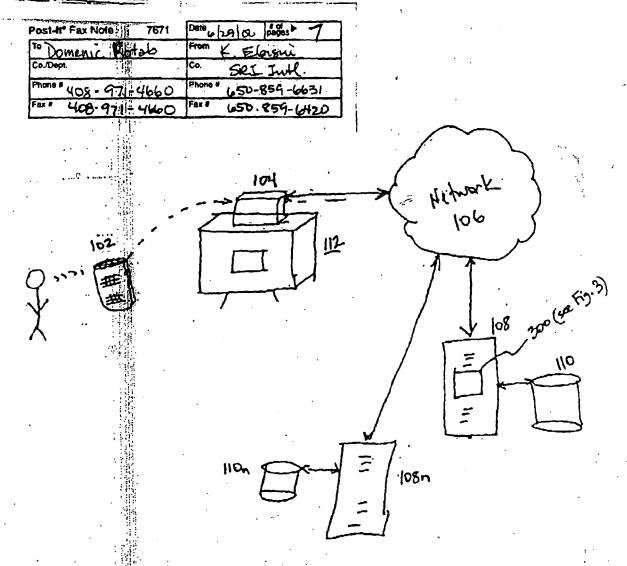
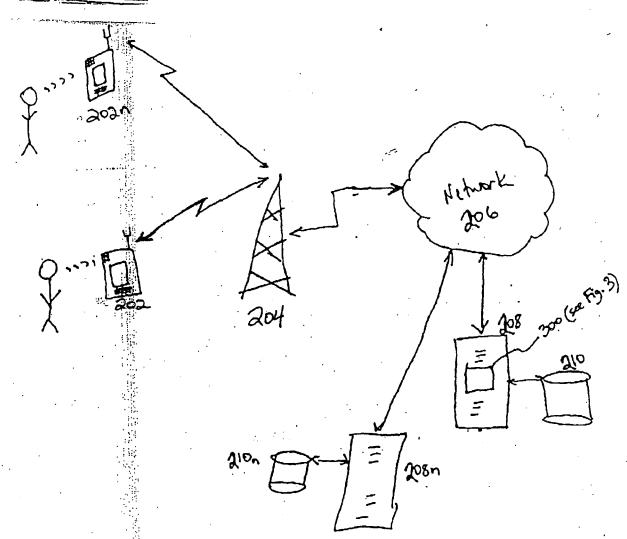


Fig. 1a

650/859 3834

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Fig. 2

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PRINT OF DRAWINGS AS ORIGINALLY FILE

Request faces:... Logic 300

Speech recognition 310

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parper

query comstruction 330

logic 340

logic

Fig. 3

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(from step 406, Fig. 4)

to extract a input template

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instatiate the input temphte, using interpretation of step 404

522

(to step 407, Fg. 4)

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Fig. 6

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TOTAL P.08 P.08

Speech Agent

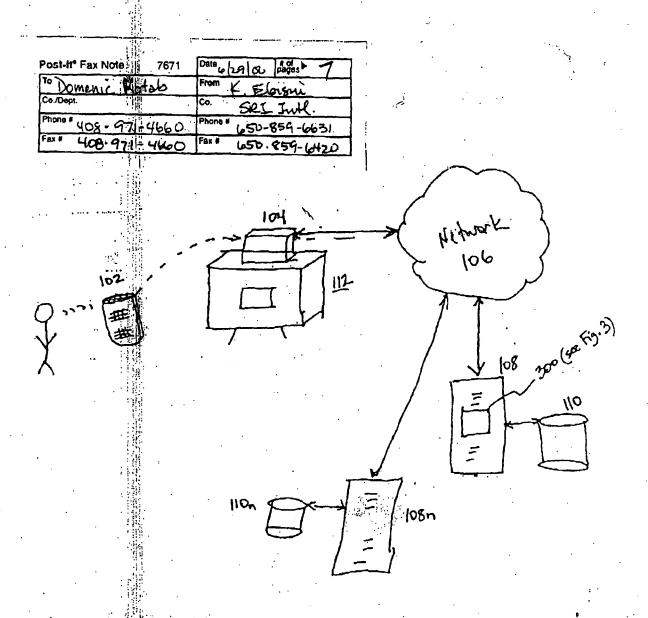


Fig. 1a

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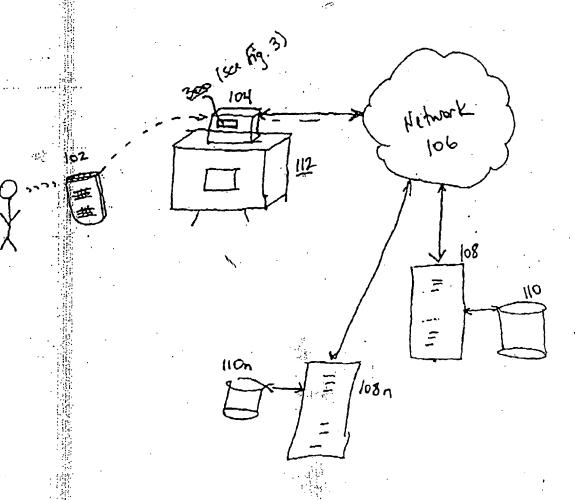


Fig. 15

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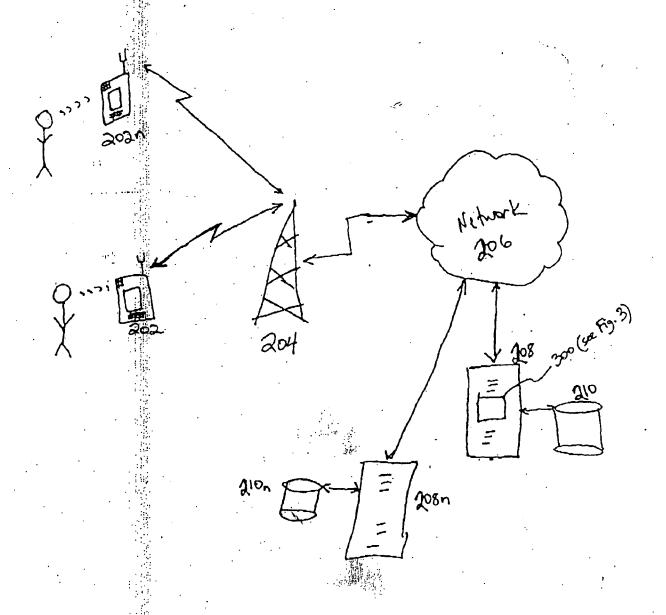


Fig. 2

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Request Precessing logic 300

Speech recognition 310

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Actural language 320

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Query construction 330

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Fig. 3

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Fig.4

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(firm step 406, fig. 4)

The crape the online scripted form,
to extract an input template

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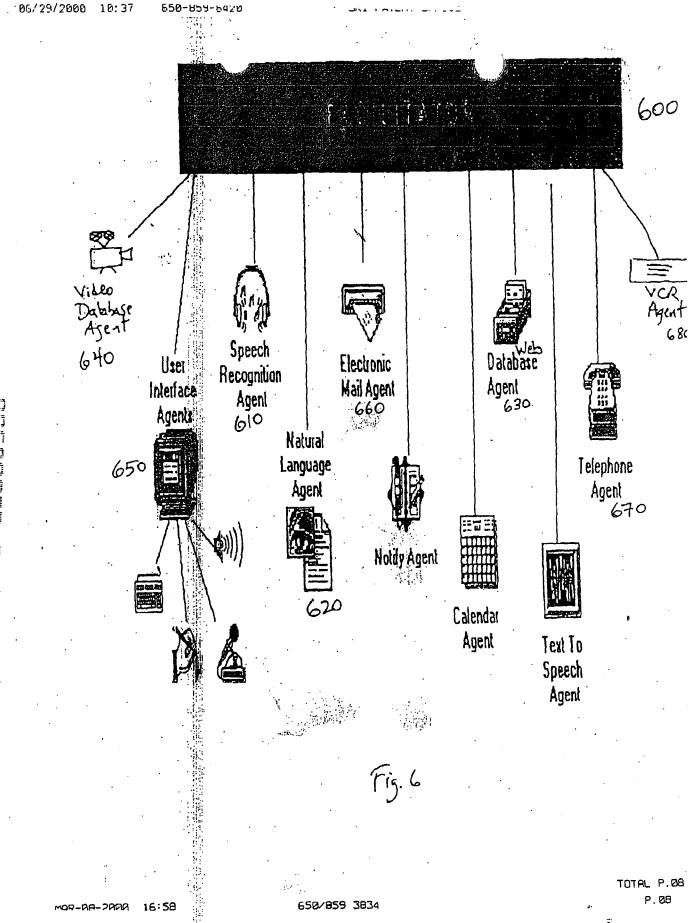
instantiate the input templete, using interpretation of step 404

(to step 407, Fg. 4)

Fig. 5

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650/859 383



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

1-50-0 H2/R

In re the application of

Docket:

Christine HALVERSEN et al.

SRI1P037B

608,872 Application No. 09/524,095

Date: June 30, 2000

Filed: March 13, 2000

For: NAVIGATING NETWORK BASED ELECTRONIC INFORMATION USING SPOKEN

NATURAL LANGUAGE INPUT WITH MULTIMODAL

ERROR FEEDBACK

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 SRI1P037B

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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

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

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.

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

SRI1P037B

2 -

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 THE CLAIMS:

56 82

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

(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.

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

(New) The method of claim?, wherein the step of rendering the interpretation of the spoken request is performed by the mobile information appliance.

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

SRI1P037B

-3-

refining the navigation query, based upon the additiona	l input; and using the refine	ed navigation
query to select a portion of the electronic data source.	A. Committee of the com	

(New) The m

(New) The method of claim, wherein the data link includes a cellular telephone

system

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

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

(New) The method of claim X, wherein the mobile information appliance is a portable computing device.

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

(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.

SRI1P037B

- 4

11 166	10-65	
11	(New) 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. (New) The computer program of claim 10, wherein the rendering of the	
17/2	(New) The computer program of claim 10, wherein the rendering of the	
interpretation	of the spoken request is performed by the mobile information appliance.	
3 18	(New) The computer program of claim 10, further comprising a code segment the	. a t
solicits additi	onal input from the user, including user interaction in a modality different than the	9
original reque	est; a code segment that refines the navigation query, based upon the additional	
input; and a c	ode segment that uses the refined navigation query to select a portion of the	
electronic dat	a source.	
14 19	(New) The computer program of claim 10, wherein the data link includes a	
wireless telep	· \N1 / .	
15,78	(New) The computer program of claim 16, wherein code segments (a)-(d) are	
executed with	respect to multiple users.	
16 74	(New) The computer program of claim 16, wherein the mobile information	
	wireless telephone.	
17.77	(New) The computer program of claim 10, wherein the mobile information	
appliance is a	portable computing device.	
18 73	(New) The computer program of claim 17, wherein the portable computing devi	ice

(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;

SRI1P037B

is a personal digital assistant.

- 5 -

103 (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.

(New) 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.

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

(New) 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.

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

(New) The system of claim 1, wherein the system operates with respect to multiple users.

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

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

SRI1P037B

- 6 -

Petitioner Microsoft Corporation - Ex. 1008, p. 98

27

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

a y

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 sylmitted,

Kevin 1/Zilka Registration No. 41,429

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

SRI1P037B

- 7 -

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.USDID.GOV

APPLICATION NUMBER

FILING/RECEIPT DATE

FIRST NAMED ÁPPLICANT

ATTORNEY DOCKET NUMBER

09/608,872

06/30/2000

Christine Halversen

SRIIp037B

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



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 come 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.

Costomer Service Center

Initial Patent Examination Division (703) 308-1202

PART 3 - OFFICE COPY

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8/31/00



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of

(i) Examiner: Not Assigned

Halverson et al.

(i) Art Unit: 2741

Application No. 09/608,872

(ii) Atty. Docket No. SRI1P037B

Filed: June 30, 2000

(iii) Date: October 30, 2000

For: MOBILE NAVIGATION OF NETWORK-

BASED ELECTRONIC INFORMATION

USING SPOKEN INPUT

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, Waghington, D.C. 20231 on October 30, 2000.

Signed

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. 23% 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 41,42

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

Attorney Docket No. SRJ1P037B

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01/03/1995 8342	650-859-/ ำ	SRI PATENT OFFICE	PAGE 09
NOV 0 2 2000		AND POWER OF ATTOL	
The set	FURURIGINA	L U.S. PATENT APPLICAT	
PRADEMA	dan I banda danlar dan		Attorney's Docket No. SRI1P037
AS a DEIDW-Hamed HIVE	tor, I hereby declare that:		
My residence, post offici	e address and citizenship are	as stated below next to my name.	~. -
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	2. 💢 was filed on	March 13, 2000 as	
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		l on	wanner.
	3. was filed on		34
		Application Serial No.	as
	and was amended		<u></u>
amended by any amendant I acknowledge the duty to 37, CFR § 1.56.	11	, h is material to the examination of this app	plication in accordance with Title
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for patent or inventor's or than the United States, I	ertificate, or § 365(a) of any listed below and have iden	5, United States code, § 119(a)-(d) or § 36: y PCT International application which desi tified below, by checking the box, any to on having a filing date before that of the	ignated at least one country other foreign application for patent or
Prior Foreign Application	on(s)		Priority Benefits Claimed?
(Appl. No.)	(Country)	(Filing Date)	
			∐Yes ∐No
(Appl. No.)	(Country)	(Filing Date)	Г П
		,	Yes No
(Appi. No.)	(Country)	(Filing Date)	
l hereby claim the benefit	under 35 U.S.C. §119(e) of	any United States provisional application(s	i) listed below:
(Application Serial No.)	(Filing D	ate)	

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:

(Filing Date)

Attny Docket No. \$RI1P037

(Application Serial No.)

Page 1 of 3

01/03/1995 01:42	650-859, 20	SRI PATENT OFFICE	PAGE 11
•			
Prior U.S. Application(s)			
		.*	• •
(Application Serial No.)	(Filing Onte	(Status - patented, pending, abandoned)
(Application Serial No.)	(Filing Date)	(Status - patented, pending, abandoned)	
Keith Stephens (Reg. No. Melton (Reg. No. 32,276); (Reg. No. 40,008); Dougis No. P46,327); Stefanie M.	32,632 Brian R. Coleman Raymonid E. Roberts (Reg. S E. Markenzie (Reg. No. 38 Howell (Reg. No. P45,929);	Coleman & Hughes, including Paul L. Hickman (Ra (Reg. No. 39,145); Michael J. Hughes (Reg. No. 29 No. 38,597); Vidya R. Bhakar (Reg. No. 42,323); L 1,955); Michael D. Plimier (Reg. No. 43,404); Rozz and Robert D. Hayden (Reg. No. 42,645) as my price Patent and Trademark Office connected therewith:	,077); Michael E. arry B. Guernsey ald B. Feece (Reg.
Send Correspondence To:	HICKMA P.O. BOX	n Stephens Coleman & Hughes, 1	LLP
Direct Telephone Calls To	: Raymond &	Roberts at telephone number (408) 558-9950	
		outh, under section 1001 of Title 18 of the United Staff the application or any patent issuing thereon. Citizenship: USA	
laventor's signature:	Christin Stalve	USM Date of Signature: 6.16.	00
Residence: (City)	San Jose	(State/Country) Cali	fornia/USA
Post Office Address:	623 Fairorchard Ave	nue, San Jose, California 95125	
Full Name of Second Joint Inventor (if any):	Luc Julia	Citizenship: USA	FRANCE
laventor's signature:	4	Date of Signature: 6.21	
Residence: (City)	Menlo Park	(State/Country) Cali	fornia/USA
Post Office Address:	607 Menio Avenue, M	enle Park, California 94025	,
Full Name of Third Joint inventor (if any):	Dimitris Voussas	Citizenship: <u>Gree</u> c	<u>e</u>
laventor's signature:	A A A A A A A A A A A A A A A A A A A	Date of Signature: 6/16	100
Residence: (City)	Ihassaloniki	(State/Country) Greec	<u>e</u>
Post Office Address:	14 M. Pyrza Street.	Meoi Epivates. Thessaloniki 57019,	<u>Greece</u>
•		•	•

Attny Docket No. SRI1P037

Page 2 of 3

11.47 מבה 17.70 מו:47	658-859-1 N	SRI PATENT OFFICE	PAGE 16
Full Name of Fourth Joint Inventor (if any):	Adam Cheyer	Citizenship: USA	
inventor's signature:	Olen J. Cheyen	Date of Signature: 6/22/0	3
Residence: (City)	Pato Alto	(State/Country) California	/USA

Attny Docket No. SRI1P037

Page 3 of 3

Page 1 of 1



United States Patent and Trademark Office

AND TRADE

APPLICATION NUMBER

FILING/RECEIPT DATE

FIRST NAMED APPLICANT

ATTORNEY DOCKET NUMBER

09/608,872

Christine Halversen

SRIIp037B

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 163, 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.

Customer Service Center

Initial Patent Examination Division (703) 308-1202

PART 2 - COPY TO BE RETURNED WITH RESPONSE

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UNITED STA ÉS DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

COMMISSIONER OF PATENTS AND TRADEMARKS

Washington, D.C. 20231

FIRST NAMED INVENTOR ATTORNEY DOCKET NO. APPLICATION NO. FILING DATE C SRILP037B HALVERSEN 06/30/00 09/608,872 **EXAMINER** TM02/0424 024277 BACKER, F

Kevin J. Zilka PO Box 721030 San Jose CA 95172

PAPER NUMBER ART UNIT

2155

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

		Application No	• • • • • • • • • • • • • • • • • • • •	Applicant(s)	· <u> </u>
		09/608,872	••	HALVERSEN E	U. TAI
	Office Action Summary	Examiner		Art Unit	
_	- The MAILING DATE of this communication	Firmin Backer	shoot with the	2155	ddress
Period fo	or Reply	r appears on the cover	Sheet with the	correspondence a	daress
THE - Exte after - If the - If NO - Failu - Any I	ORTENED STATUTORY PERIOD FOR F MAILING DATE OF THIS COMMUNICAT asions of time may be available under the provisions of 37 (SIX (6) MONTHS from the mailing date of this communicat period for reply specified above is less than thirty (30) days period for reply is specified above, the maximum statutory re to reply within the set or extended period for reply will, by eply received by the Office later than three months after the part of th	ION. FR 1.136 (a). In no event, howers, howers, howers, a reply within the statutory minus and will expire a statute, cause the application.	wever, may a reply be nimum of thirty (30) d SIX (6) MONTHS fro to become ABANDON	timely filed ays will be considered tir the mailing date of this JED (35 U.S.C. & 133)	nely. s communication,
1)🛛	Responsive to communication(s) filed o	n <u>30 June 2000</u> .			
2a) <u></u> ☐	This action is FINAL . 2b)	This action is non-f	īnal.		
3)□	Since this application is in condition for closed in accordance with the practice u				the merits is
Dispositi	on of Claims		•		
4)⊠	Claim(s) 56-82 is/are pending in the app	lication.			
	4a) Of the above claim(s) is/are wi	thdrawn from conside	ation.		
5) 🗌	Claim(s) is/are allowed.				
6)⊠	Claim(s) <u>56-82</u> is/are rejected.				
7) 🗌	Claim(s) is/are objected to.	11 July 1			
8)	Claims are subject to restriction a	and/or election require	ment.		,
Applicati	on Papers		· .		
9)	The specification is objected to by the Ex	aminer. _.			ŧ
10)	The drawing(s) filed on is/are obje	cted to by the Examin	er.		
11)	The proposed drawing correction filed on	is: a) appro	ved b)☐ disar	oproved.	
12)	The oath or declaration is objected to by	the Examiner.			
Priority u	inder 35 U.S.C. § 119		100		
13)	Acknowledgment is made of a claim for fo	oreign priority under 3	5 U.S.C. § 119	(a)-(d) or (f).	
a)[☐ All b)☐ Some * c)☐ None of:				
	1. Certified copies of the priority docu	ments have been reco	eived.		
	2. Certified copies of the priority docu	ments have been rece	eived in Applica	tion No	
* <u>\$</u>	3. Copies of the certified copies of the application from the Internation for the attached detailed Office action for	al Bureau (PCT Rule	17.2(a)).		al Stage
	Acknowledgement is made of a claim for	and the contract of		•	
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16) 🔲 Noti	ce of References Cited (PTO-892) ce of Draftsperson's Patent Drawing Review (PTO-9 mation Disclosure Statement(s) (PTO-1449) Paper			ary (PTO-413) Paper al Patent Application	
.S. Patent and Tr PTO-326 (Re		fice Action Summary		Par	t of Paper No. 4

Application/Control N. ber: 09/608,872

91. E

Art Unit: 2155

Page 1

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.

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Page 2

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).
- 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)

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Application/Control N. per: 09/608,872

Art Unit: 2155

Page 3

- 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).
- 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

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Page 4

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).
- 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).

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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).

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)

- 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

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Art Unit: 2155

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).

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

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

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's 20. 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.

April 9, 2001

TECHNOLOGY CENTER 2100

FO	RM P	TO-892		NT OF COMMERCE ADEMARK OFFICE	SERIAL NO. 09/608,872	GROUP ART UNIT 2155	ATTACHMI TO PAPER	ENT NO.	10
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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 within the time period set in the attached Office communication. 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

APR 3 0 2001 IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT

In re the application of:

Halverson et al.

Application No. 09/608,872

Filed: 06/30/2000

For: MOBILE NAVIGATION OF NETWORK

-BASED ELECTRONIC INFORMATION

USING SPOKEN INPUT

Group Art Unit: 2741

Examiner: Unassigned

Atty. Docket No. SRI1P037B/

44454/03450

Date: April 27, 2001 RECEIVED

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

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.

Attny Dkt No. SRI1P037B/44454/03450

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

Dominic M. Kotab Reg. No. 42,762

MAY 4 - 2001
Technology Center 2100

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

Telephone: (408) 271-2300

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	Form 1439 (Modified)	Atty. Docket No.	Application No.:
AP	r 3 U 2004' I	SRI1P037B	09/608,872
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	(Use Several Sheets if Necessary)	06/30/2000	2741 2155

U.S. Patent Documents	U.S.	Paten	t Document	ts
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Initial	No.	Patent No.	Date	Patentee	Class	class	Date
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7/	В	6,102,030	01/04/00	French- St. George et al.	704	275	04/21/98
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	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 AL	76/11/96
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	K	5,748,974	05/05/98	Johnson	395	759	12/13/94

Foreign Patent or Published Foreign Patent Application

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Other Documents

Examiner	NI	And Title Day Plant (and Laurell) SPalling						
Initial No. Author, Title, Date, Place (e.g. Journal) of Publication								
R Stent, Amanda et al., "The CommandTalk Spoken Dialogue System International								
Moore, Robert et al., "CommandTalk: A Spoken-Language Into Battlefield Simulations", October 23, 1997, SRI International								
	Т	Dowding, John et al., "Interpreting Language in Context in CommandTalk",						
$\langle \chi \rangle$		February 5, 1999, SRI International						
Examiner		Date Considered 9/27/07						

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.

Pg. 1-of 3

ATR 3 0 2001 Elnformation Disclosure
Statement By Applicant

TRADE Use Several Sheets if Necessary)

Atty. Docket No.
SRI1P037B
09/608,872

Applicant:
Halverson et al.
Filing Date:
Group Art Unit:
06/30/2000
2741 2155

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10.	Α.,	.5,729,659	03/17/98	Potter	395	2.79	06/06/95
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	D	5,519,608	05/21/96	Kupiec	364	419.08	1006/24/93
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₩,	F	5,386,556	01/31/95	Hedin et al.	395	600	nolog23192
101	G	5,197,005	03/23/93	Shwartz et al.	364	419	03/18/94/0 03/18/94/0 05/01/89 e r
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		Other Documents
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Initial	No.	Author, Title, Date, Place (e.g. Journal) of Publication
	R	http://www.ai.sri.com/~oaa/infowiz.html, "InfoWiz: An Animated Voice
10		Interactive Information System, May 8, 2000
	S	Dowding, John, "Interleaving Syntax and Semantics in an Efficient Bottom-
10.		up Parser", SRI International
	T	Moore, Robert et al., "Combining Linguistic and Statistical Knowledge
1/20		Sources in Natural-Language Processing for ATIS", SRI International
Examiner		Date Considered 927/02
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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.

Application No.:

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Atty. Docket No.

Form 1449 (Modified)

Pg. 3 of 3

considered. Include copy of this form with next communication to applicant.





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

 v_{i}

MAY 1.7 2001 Technology Center 210

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 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

Attorne *Docket No.: SRI1P037B

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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

Date:

Respectfully submitte

Kevin J. Zilka (Reg. No. 41,42

Dominic Kotab (Reg. No.

Carlton Fields LLP

P.O. Box 721030

San Jose, CA 95172-1030 Telephone: (408) 271-2300

Fax: (408) 275-9579

TPA#1680358.01

Petitioner Microsoft Corporation - Ex. 1008, p. 123

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

GALL 2155 PTO/SB/21 (08-00)

		Application Number	09/608,872			
TRANSMITTA	VL -	Filing Date	une 30, 2000۔			
FORM		First Named Inventor	HALVERSON			
(to be used for all correspondence af	er initial filing)	Group Art Unit	2155			
EMALE	•	Examiner Name	F. BACKER			
otal Number of Pages in This Submis	sion	Attorney Docket Number	SRI 1 P 037B			
	ENCL	OSURES (check all that apply)				
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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. **Application Number** 09/608,872 RANSMITTAL **Filing Date** June 30, 2000 **FORM** First Named Inventor **HALVERSON** for all correspondence after initial filing) **Group Art Unit** 2155 Examiner Name F. BACKER Total Number of Pages in This Submission Attorney Docket Number SRI 1 P 037B ENCLOSURES (check all that apply) After Allowance Communication to Assignment Papers (for an Application) Fee Transmittal Form Group Appeal Communication to Board of Fee Attached ☐ Drawing(s) Appeals and Interferences Appeal Communication to Group Amendment / Response Licensing-related Papers (Appeal Notice, Brief, Reply Brief) After Final Petition Proprietary Information Petition to Convert to a Affidavits/declaration(s) Status Letter Provisional Application Power of Attorney, Revocation Change of Correspondence Address Other Enclosure(s) X Extension of Time Request (please identify below): Terminal Disclaimer Express Abandonment Request Request for Refund Information Disclosure Statement CD, Number of CD(s) ☐ Certified Copy of Priority Remarks Document(s) 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 KIN-WAH TONG Individual name 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:

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September 19, 2001

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SUBMITTED BY		4 446		Con	mplete (if applicable)
Name (Print/Type)	KIN-WAH TONG	Registration No. Attorney/Agent)	39,400	Telephone	(732) 530-9404
Signature	2.21	15		Date	SEPTEMBER 19, 2001

SUBTOTAL (2)

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SUBTOTAL (3)

(\$) 195.00

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Filing Date	June 30, 2000	/	Š
First Named Inventor	HALVERSON	SEP 2 1 2000	٤
Examiner Name	F. BACKER	<u>H</u>	į
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TOTAL AMOUNT OF PAYMENT 195.00 FEE CALCULATION (continued) METHOD OF PAYMENT (check one) 3. ADDITIONAL FEES The Commissioner is hereby authorized to charge indicated fees and credit any over payments to: Fee (\$) Fee Code Fee Description (\$) Paid 20-0782 205 Surcharge - late filing fee or oath 105 130 65 Number 25 Surcharge - late provisional filing fee 127 227 50 or cover sheet. Non-English specification 139 130 139 130 For filing a request for reexamination 147 2.520 147 2,520 Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17 Requesting publication of SIR prior to 920 112 920 112 Examiner action Applicant claims small entity status. See 37 CFR 1.27 Requesting publication of SIR after 113 1,840 113 1,840* Examiner action Ø Payment Enclosed: 115 110 215 55 Extension for reply within first month 116 390 216 195 Extension for reply within second 195.00 Check ☐ Credit card □ Other 117 ลดด 217 445 Extension for reply within third month FEE CALCULATION 118 1,390 218 695 Extension for reply within fourth BASIC FILING FEE 128 1,890 228 945 Extension for reply within fifth month Entity Entity Small Large Fee Description 119 310 219 155 Notice of Appeal (\$) Fee Paid Code (\$) Code 120 310 220 155 Filing a brief in support of an appeal 101 710 201 Utility filing fee 121 270 221 135 Request for oral hearing 320 206 160 Design filing fee Petition to institute a public use 138 1,510 138 1,510 107 490 207 245 Plant filing fee proceeding 108 710 208 355 Reissue filing fee 140 110 240 55 Petition to revive - unavoidable Petition to revive - unintentional 150 214 75 Provisional filling fee 141 1,240 241 620 Utility issue fee (or reissue) 142 1,240 242 620 SUBTOTAL (1) (\$) 0 220 Design issue fee 143 440 243 Plant issue fee 600 144 244 300 2. EXTRA CLAIM FEES Petitions to the Commissioner 122 130 122 130 Petitions related to provisional Paid Claims below 123 123 130 130 = 0 Total Claims -20** ٦x applications Submission of Information Disclosure 126 0 126 180 180 0 Recording each patent assignment х 0 581 40 581 40 per property (times number of roperties) Filing a submission after final rejection (37 CFR § 1.129(a)) Entity Small Entity Large 146 710 246 355 Fee {\$} Fee (\$) Fee Code Fee Code Fee Description For each additional inve 710 249 355 149 203 examined (37 CFR § 1.129(b)) 103 18 102 80 202 40 Independent claims in excess of 3 179 710 279 Request for Continued Examination (RCE) Multiple dependent claim, if not paid 104 270 204 135 169 900 169 900 Request for expedited examination of a design application ** Reissue independent claims over 40 109 80 209 original patent ** Reissue claims in excess of 20 and 110 18 210 over original patent Other fee (specify) SUBTOTAL (2) (\$) 0 *Reduced by Basic Filing Fee Paid SUBTOTAL (3) (\$) 195.00 or number previously paid, if greater, For Reissues, see above

SUBMITTED BY		·		C	omplete (if applicable)
Name (Print/Type)	KIN-WAH TONG	Registration No. Attorney/Agent)	39,400	Telephone	(732) 530-9404
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Petitioner Microsoft Corporation - Ex. 1008, p. 128

09/608,872



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

#12 LD-01-01

PATENT APPLICATION

Filed: June 30, 2000

Applicant: Halverson et al.

Case: SRI1P037B

Serial No.: 09/608,872

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

SIR:

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

λ.

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 reguest;
 - (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) <u>transmitting the selected portion of the electronic data source from the network server to the mobile information appliance of the user</u>. (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) <u>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.</u> (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) <u>a mobile information appliance operable to receive a spoken request for desired information from the user;</u>
 - (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 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. 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.

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.

9/19/01

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

Respectfully submitted,

Kin-Wah Tong, Attorney

Reg. No. 39,400 (732) 530-9404

Patent and Trademark Office: U.S. & MENT OF COMMEDCE

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	PETITION FOR EXTENSION OF T	IME UNDER 37 CF	R 1.136(a)	Do:ef Number (Optional) SRI 1P037B	
	OIPE	In re Application of	HALVERSON, et	al	
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	SEP 2 1 2001 10	For Mobile Navigation of Network-Based Electronic Information Using Spoken Input			
	RADEWARK OF	Group Art Unit 2155	Examiner F. Backer		
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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.

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Petitioner Microsoft Corporation - Ex. 1008, p. 136

#10 10-01-01

PETITION FOR EXTENSION OF 1	TIME UNDER 37 CF	R 1.136(a)	Docket Number (Optional) SRI 1P037B	
	In re Application of	HALVERSON, e	t al	
OIPE	Application Number	09/608,872	Filed June 30, 2000	
\$ 21 min 5	For Mobile Navigation of Network-Based Electronic Information Using Spoken Input			
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Five months (37 CF	R 1.17(a)(5))		\$	
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). A check in the amount of the fee is enclosed. The Commissioner is hereby authorized to charge fees in this application for count. 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. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96). A attorney or agent under 37 CFR 1.34(a). Registration number if acting under 37 CFR 1.34(a).				
be included on this form. Provid	le credit card inform	ation and author	ization on PTO-2038.	
September 19, 2001			- Wat la	
Date			Signature	
		KIN-WA	AH TONG, Reg. No. 39,400	
		Ту	ped 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.

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.



IN THE UNITED STATES

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

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

CERTIFICATE UNDER 37 C.F.R. § 3.73(B)

RI 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.

Date: 9/11/0/

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

EDWARD E. DAVIS, Assistant Secretary STRVEN WRINER, NICK

AECENED 2.60 2.00 Technology Center 2.100

ASSIGNMENT OF PATENT APPLICÁTIO.

(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:

- Sell(s), assign(s) and transfer(s) to <u>SRI International</u>, 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: / Typed Name:	Christine Halverson	Date:	6-16-00.
2)	Signature: Typed Name:	Luc Julia	Date:	
3)	Signature: Typed Name:	Dimitris Voutsas	Date:	6/16/00
4)	Signature: Typed Name:	Adam Cheyer Chey	Date:	6/22/00

Attov Docket No. SRI1P037

ASSIGNME. IT OF PATENT APPLICATIO

(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

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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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- 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: Typed Name:	Christine Halverson	Adalvein-	Date:	6-16-00.
2)	Signature: Typed Name:	Luc Julia		_ Date:	6.20.00
3)	Signature: Typed Name:	Dimitris Voutsas	unce	_ Date:	6/16/00
4)	Signature: Typed Name:	Adam Cheyer		_ Date:	

Attny Docket No. SRI1P037

ASSIGNMENT OF PATENT APPLICATION OF

(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 <u>SRI International</u>, 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.

Date: 6-16-00. 1) Signature: Typed Name: Christine Halverson 2) Signature: Date: Typed Name: Luc Julia Date: 6/16/00 3) Signature: Typed Name: 4) Signature: Date: Typed Name: Adam Cheyer

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

Petitioner Microsoft Corporation - Ex. 1008, p. 142

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



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

APPLICATION NUMBER FILING DATE FIRST NAMED APPLICANT ATTY DOCKET NO/TITLE

09/608;872 06/30/2000 Christine Halversen SRIIp037B

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* OC00000006829467*

THOMASON, MOSER & PATTERSON, LLP 595 SHREWSBURY AVENUE SUITE 100 182 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 D JOHNSON 2100 7033085229

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APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO /TITLE
09/608,872	06/30/2000	Christine Halversen	SRIIp037B

confirmation No. 2382 * 0C000000006829442*

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

 $\partial \mathcal{G}_{\zeta}^{\lambda}$

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).

2100 7033085229

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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 \Box SRILP037B **EXAMINER** TM02/1010 THOMASON, MOSER & PATTERSON, LLP ART UNIT PAPER NUMBER 595 SHREWSBURY AVENUE SUITE 100 SHREWSBURY NJ 07702 2155 DATE MAILED:

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

Commissioner of Patents and Trademarks

10/10/01

PTO-90C (Rev. 2/95) *U.S. GPO: 2000-473-000/44602 1- File Copy

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.	Application No.	Applicant(s)
Office Action Summary	09/608,872	HALVERSEN ET AL.
Office Action Summary	Examiner	Art Unit
	Firmin Backer	2155
The MAILING DATE of this communication app Period for Reply	ears on the cover sheet with the co	orrespondence address
A SHORTENED STATUTORY PERIOD FOR REPL THE MAILING DATE OF THIS COMMUNICATION. - Extensions of time may be available under the provisions of 37 CFR 1. 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 rep - If NO period for reply is specified above, the maximum statutory period - Failure to reply within the set or extended period for reply will, by statut - Any reply received by the Office later than three months after the mailin earned patent term adjustment. See 37 CFR 1.704(b). Status	136 (a). In no event, however, may a reply be till by within the statutory minimum of thirty (30) day will apply and will expire SIX (6) MONTHS from a cause the application to become ABANDONE	mely filed s will be considered timely. the mailing date of this communication. D (35 U.S.C. § 133).
1) Responsive to communication(s) filed on 26	September 2001 .	
	nis action is non-final.	
3) Since this application is in condition for allow closed in accordance with the practice under	ance except for formal matters, p Ex parte Quayle, 1935 C.D. 11, 4	rosecution as to the ments is 453 O.G. 213.
Disposition of Claims	· . *	
4)⊠ Claim(s) <u>56-82</u> is/are pending in the applicati	on.	·
4a) Of the above claim(s) is/are withdra	wn from consideration.	
5) Claim(s) is/are allowed.		
6)⊠ Claim(s) <u>56-82</u> is/are rejected.		
7) Claim(s) is/are objected to.	a de la companya de la companya de la companya de la companya de la companya de la companya de la companya de	
8) Claims are subject to restriction and/o	or election requirement	
Application Papers		
9) The specification is objected to by the Examir	ner.	
10) The drawing(s) filed on is/are objected	to by the Examiner	
11) The proposed drawing correction filed on	is: a)□ approved b)□ disap	proved.
12) The oath or declaration is objected to by the f	Examiner.	ę
Priority under 35 U.S.C. § 119		
13) Acknowledgment is made of a claim for foreign	n priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:		, , , , ,
1. ☐ Certified copies of the priority documer	its have been received.	
2. Certified copies of the priority document		tion No.
3. Copies of the certified copies of the pri	ority documents have been receiv ureau (PCT Rule 17.2(a)).	red in this National Stage
* See the attached detailed Office action for a lis		
14) Acknowledgement is made of a claim for don	nestic priority under 35 U.S.C. § 1	19(e).
Attachment(s)		
15) Notice of References Cited (PTO-892)		ary (PTO-413) Paper No(s)
 16) Notice of Draftsperson's Patent Drawing Review (PTO-948) 17) Information Disclosure Statement(s) (PTO-1449) Paper No(s 	· <u> </u>	al Patent Application (PTO-152)
U.S. Patent and Trademark Office PTO-326 (Rev. 01-01) Office	Action Summary	Part of Paper No. 4

Application/Control Number 39/608,872

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Page 1

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 <u>cannot</u> 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.

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Page 2

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).
- 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 **河南部** (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)

- As per claim 57, 58, 62-64, Levin et al teach a method of fendering 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).
- 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

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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).
- 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).

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- 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).
- 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)
- 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

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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.

Application/Control Number: 09/608,872

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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

Art Unit: 2155

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 SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

TELEFAX COVER SHEET

MOSER, PATTERSON & SHERIDAN GOOD

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



******************************** 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 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:

CERTIFICATE OF TRANSMISSION UNDER 37 GER. \$1.6

X Transmittal Letter (2 copies)

dated <u>January 10, 2002</u>

Fee Transmittal (2 copies)

Deposit Account Transaction

X Facsimile Transmission Certificate

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Commissioner for Patents, Box AP, Washington,	DC 20231 on January 10, 2002
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Linda DeNardi	Linda Ale Na was January 10, 200
Name of person signing this certificate	Signature and date

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

Petition

Priority Document

X Response Under 37 CFR 1:116

Drawings (___

Disclosure Statement & PTO-1449

__ sheets) informal

		Applica	tion Number	09/608,872	
TRANSMITTAL		Filing ()ate	June 30, 2000	
FORM		First N	amed inventor	HALVERSON	
(to be used for all correspondence after in	itial filing)	Group	Art Unit	.2155	
•			er Name	F. BACKER	
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Date January 10, 2001			- Jun		

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MOSER PATTERSON SHERILAN

09/608,872

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION

RECEIVED

Applicant: Halverson et al.

JAN 1 @ 2002

Case: SRI1P037B

Technology Center 2100

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

SIR:

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.

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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:

- (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 pavigation 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

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 appllance 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

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 <u>not</u> implemented in view of the cited prior art. In fact, Applicants take the position that the scope of the independent claims did <u>not</u> 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

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,

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

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

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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
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595 SHREWS SUITE 100	BURY AVENUE			BACKER,	FIRMIN
SHREWSBUF	RY, NJ 07702	•		ART UNIT	PAPER NUMBER
				2155	15
		,		DATE MAILED: 01/16/2002	<u>j</u>

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

PTO-90C (Rev. 07-01)

	Application No.	Applicant(s)
Intonvious Summans	09/608,872	HALVERSEN ET AL.
Interview Summary	Examiner	Art Unit
·	Firmin Backer	2155
All participants (applicant, applicant's representative, PTC	personnel):	
1) <u>Firmin Backer</u>	(3)Kin-Wah Tong.	
2) <u>Ario Etienne</u> .	(4)	
Date of Interview: 08 January 2002.		
Type: a)⊠ Telephonic b)□ Video Conference c)□ Personal [copy given to: 1)□ applicant	2) applicant's representati	ve]
Exhibit shown or demonstration conducted: d) Yes If Yes, brief description:	e) No.	
Claim(s) discussed: <u>56</u> .		
dentification of prior art discussed: 6,173,279.		
agreement with respect to the claims f) was reached	g)☐ was not reached. h)	□ N/A.
eached, or any other comments: Applicant argues that the should be withdrawn. Applicant argues that the prior art far aspecially the use of wireless communication A fuller description, if necessary, and a copy of the amenallowable, if available, must be attached. Also, where no	dils to teach all the limitations of the diments which the examiner a copy of the amendments that	of the inventive concept greed would render the claim
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i) It is not necessary for applicant to provide a schecked). Unless the paragraph above has been checked, THE FORMUST INCLUDE THE SUBSTANCE OF THE INTERVIEW action has already been filed, APPLICANT IS GIVEN ON STATEMENT OF THE SUBSTANCE OF THE INTERVIEW	RMAL WRITTEN REPLY TO V. (See MPEP Section 713.0 E MONTH FROM THIS INTER	THE LAST OFFICE ACTION 4). If a reply to the last Office RVIEW DATE TO FILE A
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR		ATTORNEY DOCKET NO.	CONFIRMATION NO.
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595 SHREWSE SUITE 100	BURY AVENUE			BACKER,	FIRMIN
SHREWSBUR	Y, NJ 07702	•		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. ()7-()1)

	Application No.	Applicant(s)
	09/608,872	HALVERSEN ET AL.
Advisory Action	Examiner	Art Unit
	Firmin Backer	2155
The MAILING DATE of this communication ap		correspondence address
THE REPLY FILED 17 January 2002 FAILS TO PLACE Therefore, further action by the applicant is required to final rejection under 37 CFR 1.113 may only be either: (condition for allowance; (2) a timely filed Notice of Appe	avoid abandonment of this applica (1) a timely filed amendment which	ation. A proper reply to a hplaces the application in
PERIOD FOR F	REPLY [check either a) or b)]	
a) The period for reply expires 3 months from the mailing date of this no event, however, will the statutory period for reply expire ONLY CHECK THIS BOX WHEN THE FIRST REPLY W. 706.07(f). Extensions of time may be obtained-under 37 CFR 1.136(a). The have been filed is the date for purposes of determining the period	s Advisory Action, or (2) the date set forth re later than SIX MONTHS from the mailing AS FILED WITHIN TWO MONTHS OF THE the date on which the petition under 37 CF	g date of the final rejection. HE FINAL REJECTION. See MPEP R 1.136(a) and the appropriate extension
ee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of (2) as set forth in (b) above, if checked. Any reply received by the O imely filed, may reduce any earned patent term adjustment. See 37 1. A Notice of Appeal was filed on Appellant	office later than three months after the mail 7 CFR 1.704(b).	ling date of the final rejection, even if
37 CFR 1.192(a), or any extension thereof (37 C	FR 1.191(d)), to avoid dismissal o	
2. The proposed amendment(s) will not be entered	because:	•
(a) they raise new issues that would require furt	·	see NOTE below);
(b) they raise the issue of new matter (see Note		
(c) they are not deemed to place the application issues for appeal; and/or		
(d) they present additional claims without cance	eling a corresponding number of fi	inally rejected claims.
NOTE: <u>See Continuation Sheet</u> .		
Applicant's reply has overcome the following reject	ction(s):	•
4. Newly proposed or amended claim(s) wou canceling the non-allowable claim(s).	ld be allowable if submitted in a se	eparate, timely filed amendment
5. ☐ The a) ☐ affidavit, b) ☐ exhibit, or c) ☐ request for application in condition for allowance because:	or reconsideration has been consi	dered but does NOT place the
6. The affidavit or exhibit will NOT be considered be raised by the Examiner in the final rejection.	ecause it is not directed SOLELY t	to issues which were newly
7. For purposes of Appeal, the proposed amendme explanation of how the new or amended claims		
The status of the claim(s) is (or will be) as follows	S:	•
Claim(s) allowed:		
Claim(s) objected to:		
Claim(s) rejected: <u>56-82</u> .	and the second second	
Claim(s) withdrawn from consideration:		
8. The proposed drawing correction filed on	is a)☐ approved or b)☐ disapp	proved by the Examiner.
9. Note the attached Information Disclosure Statem	nent(s)(PTO-1449) Paper No(s)	·
10. Other:	. 1	
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•		·

Continuation Sheet (PTO-303)

72<u>.</u>

Application No. 09/608,872

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

MOSER, PATTERSON & SHERIDAN, LLP

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

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 6 PAGES INCLUDING THIS SHEET Assistant Commissioner of Patents TO: 703-746-7238 FAX NO.: FROM: Kin-Wah Tong February 8, 2002 DATE: Senal No. 09/608,872 Filed: June 30, 2000 MATTER: DOCKET NO .: _ **SRI 1P037B** HALVERSON, et al APPLICANT: The following has been received in the U.S. Patent and Trademark Office on the date of this facsimile: X RCE Transmittal Letter Petition Disclosure Statement & PTO-1449 X Fcc Transmittal (2 copies) Deposit Account Transaction Priority Document _sheets) informal Drawings (_ Facsimile Transmission Certificate X Petition for Extension of Time (2 copies) 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

Signature and date

Received from < 732 530 9808 > at 2/8/02 3:49:42 PM [Eastern Standard Time]

Linda DeNardi
Name of person signing this certificate

02/08/02 15:48 FAX 732 530 9800

MOSER PATTERSON SHERIDAN

Under the Paperwork Reduction Act of 1985, no persons are required to resp

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

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. Submissio	on required under 37 C.F.R. § 1.114				
a. 🛛 Previo	ously submitted				
	onsider the amendment(s)/reply under 37 C.F.R. ny unentered amendment(s) referred to above will be e		sly filed on <u>1/10/02</u>	,	
	onsider the arguments in the Appeal Brief or Rep	ly Brief previous	ly filed on	/	
b, Enclo	şed .				
	mendment/Reply				
	fidavit(s)/Declaration(s)		•		
	formation Disclosure Statement (IDS)				
	ther				
2. Miscellaneo	us				
	ension of action on the above-identified application				
	od ofmonths. (Period of suspension shall not	exceed 3 months;	Fee under 37 C.F.R. § 1	.17(I) required)	
b. 🛛 Other	Extension Request and Fee Transmittel 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.		•
	Director is hereby authorized to charge the following sit Account No. <u>20-0782</u>	ng fees, or credl	t any overpayments, t	0	
i, 🛛 Ri	CE fee required under 37 C.F.R. § 1.17(e)	- }:	. •		
ii. 🔯 E	dension of time fee (37 C.F.R. §§ 1.136 and 1.17)				
<u>iii.</u> 🗆 O	-1-0-1		: 315		٠
b. 🔲 Chec	k in the amount of \$ enclosed				
c. 🔲 Paym	ent by credit card (Form PTO-2038 enclosed)			· · · · · · · · · · · · · · · · · · ·	
	SIGNATURE OF APPLICANT, ATTO	RNEY, OR AGE	NT REQUIRED		
Name (Print /Type)	KIN-WAH TONG	Registration N	o. (Attorney/Agent)	39,400	·
Signature	20/1/2	Date	February 8, 2002		
	ماسنو				

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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U.S. Palent and Tradamark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no person PETITION FOR EXTENSION OF TI			Docket Number (Optional) SRI 1P037B
	In re Application of	HALVERSEN	
Ţ	Application Number	09/808,872	Filed June 30, 2000
	For Mobile Naviga	ion of Network-B ing Spoken Input	
	Group Art Unit 2155	Examiner F. Backer	
This is a request under the provision	s of 37 CFR 1.136(a	to extend the pe	niod for filing a
response in the above identified app	•		
The requested extension and approp (check time period desired):	riate non-small-entit	y fee are as follov	NS .
	1.17(a)(1))		\$ <u>110.00</u>
☐ Two months (37 CFR	1.17(a)(2))		· 5
☐ Three months (37 CF	R 1.17(a)(3))		· S
Four months (37 CF)	R 1.17(a)(4))		\$
Five months (37 CFF	(1.17(a)(5))		\$
☐ The Commissioner has alrea application to a Deposit Accommissioner is hereby or credit any overpayment, I have enclosed a duplicate. ☐ am the ☐ applicant/inventor. ☐ assignee of record of the Statement under 37 Cimple attorney or agent of record attorney or agent under Registration number it act	ount. y authorized to charge to Deposit Account N copy of this sheet. e entire interest. See FR 3.73(b) is enclass ord. 37 CFR 1.34(a).	e any fees which lumber <u>20-0762</u> 37 CFR 3.71 ad. (Form PTO/S	may be required,
WARNING: information on this form be included on this form. Provide	orm may become p	ıblic. Credit car	d Information should not prization on PTO-2038.
February 8, 2002	•	•	1/1/2/2
Date	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Signature
	·		KIN-WAH TONG
•	.):	T	yped or printed name
NOTE: Signatures of all the inventors or assigneed forms if more than one signature is required, see to	s of record of the entire inteller	erest or their réprésér	ntative(s) are required. Submit mutilple
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.

U.S. Patent C Under the Paperwork Reduction Act of 1985, no persone are required to respond to a collect	
PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1	Docket Number (Optional) SRI 190378
In re Application of HA	LVERSEN
Application Number 09/	608,872 Filed June 30, 2000
	of Network-Based Electronic
Information Using Group Art Unit Ex	sminer
2155F.	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 fer (check time period desired):	e are as follows
☑ One month (37 CFR 1.17(a)(1))	\$ <u>110.00</u>
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 1.2' above is reduced by one-haif, and the resulting fee is 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 an or credit any overpayment, to Deposit Account Number I have enclosed a duplicate copy of this sheet. I am the applicant/inventor. assignee of record of the entire interest. See 37 (Statement under 37 CFR 3.73(b) is enclosed. (Statement under 37 CFR 1.34(a). Registration number if acting under 37 CFR 1.34(b). WARNING: Information on this form may become public be included on this form. Provide credit card information	arge fees in this y fees which may be required, per 20-0782 CFR 3.71 Form PTO/SB/96).
	11/11/11
February 8, 2002	LANG A
Date.	Signature
· box	KIN-WAH TONG
`	Typed or printed name
NOTE: Signatures of all the inventors or assignees of record of the entire interest of orms if more than one signature is required, see below.	or their representative(s) are required. Submit multiple
Total offorms are submitted.	Ket t

Burden Hour Statement: This form is estimated to take 0.1 hours to complete. Thrie 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. Parent and Tradement Office, Washington, OC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Parents Washington DC 20231.

					- ·	
FEE TRANSMITTAL	<u></u>			1	Complete If Known	
		Application Number 09/808,872				
for FY 2002	Filing Date June 30, 2000					
	First Named Inventor Halversen					
Patent foes are subject to ennual revision.	Examiner Name F. Backer					
	Group / Art Unit 2165					
TOTAL AMOUNT OF PAYMENT (\$) 425	Attome			SRI	1P037B	
	Autority	, 500	CELITO.			
METHOD OF PAYMENT (check one) The Commissioner is hereby authorized to charge	3 ADDI	TIONA	L FEES	FEE	CALCULATION (continued)	
1. Sindicated fees and credit any over payments to:	. 1	Large Entity		Small Entity		
Deposit	Fee	Fee	Fee	Fee	Fee Description	Fee
Account 20-0782 -	Code 105	(\$) 130	Code 205	(\$) 65 ·	Surcharge - late filing fee or oath	Paid
	127	50	227	25	Surcharge - late provisional filing fee	
Deposit Account	139	130	139	130	or cover sheet. Non-English specification	
Name		2,520	147	2,520	For filing a request for reexamination	
☐ Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17		920-	112	920*	Requesting publication of SIR prior to	
Applicant claims small entity status. See 37 CFR 1.27	113	1,840*	113	1,840	Exeminer action Requesting publication of SIR after Examiner action	
2. Payment Enclosed:	115	110	215	55	Extension for reply within first month	55.00
☐ Check ☐ Credit card ☐ Money ☐ Other	116	400	216	200	Extension for reply within second month	
Order FEE CALCULATION	117	920	217	460	Extension for reply within third month	
1. BASIC FILING FEE	118	1,440	218	720	Extension for reply within fourth month	
Largo Entity Small Entity	128	1,960	228	980	Extension for raply within fifth month	
Fee Fee Fee Fee Description		320	219	160	Notice of Appeal	
Code (\$) Code (\$) Fee Paid 101 740 201 370 Utility (illing fee		320		160	Filing a brief in support of an appeal	
101 740 201 370 Utility filing fee 106 330 206 185 Design filing fee	121	260	221	140	Request for oral hearing	
107 510 207 255 Plant filing fee	138	1,510	138	1,510	Petition to institute a public use proceeding	
108 740 208 370 Relssue filing fee	140	110	240	55	Petition to revive – unavoidable	
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SUBTOTAL (1) (\$) 0		1,280		640	Utility issue fee (or relssue)	
		460 620		230 310	Design issue fee Plant issue fee	
EXTRA CLAIM FEES Extra Fee from Fee		130	122	130	Petitions to the Commissioner	
Claims below Paid	123	50	123	50	Processing fee under 37 CFR 1.17 (q)	
Total Claims	126	180	126	180	Submission of Information Disclosure Strnt	
	581	40	581	40	Recording each patent assignment per property (times number of properties))
Large Entity Small Entity	146	740	246	370	Filing a submission after final rejection (37 CFR § 1.129(a))	
Fee Fee Fee Fee Gode (\$) Code (\$) Fee Description	149	740	249	370	For each additional invention to be examined (37 CFR § 1.129(b))	
103 18 203 9. Claims in excess of 20 102 84 202 42 Independent claims in excess of 3	179	740	279	370	Request for Continued Examination (RCE)	370.00
104 280 204 140 Multiple dependent claim, if not paid	169	900	169	900	Request for expedited examination	\vdash
109 84 209 42 "Reissue Independent claims over original patent					of a design application	1 1
110 16 210 9 ** Reissue claims in excess of 20 and over original patent	Other fee	speci	(y)			-
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or number previously paid, if greater; For Reissuse, see above	*Reduce	d by Be	asic Filing	Fea P	aid SUBTOTAL (3) (\$) 42	5
SUBMITTED BY	;				Complete (If applicable)	
Name (Print/Type) KIN-WAH TONG Registration No. Attorney.	/Agent)	39,	400		Telephone (732)530-9404	

SUBMITTED BY				Co	mptele (If applicable)	
Name (Print/Type)	KIN-WAH TONG	Registration No. Attorney/Agent)	39,400	Telephone	(732)530-9404	
Signature	2.6	12 /		Date	FEBRUARY 8, 2002	

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United States Patent and Trademark Offici

UNITED STATES DEPARTMENT OF COMMERCE United States Patent and Trademark Office Adjusted September of Commerce of Commerce Workington, 2023.

APPLICATION NO. FILING DATE FIRST NAMED INVENTOR STTORNEY 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

EXA	AMINER		
BACKE	BACKER, FIRMIN		
ART UNIT	PAPER NUMBER		
2155	10		

•

DATE MAILED: 02/19/2002

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

PTO-90C (Rev. 07-01)

		Application No.		Applicant(s)					
	·	,			- 41				
Offi	ce Action Summary	09/608,872	<u> </u>	HALVERSEN ET	AL.				
		Examiner		Art Unit					
		Firmin Backer		2155	** *				
The MA Period for Reply	ILING DATE of this communication	appears on the covers	sheet with the co	rrespondence ac	ldress				
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)⊠ Respo	nsive to communication(s) filed or	n <u>08 February 2002</u> .							
<u> </u>	•	This action is non-fi	nal.						
	this application is in condition for a in accordance with the practice u				the merits is				
Disposition of C	laims				•				
4)⊠ Claim(s) <u>56-82</u> is/are pending in the app	ication.							
4a) Of th	ne above claim(s) is/are wi	hdrawn from considera	ation.						
5)☐ Claim(s) is/are allowed.			٠					
6)⊠ Claim(s) <u>56-82</u> is/are rejected.		***						
7) Claim(s) is/are objected to.								
8) Claims	are subject to restriction a	ind/or election requirer	ment.						
Application Pape	ers	•	•						
9)∏ The spe	ecification is objected to by the Ex	aminer.							
10)□ The dra	wing(s) filed on is/are obje	cted to by the Examine	er. jog						
11)☐ The pro	posed drawing correction filed on	is: a) approv	∕ed b)∐ disapp	proved.	•				
12)☐ The oat	h or declaration is objected to by	he Examiner.			ę				
Priority under 35	USC 8119		*:						
	ledgment is made of a claim for fo	oreian prionty under 35	USC δ 119(a))-(d) or (f)					
)☐ Some * c)☐ None of:	neigh phonty under co		/ (- / • (() / () / ()					
	ertified copies of the priority docu	ments have been rece	ived						
_				on No.					
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCF Rule 17.2(a)).									
	attached detailed Office action for		-	•					
14) Acknow	ledgement is made of a claim for	domesuc phonty unde	1 33 0.3.6. 8 11	ਰ(ੳ).					
Attachment(s)									
16) 🔲 Notice of Draft	rences Cited (PTO-892) sperson's Patent Drawing Review (PTO-9 sclosure Statement(s) (PTO-1449) Paper	• • • • • •	Notice of Informal	ry (PTO-413) Paper Patent Application (
U.S. Patent and Trademark Offic PTO-326 (Rev. 01-01)		ice Action Summary		Pari	of Paper No. 4				

Art Unit: 2155

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

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).

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

Application/Control Numb 39/608,872

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Page 2

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).
- 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

Application/Control Numb 39/608,872

Page 3

Art Unit: 2155

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)

- 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).

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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).

- As per claim 65, Levin et al teach a computer system for speech-based navigation 11. (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).

Petitioner Microsoft Corporation - Ex. 1008, p. 185

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Application/Control Numb 39/608,872

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- 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

Page 6

Art Unit: 2155

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).

Art Unit: 2155

Response to Arguments

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

Art Unit: 2155

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 STAT DEPARTMENT OF COMMERCE
Patent and Tracemark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

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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 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 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 SRI 1P037B DOCKET NO .: _ APPLICANT: HALVERSON, et al The following has been received in the U.S. Patent and Trademark Office on the date of this facsimile: X Transmittal Letter Petition Disclosure Statement & PTO-1449 Fee Transmittal (2 copies) X Deposit Account Transaction Priority Document sheets) informal Facsimile Transmission Certificate Drawings (X Petition for Extension of Time (2 copies) dated July 17, 2002 Amendment and Response 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 De Nardi Name of person signing this certificate

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FORM		First Named Inventor	HALVERSON	
(to be used for all co	mespondence after in	itial filing)	Group Art Unit	2155
			Examiner Name	F. BACKER
Total Number of Pages	s in This Submission	13	Attorney Docket Number	SRI 1 P 037B
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S. Castor

09/608,872

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: 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

SIR:

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.

(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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1)

- (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.
- (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;
 - (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.
- (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

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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

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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

- (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 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.

MOSER PATTERSON SHERIDAN

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09/608,872

Respectfully submitted,

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

Kin-Wah Tong, Attorney Reg. No. 39,400

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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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	in 37 CFR §1.56(c) m	n a counterpart application an ore than thirty days prior to the	d this communication was not re e filing of the Information Disclos	eceived by any individual designated sure Statement.
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Ł.	Wah Tong, Attorney			Mailing by First Class Mail
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I .	ser, Patterson & Sh	eridan, LLP		ssistant Commissioner for Patents,
1	orneys at Law Shrewsbury Avenue	e. Suite 100	VVasilington, U.C. 20231	14.1
l	ewsbury, New Jerse		Signature of Fe	rsof Mailing Correspondence
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U.S. Department of Commerce, Patent and Trademark Office (PTO Form 1449 modified)							. .		
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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.





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

			<i>"</i>	
APPLICATION NO.	FILING DATE ·	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/608,872	06/30/2000	Christine Halversen	SRIIp037B	2382
7	590 10/04/2002	•		
	I, MOSER & PATTER	SON, LLP	EXAM	INER
SUITE 100	BURY AVENUE	•	JEAN, FR	ANTZ B
SHREWSBUR	Y, NJ 07702		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)

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	Application No.		Applicant(s)	
	09/608,872	, ,	HALVERSEN ET	AL.
Office Action Summary	Examiner		Art Unit	
	Frantz B. Jean	حشير	2155	
The MAILING DATE of this communication ap Period for Reply	pears on the cover sh	eet with the	correspondence ad	dress
A SHORTENED STATUTORY PERIOD FOR REPUTHE MAILING DATE OF THIS COMMUNICATION. - Extensions of time may be available under the provisions of 37 CFR 1. 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 report of NO period for reply is specified above, the maximum statutory period Failure to reply within the set or extended period for reply will, by statustic Any reply received by the Office later than three months after the mailing earned patent term adjustment. See 37 CFR 1.704(b). Status	136(a). In no event, however, oly within the statutory minimur will apply and will expire SIX (e, cause the application to bec	may a reply be ti n of thirty (30) da 6) MONTHS fron ome ABANDON(mely filed ys will be considered timel n the mailing date of this ci ED (35 U.S.C. § 133).	y. ommunication.
1) Responsive to communication(s) filed on 7/2	<u> 29/2002</u> .			•
2a) This action is FINAL. 2b) ⊠ T	his action is non-final.			
3) Since this application is in condition for allow closed in accordance with the practice unde	vance except for form	al matters, p 35 C.D. 11,	rosecution as to th 453 O.G. 213.	e ments is
Disposition of Claims		•		
4) \boxtimes Claim(s) <u>56-82</u> is/are pending in the application	on.			
4a) Of the above claim(s)is/are withdra	awn from consideratio	n.		
5) Claim(s)is/are allowed.		-		•
6)⊠ Claim(s) <u>56-82</u> is/are rejected.	•			
7) Claim(s) is/are objected to.		es. Ar		
8) Claim(s) are subject to restriction and/ Application Papers	or election requiremen	nt.		
9) The specification is objected to by the Examin	er.	,		
10) The drawing(s) filed on is/are: a) acce	epted or b)⊡ objected t	o by the Exa	aminer.	
Applicant may not request that any objection to the	* '		• •	
11) The proposed drawing correction filed on	_ is: a)□ approved b) disappr	oved by the Examin	er. ,
If approved, corrected drawings are required in re	eply to this Office action.			
12)☐ The oath or declaration is objected to by the E	xaminer.			
Priority under 35 U.S.C. §§ 119 and 120	A training	•		
13) Acknowledgment is made of a claim for foreig	n priority under 35 U.	S.C. § 119(a)-(d) or (f).	
a) ☐ All b) ☐ Some * c) ☐ None of:				
 Certified copies of the priority documer 	its have been receive	d.		
2. Certified copies of the priority documer	its have been receive	d in Applicat	tion No	
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14) Acknowledgment is made of a claim for domes				Lannlication\
a) The translation of the foreign language pr				. application).
15) Acknowledgment is made of a claim for domes				
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)	5) 🗌 No	tice of Informal	ry (PTO-413) Paper No Patent Application (PT	
J.S. Patent and Trademark Office PTO-326 (Rev. 04-01) Office A	Action Summary		Part of	Paper No. 24

Page 2

Art Unit: 2155

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.
- 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

Page 3

Application/Control Number: 09/608,872:

Art Unit: 2155

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).

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- 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

Page 5

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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

Page 6

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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

Page 7

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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).
- 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).

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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

Applicant's arguments filed on 1/18/12 have been fully considered but they are 20. 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

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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

Page 10

Art Unit: 2155

(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/

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				Frantz B.	Jean	2155	Page 1 of 1	
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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	}	Name		Classification	
*	А	US-6,317,684 B1	11-2001	Roeseler et al.			340/990	
*	В	US-6,349,257 B1	02-2002	Liu et al.			340/5.6	
*	С	US-6,314,365 B1	11-2001	Smith, Nicholas E.			340/988	
	D	US-6,353,661 B1	03-2002	Bailey, III, John Ed	lson ·		379/88.17	
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U.S. Patent and Trademark Office PTO-892 (Rev. 01-2001)

Notice of References Cited

Part of Paper:No. 24

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



IF IT WAS SENT RECIPIENT, PLEASE CONFIDENTIAL NECESSARY. YOU	OR RECEIVED INCORRI TAKE NOTICE THAT TH MATERIAL, AND YOUR MAY ARRANGE TO RET LISTED ABOVE	ECTLY, OR YOU ARE NOT THE INTENDED IIS MESSAGE MAY CONTAIN PRIVILEGED OR DUE REGARD FOR THIS INFORMATION IS URN THIS MATERIAL BY CALLING THE FIRM AT (732) 530-9404 **********************************
TO:	·	ents
FAX NO.:	703-746-7239	,
FROM:	Kin-Wah Tong	
DATE:	January 6, 2003	
MATTER:	Serial No. 09/608,87	72 Filed: June 30, 2000
DOCKET NO.:	SRI 1P037B	
APPLICANT:The following has been in	HALVERSON, et al eceived in the U.S. Patent a	nd Trademark Office on the date of this facsimile:
Petition Disclosure Statement Priority Document Drawings (she Petition for Extension X Response	ets) informal n of Time (2 copies)	X Transmittal Letter (2 copies) Fee Transmittal (2 copies) Deposit Account Transaction X Facsimile Transmission Certificate dated January 6, 2003
I hereby certify	that this correspondence is t	DESSION UNDER 37 C.F.R. §1.8 Desing transmitted by facsimile to the Commissioner for 20231 on January 6, 2003, Facsimile No.
Kin-Wah Tong Name of person signing		Signature and date January 6, 2003

Received from < 732 530 9808 > at 1/6/03 7:03:49 PM [Eastern Standard Time]

			Appli	cation Number	09/608,872
TRANSMITTAL		Filing	Date	June 30, 2000	
FO	RM		First	Named Inventor	HALVERSON
(to be used for all corres	pondence after ini	itial filing)	Group	Art Unit	2155
	٠,		Exam	iner Name	FRANTZ JEAN
otal Number of Pages in	This Submission	1	Attorn	ey Docket Number	SRI 1 P 037B
		ENCL	OSURES	(check all that apply)	
Fee Transmittal Form			ment Pa Application		After Allowance Communication to Group
Fee Attached		☐ Drawin	g(s)		Appeal Communication to Board of Appeals and Interferences
Amendment / Respor	ise	Licensi	ng-relaté	ed Papers	Appeal Communication to Group (Appeal Notice, Brief, Reply Brief)
After Final	.]	Petition	1		Proprietary Information
Affidavits/declara	tion(s)		onal App		Status Letter
Extension of Time Re	Extension of Time Request Power of Attorney, R		ey, Revocation espondence Address	Other Enclosure(s) (please identify below):	
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Date Ja	nuary 6, 2003		-	•	, i i
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Received from < 732 530 9808 > at 1/6/03 7:03:49 PM [Eastern Standard Time]

	_	Appli	cation Number	09/608,872
TRANSMITTAL		Filing	Date	June 30, 2000
FORM		First	Named Inventor	HALVERSON
(to be used for all correspondence afte	r initlal filing)	Group	Art Unit	2155
		Exam	ner Name	FRANTZ JEAN
otal Number of Pages in This Submiss	ion	Attorn	ey Docket Number	SRI 1 P 037B
	ENCL	OSURES	(check all that apply) .	
Fee Transmittal Form	Assign	ment Pa Application		After Allowance Communication to Group
Fee Attached	☐ Drawin	g(s)		Appeal Communication to Board of Appeals and Interferences
Amendment / Response	Licens	ing-relate	ed Papers	Appeal Communication to Group (Appeal Notice, Brief, Reply Brief)
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Affidavits/declaration(s)	Petition Provisi	n to Conv Ionai App		Status Letter
Extension of Time Request		Power of Attorney, Revocation Change of Correspondence Address		Other Enclosure(s) (please identify below):
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Response to Missing Parts/ Incomplete Application				
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Received from < 732 530 9808 > at 1/6/03 7:03:49 PM [Eastern Standard Time]

MOSER PATTERSON SHERIDAN

09/608,872

#15

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

SIR:

24).

RESPONSE UNDER 37 C.F.R. § 1.111

This response addresses the Office Action dated October 4, 2002 (Paper No.

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.

09/608.872

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:

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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, 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

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interpretation of the spoken request;

- 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 guery, 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 settop 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

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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 <u>a portable</u> 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

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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,

Kin-Wah Tong, Attorney

Reg. No. 39,400 (732) 530-9404

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

1/6/03



United States Patent and Trademark Office

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

'APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/608,872	06/30/2000	· Christine Halversen	SRIIp037B	2382
75	590 01/09/2003			
	, MOSER & PATTE	RSON, LLP	EXAM	INER
595 SHREWSE SUITE 100	BURY AVENUE		JEAN, FR	ANTZ B
SHREWSBUR	Y, NJ 07702		ART UNIT	PAPER NUMBER 26
			2155	
			DATE MAIL ED. 01/00/0003	•

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

PTO-90C (Rev. 07-01)

<u> </u>	Application No.	Applicant(s)
And an above Occasions and	09/608,872	HALVERSEN ET AL.
Interview Summary	Examiner	Art Unit
	Frantz B. Jean	2155
All participants (applicant, applicant's representative, PT	O personnel):	
(1) Frantz B. Jean.	(3)	•
(2) <u>Kin-Wah Tong</u> .	(4)	
Date of Interview: 23 December 2002.		
Type: a)☐ Telephonic b)☐ Video Conference c)☒ Personal [copy given to: 1)☐ applicant	2)⊠ applicant's representat	ive]
Exhibit shown or demonstration conducted: d)☐ Yes If Yes, brief description:	e)⊠ No.	
Claim(s) discussed: Indefendent Claims	•	
Claim(s) discussed: Independent Claims Identification of prior art discussed: Leveni & B	ailey.	
Agreement with respect to the claims f)☐ was reached)□ _. N/A.
Substance of Interview including description of the gener reached, or any other comments:	al nature of what was agreed	to if an agreement was
(A fuller description, if necessary, and a copy of the ame allowable, if available, must be attached. Also, where no allowable is available, a summary thereof must be attach	copy of the amendments that	
i) It is not necessary for applicant to provide a checked).	separate record of the substar	nce of the interview(if box is
Unless the paragraph above has been checked, THE FOMUST INCLUDE THE SUBSTANCE OF THE INTERVIENCE ACTION has already been filed, APPLICANT IS GIVEN ON STATEMENT OF THE SUBSTANCE OF THE INTERVIENCE OF THE	W. (See MPEP Section 713.0 NE MONTH FROM THIS INTE EW. See Summary of Record	04). If a reply to the last Office RVIEW DATE TO FILE A of Interview requirements on
Applicants' representative	_ believer than	+ Remillentin
as claimed doks de fine Levini & Sailey . "Xa	over Repri	ir act of second
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Examiner Note: You must sign this form unless it is an Attachment to a signed Office action.	Examiner's si	gnature, if required
J.S. Palent and Trademark Office PTO-413 (Rev. 03- 98) Inte	rview Summary	Paper No.

mmary 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

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,
- an identification of the claims discussed,
 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

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	Application No.	Applicant(s)	
	09/608,872	HALVERSEN E	
Notice of Allowability	Examiner	Art Unit	T :
	Frantz B. Jean	2155	
The MAILING DATE of this communication claims being allowable, PROSECUTION ON THE MERITE ewith (or previously mailed), a Notice of Allowance (PTO TICE OF ALLOWABILITY IS NOT A GRANT OF PATE the Office or upon petition by the applicant. See 37 CFR	FS IS (OR REMAINS) CLOSE L-85) or other appropriate co NT RIGHTS. This application	ED in this application. If not incommunication will be mailed in a	luded lue course. THIS
This communication is responsive to the response fill	ed on 1/06/2003.		
The allowed claim(s) is/are <u>56-82</u> .			•
The drawings filed on are accepted by the Ex			
Acknowledgment is made of a claim for foreign prioria) ☐ All b) ☐ Some* c) ☐ None of the:	ty under 35 Ü.S.C. § 119(a)-(d) or (f).	
 Certified copies of the priority documents 	s have been received.		
2. Certified copies of the priority documents	s have been received in Appli	cation No	
3. Copies of the certified copies of the prior	ity documents have been rec	eived in this national stage app	lication from the
International Bureau (PCT Rule 17.2(a)).	- ''	
* Certified copies not received:	M		•
Acknowledgment is made of a claim for domestic price	oritv under 35 U.S.C. § 119(e)	(to a provisional application).	
(a) The translation of the foreign language provision			
Acknowledgment is made of a claim for domestic price	3.75.87		
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plicant has THREE MONTHS FROM THE "MAILING DA' low. Failure to timely comply will result in ABANDONME	TE" of this communication to NT of this application. THIS	file a reply complying with the in THREE-MONTH PERIOD IS N	requirements noted
A SUBSTITUTE OATH OR DECLARATION must be FORMAL PATENT APPLICATION (PTO-152) which give			or NOTICE OF
☐ CORRECTED DRAWINGS must be submitted.		•	•
(a) including changes required by the Notice of Dra	ftsperson's Patent Drawing R	eview (PTO-948) attached	
1) ⊠ hereto or 2) ☐ to Paper No			
(b) including changes required by the proposed dra	wing correction filed	which has been approved by t	he Examiner.
(c) ☐. including changes required by the attached Exa	•	• • • • • • • • • • • • • • • • • • • •	
Identifying indicia such as the application number (see 37 of each sheet. The drawings should be filed as a separate	CFR 1.84(c)) should be written	on the drawings in the top marg	in (not the back)
☐ DEPOSIT OF and/or INFORMATION about the tached Examiner's comment regarding REQUIREMENT F			ed. Note the
tachment(s)			
 Notice of References Cited (PTO-892) Notice of Draftperson's Patent Drawing Review (PTO-9) Information Disclosure Statements (PTO-1449), Paper Examiner's Comment Regarding Requirement for Depotential 	148) 4□ Inte No 6□ Exa	ice of Informal Patent Applicati rview Summary (PTO-413), Pa miner's Amendment/Commen miner's Statement of Reasons er	aper No
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S. Patent and Trademark Office	1 .		

Application/Control Number: 09/608,872:

Page 2

Art Unit: 2155

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.

Petitioner Microsoft Corporation - Ex. 1008, p. 231

Application/Control Number: 09/608,872:

Page 3

Art Unit: 2155

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)

ATTACHMENT TO PAPER NO. 27

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

Application No. 9/608872

NOTICE OF DRAFTSPERSON'S PATENT DRAWING REVIEW

The drawing(s) filed (insert date) 30-Ware:	
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 submission of new, corrected drawings when necessary. Corrected drawing	reasons indicated below. The Examiner will require must be sumitted according to the instructions on the back of this notice.
DRAWINGS. 37 CFR 1.84(a): Acceptable categories of drawings: Black ink. Color.	ARRANGEMENT OF VIEWS. 37 CFR 1.84(i) Words do not appear on a horizontal, left-to-right fashion
Color drawings are not acceptable until petiton is granted.	when page is either upright or turned so that the top becomes the right side, except for graphs. Fig(s)
Pencil and non black ink not permitted. Fig(s) PHOTOGRAPHS. 37 CFR 1.84(b) 1 full-tone set is required. Fig(s)	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
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)	reproduction. Fig(s) 10. CHARACTER OF LINES, NUMBERS, & LETTERS.
Paper not flexible, strong, white, and durable. Fig(s)	37 CFR 1.84(i) Lines, numbers & letters not uniformly thick and well
Erasures, alterations, overwritings, interlineations, folds, copy machine marks not accepted. Fig(s) Mylar, velum paper is not acceptable (too thin).	defined, clean, durable, and black (poor line quality). Fig(s) 11. SHADING. 37 CFR 1.84(m)
Fig(s) 4. SIZE OF PAPER. 37 CFR 1.84(1): Acceptable sizes: 21.0 cm by 29.7 cm (DIN size A4)	Solid black areas pale. Fig(s) Solid black shading not permitted. Fig(s) Shade lines, pale, rough and blurred. Fig(s)
21.6 cm by 27.9 cm (8 1/2 x 11 inches) All drawing sheets not the same size.	12. NUMBERS, LETTERS, & REFERENCE CHARACTERS 37 CFR 1.84(p)
Sheet(s) Drawings sheets not an acceptable size. Fig(s) MARGINS. 37 CFR 1.84(g): Acceptable margins:	Numbers and reference characters not plain and legible. Fig(s) Figure legends are poor. Fig(s)
Top 2.5 cm Left 2.5cm Right 1.5 cm Bottom 1.0 cm SIZE: A4 Size	Numbers and reference characters not oriented in the same direction as the view. 37 CFR 1.84(p)(1)
Top 2.5 cm Left 2.5 cm Right 1.5 cm Bottom 1:0 cm SIZE: 8 1/2 x 11	Fig(s) English alphabet not used. 37 CFR 1.84(p)(2) Figs
Margins not acceptable. Fig(s)	Numbers, letters and reference characters must be at least 32 cm (1/8 inch) in height. 37 CFR 1.84(p)(3) Fig(s)
6. VIEWS. 37 CFR 1.84(h) REMINDER: Specification may require revision to correspond to drawing changes.	13. LEAD LINES. 37 CFR 1.84(q) Lead lines cross each other. Fig(s) Lead lines missing. Fig(s)
Partial views. 37 CFR 1.84(h)(2) Brackets needed to show figure as one entity.	14. NUMBERING OF SHEETS OF DRAWINGS. 37 CFR 1.84(t) Sheets not numbered consecutively, and in Arabic numerals
Fig(s)Views not labeled separately or properly. Fig(s)	beginning with number 1. Sheet(s) 15. NUMBERING OF VIEWS. 37 CFR 1.84(u) Views not numbered consecutively, and in Arabic numerals.
Enlarged view not labeled separetely or properly. Fig(s)	beginning with number 1. Fig(s) 16. CORRECTIONS. 37 CFR 1.84(w) Corrections not made from prior PTO-948
7. SECTIONAL VIEWS: 37 CFR 1.84 (h)(3) Hatching not indicated for sectional portions of an object.	dated
Fig(s) Sectional designation should be noted with Arabic or Roman numbers. Fig(s)	Surface shading shown not appropriate. Fig(s) Solid black shading not used for color contrast. Fig(s)
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COMMENTS	798
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	.
REVIEWER DATES //	9-03 TELEPHONE NO
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Attachment for PTO-948 (Rev. 03/01, or earlier)

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 notice 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 within the time period set in the attached Office communication. 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

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

#27

NOTICE OF ALLOWANCE AND FEE(S) DUE

7590

03/11/2003

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

EXA	MINER
JEAN, F	RANTZ B
ART UNIT	CLASS-SUBCLASS
2155	709-218000

DATE MAILED: 03/11/2003

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I	APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
ľ	· 09/608 872	06/30/2000	Christine Halversen	SRILP037B	2382

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

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APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAĻ 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.

Page 1 of 4

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 (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.

CORRESPONDENCE ADDRESS (Noie: Legibly mark-up with any corrections or use Block 1)

Note: A certificate of mailing can only be used for domestic mailings of the

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	SRIL PO37B	2382

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

APPLN. ITPE	SMALL ENTITY	1220F LEE	PUBLICATION FEE	I TOTAL FEE(S) DUE	DATE DUE	
nonprovisional	YES	\$650	\$0	\$650	06/11/2003	
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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 from the names of up to 3 registered or agents OR, alternatively, (2) single firm (having as a memilattorney or agent) and the nar registered patent attorneys or agis listed, no name will be printed.	patent attorneys the name of a ber a registered nes of up to 2 ents. If no name		
3. ASSIGNEE NAME AND PLEASE NOTE: Unless: been previously submitted (A) NAME OF ASSIGNEE	an assignee is identified bel I to the USPTO or is being s	ow, no assignee data w ubmitted under separate	PATENT (print or type) ill appear on the patent. Inclusion of cover. Completion of this form is	NOT a substitute for filing an assi	te when an assignment has gnment.	

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Please check the appropriate assignee cate	egory or categories (will not	be printed on the patent)	individual oc	orporation or other private group entit	ty 🖸 government
4a. The following fee(s) are enclosed:		4b. Payment of Fee(s):			
☐ Issue Fee		A check in the amount	t of the fee(s) is enclose	d.	
☐ Publication Fee		Payment by credit care	d. Form PTO-2038 is at	tached.	
Advance Order - # of Copies		☐ The Commissioner is Deposit Account Number	hereby authorized by ch	arge the required fee(s), or credit any nclose an extra copy of this form).	overpayment, to
Commissioner for Patents is requested to	apply the Issue Fee and Pub	lication Fee (if any) or to re	-apply any previously p	oaid issue fee to the application identi	ified above.
(Authorized Signature)	(Date)	1.3			
NOTE; The Issue Fee and Publication other than the applicant; a registered interest as shown by the records of the U	attorney or agent; or the a	ssignee or other party in			

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, D.C. 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 Potent and Tradomark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARK
Washington, D.C. 20231

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API	LICATION NO.	FILING DATE		FIRST NAMED INVENTOR	·	ATTORNEY DOCKET NO.	CONFIRMATION NO.	_
	09/608,872	06/30/2000		Christine Halversen	<u> </u>	SRILP037B	2382	
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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.

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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 TRADEMARK Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/608,872	06/30/2000	Christine Halversen	SRILP037B	2382
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THOMASON, M	OSER & PATTERS	ON, LLP	JEAN, FRA	NTZ B
595 SHREWSBUR SUITE 100	YAVENUE		ART UNIT	PAPER NUMBER
SHREWSBURY, N			2155	
UNITED STATES			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.

Page 4 of 4

PTOL-85 (REV. 04-02) Approved for use through 01/31/2004.

Transaction History Date 903-05-6

Date information retrieved from USPTO Patent
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system records at www.uspto.gov

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HOMASON, MOS	SER & PATTERS	SON, LLP		formal drawing,	must have its own certificate of	mailing or transmission.
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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 <u>7</u> 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/

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 <u>April 30 Aor 3</u>, 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

Date of signature

Petitioner Microsoft Corporation - Ex. 1008, p. 240

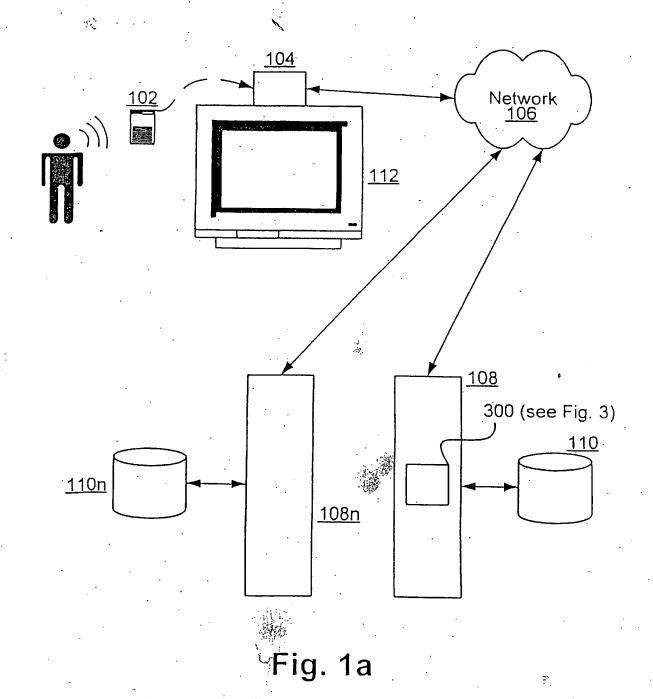
"MOBILE NAVIGATION OF .

Halverson, et al. WORK-BASED ELECTRONIC INFORMATION Serial No. 09/608,872 SRI/4116-6

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Halverson, et al.

"MOBILE NAVIGATION OF . WORK-BASED ELECTRONIC INFORMATISerial No. 09/608,872 SRI/4116-6

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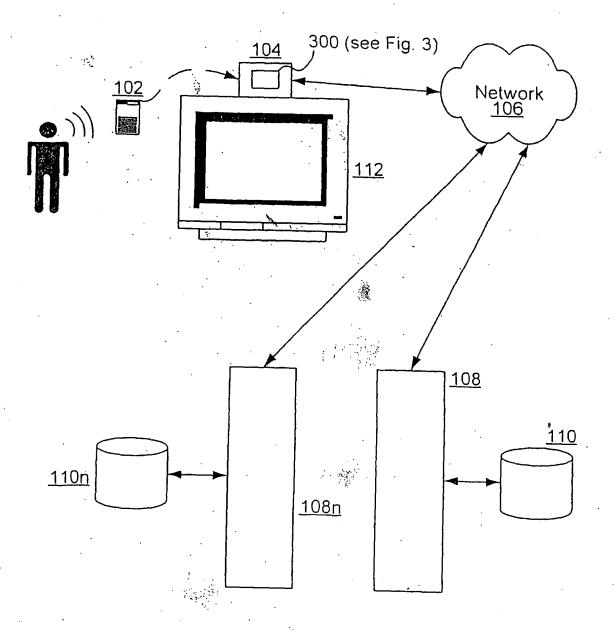


Fig. 1b

Halverson, et al.

"MOBILE NAVIGATION OF WORK-BASED ELECTRONIC INFORMATION OF Serial No. 09/608,872 SRI/4116-6



3/7

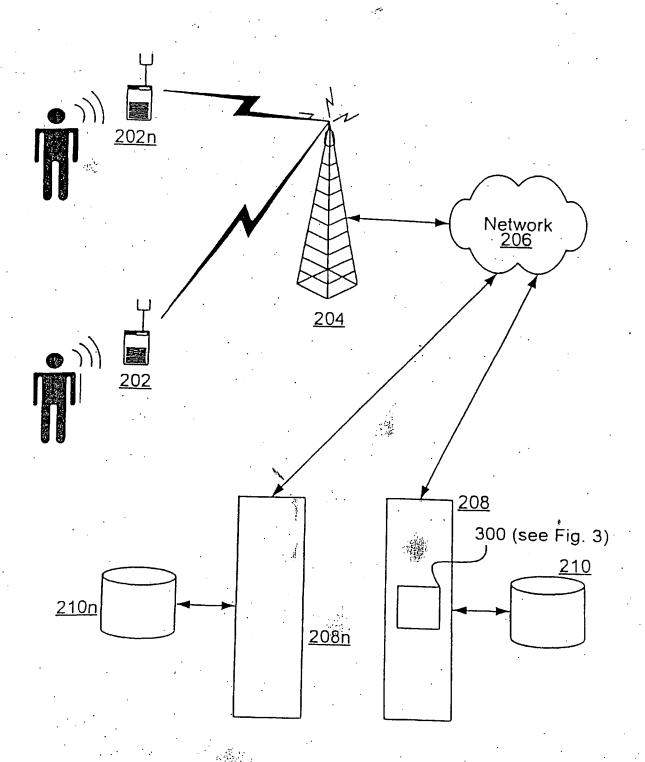


Fig. 2

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Halverson, et al.
WORK-BASED ELECTRONIC INFORMATION Serial No. 09/608,872 SRI/4116-6

ISING SPOKEN INPUT"

4/7

REQUEST PROCESSING LOGIC 300

SPEECH RECOGNITION ENGINE

NATURAL LANGUAGE PARSER

QUERY CONSTRUCTION LOGIC

QUERY REFINEMENT LOGIC

310

320

Fig. 3

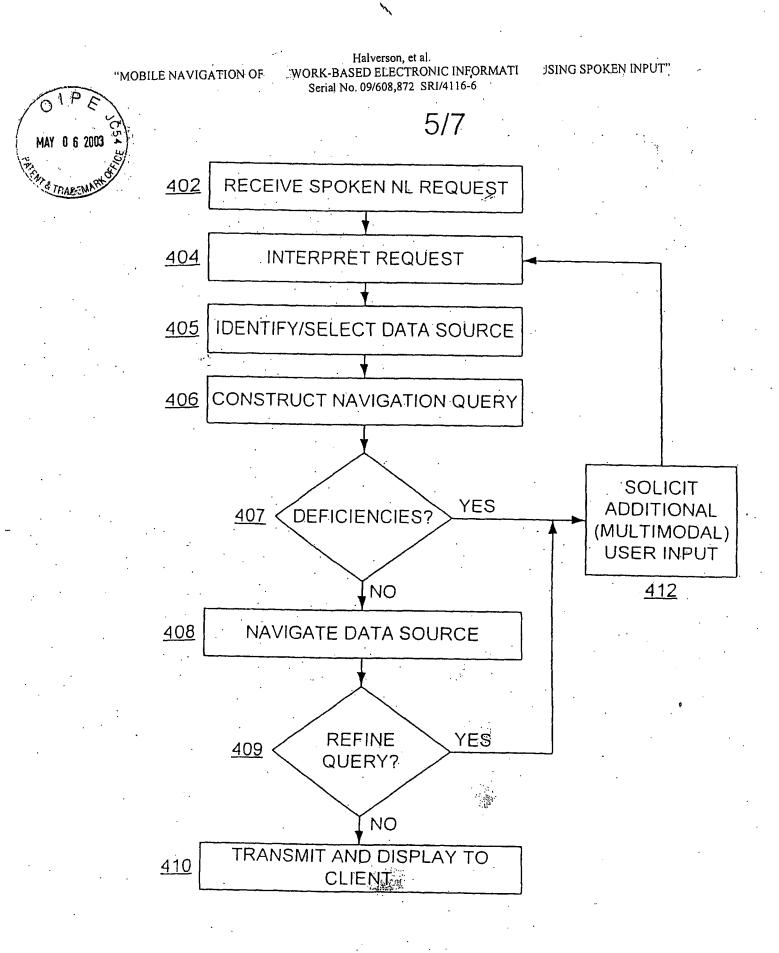


Fig. 4

"MOBILE NAVIGATION OF

Halverson, et al.

FWORK-BASED ELECTRONIC INFORMATI

Serial No. 09/608,872 SRI/4116-6

JSING SPOKEŅ INPUT"

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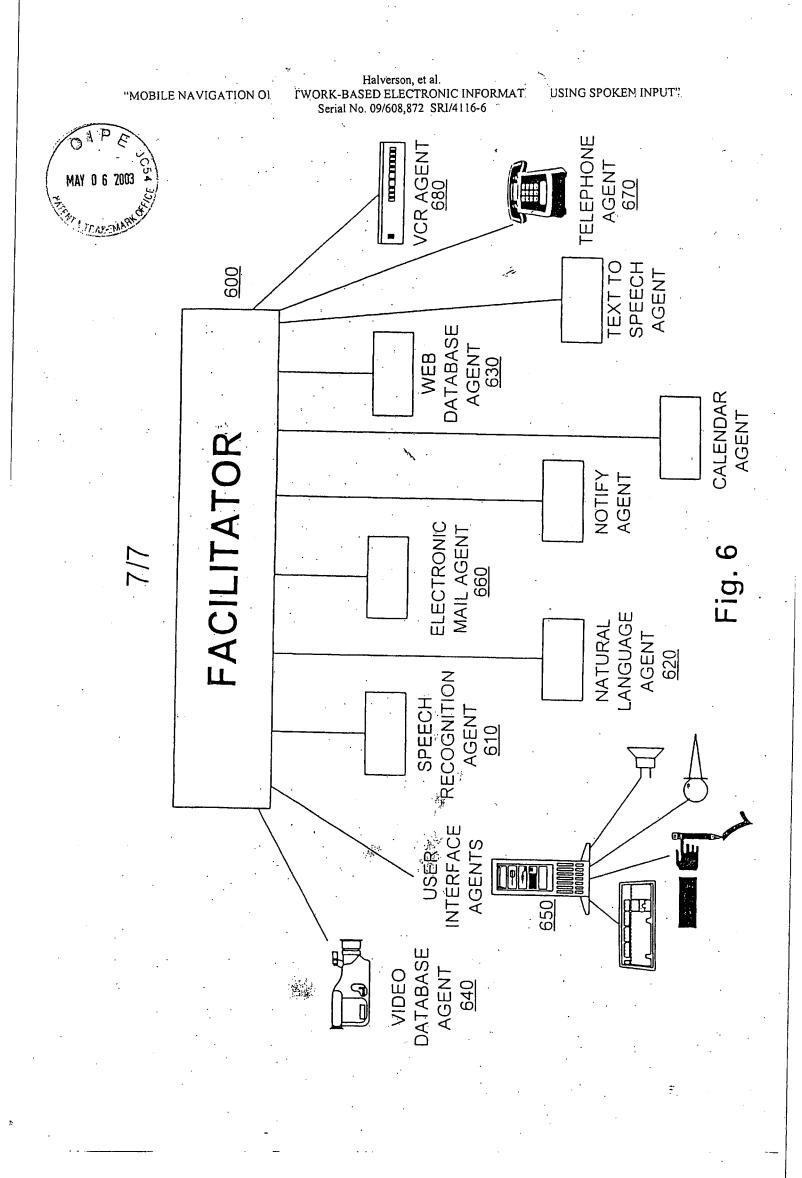
(from step 406, Fig. 4)

SCRAPE THE ONLINE SCRIPTED FORM TO EXTRACT AN INPUT TEMPLATE

INSTANTIATE THE INPUT TEMPLATE USING INTERPRETATION OF STEP 404

(to step 407, Fig. 4)

Fig. 5



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)

Case 1:17-cv-00055-UNA Document 3 Filed 01/19/17 Page 1 of 1 PageID #: 85

AO 120 (Rev. 08/10)								
,	Mail Stop 8 .S. Patent and Trademai P.O. Box 1450 ndria, VA 22313-1450	rk Office	REPORT ON T FILING OR DETERMINA ACTION REGARDING A TRADEMAR	ATION OF AN A PATENT OR				
filed in the U.S. Dist		for the	1116 you are hereby advised that a court act. District of Delaware	ion has been on the following				
DOCKET NO.	DATE FILED		STRICT COURT					
	1/19/2017		for the District of Delaw	are				
PLAINTIFF IPA TECHNOLOGIES II	NC.	,	DEFENDANT SONY CORPORATION, ET AL.	,				
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK		HOLDER OF PATENT OR TRA	DEMARK				
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	1			-				
	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 TRA	DEMARK				
1								
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In the abov	ve—entitled case, the follow	ing decision h	as been rendered or judgement issued:					
DECISION/JUDGEMENT								
2								
CLERK		(BY) DEPUTY	CLERK	DATE				
			4					

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

Case 1:17-cv-00287-UNA Document 3 Filed 03/20/17 Page 1 of 1 PageID #: 83

AO 120 (Rev. 08/10) REPORT ON THE Mail Stop 8 TO: Director of the U.S. Patent and Trademark Office FILING OR DETERMINATION OF AN P.O. Box 1450 ACTION REGARDING A PATENT OR Alexandria, VA 22313-1450 **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 for the District of Delaware filed in the U.S. District Court on the following $\ensuremath{\square}$ Patents. ($\ensuremath{\square}$ the patent action involves 35 U.S.C. § 292.): ☐ Trademarks or DOCKET NO. DATE FILED U.S. DISTRICT COURT 3/17/2017 for the District of Delaware PLAINTIFF IPA TECHNOLOGIES INC. **NVIDIA CORPORATION** PATENT OR DATE OF PATENT HOLDER OF PATENT OR TRADEMARK TRADEMARK NO. OR TRADEMARK 1 6,742,021 5/25/2004 IPA TECHNOLOGIES INC. IPA TECHNOLOGIES INC. 2 6,523,061 2/18/2003 3 6,757,718 6/29/2004 IPA TECHNOLOGIES INC. 4 In the above—entitled case, the following patent(s)/ trademark(s) have been included: DATE INCLUDED INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading DATE OF PATENT PATENT OR HOLDER OF PATENT OR TRADEMARK TRADEMARK NO. OR TRADEMARK 2 In the above—entitled case, the following decision has been rendered or judgement issued: DECISION/JUDGEMENT (BY) DEPUTY CLERK DATE CLERK

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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:

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The individual signing below has the authority to execute this document on behalf of DISH.

rentioners DIS	A Network Corporation and DISH	Network	.L.C.
Signature:	James E Hatt	Date:	12/19/2017
Name:	JAMES HANFT	_	
Title:	Omecton & Sacreporte Course	LIP	

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*.

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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 <i>et al.</i> , entitled "Document Stream Operating System" (" <i>Freeman</i> ")

1015	U.S. Patent No. 5,247,580 by Toshiyuki Kimura et al., entitled "Voice-operated remote control system" ("Kimura")
1016	Complaint, <i>IPA Technologies Inc. v. DISH Network Corp. et al.</i> , 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, 22 nd -24 th April 1996" Reference.
1032	Redline Comparison between article text of <i>Cheyer</i> 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 <i>Cheyer</i> 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-Petitioner 7699. electronic service by mail consents to at hop.guy@bakerbotts.com, eliot.williams@bakerbotts.com, and ali.dhanani@bakerbotts.com. A Power of Attorney is filed concurrently herewith under 37 C.F.R. § 42.10(b).

<u>Certification of Grounds</u>: 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.

<u>Fees</u>: 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

Petition for *Inter Partes* Review of U.S. Patent No. 6,757,718 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 Cooperative Multimodal on 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.

WorldCat

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.

Netherlands Royal Library

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*.

Institute for Perceptual Research

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 also publicly available the SRI website was on (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:

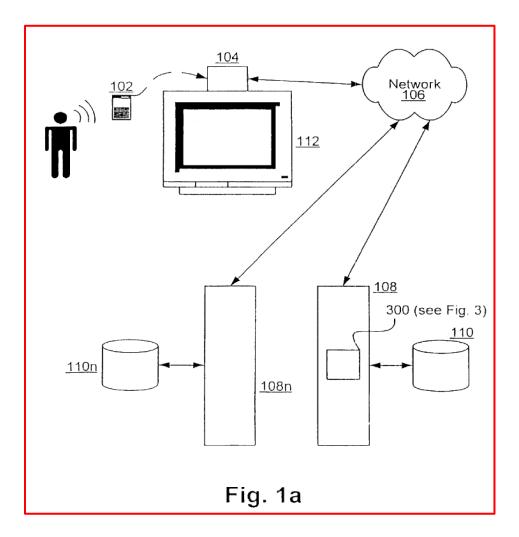
- 1. Claims 1-4, 6, 8-9, 10-13, 15, 17-18, 19-22, 24, and 26-27 are obvious over *Kupiec* with *Cheyer*.
- 2. Claims 1-4, 6, 8-9, 10-13, 15, 17-18, 19-22, 24, and 26-27 are obvious over *Kupiec* and *Cheyer* with *Kimura*.
- 3. Claims 6, 15, and 24 are obvious over *Kupiec* and *Cheyer* with *Freeman*.

III. OVERVIEW OF THE '718 PATENT

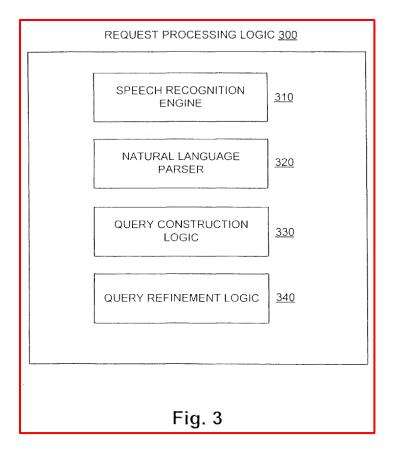
A. Summary of the Claimed Subject Matter

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.

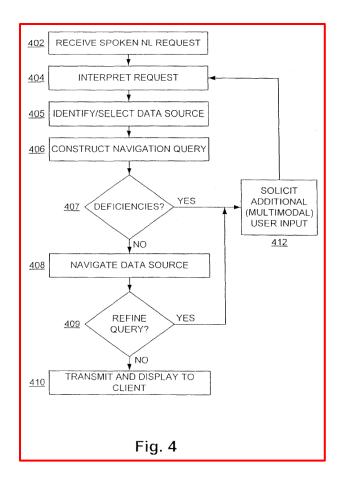


Id. at FIG. 1a. A "voice input device" receives voice input data. *Id.* at. 3:56-58. The voice input data is transmitted across a network to be interpreted by "request processing logic." *Id.* at. 4:11-15.



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.



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

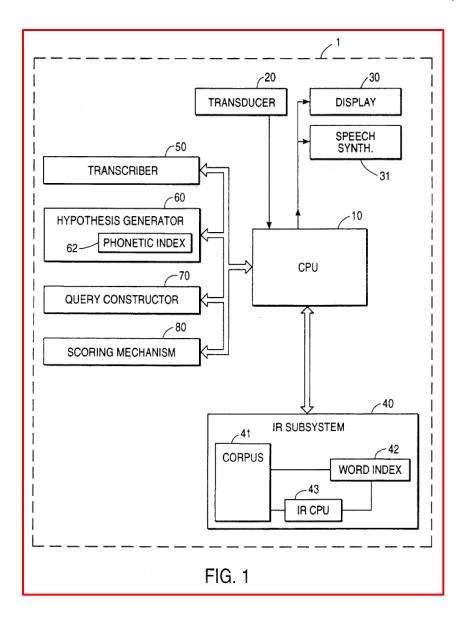
The '718 Patent claims what was well-known in the prior art. None of the prior art discussed below was considered by the Patent Office during prosecution of the '718 Patent.

A. Brief Summary of Kupiec (Ex. 1013)

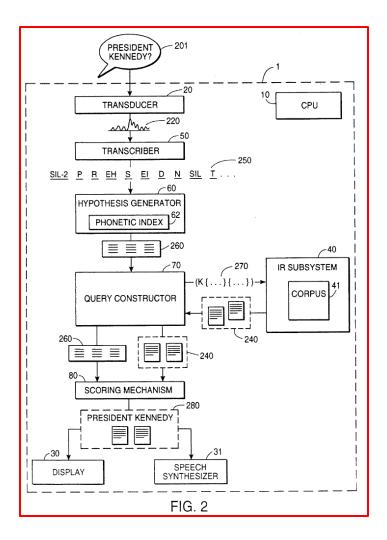
U.S. Patent No. 5,500,920 by Julian M. Kupiec entitled "Semantic co-occurrence filtering for speech recognition and signal transcription applications"

("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.



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.



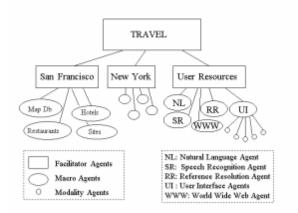
Kupiec's Fig. 2 shows a user "inputs a question 201 into system 1 by speaking ... where it is converted into a phonetic transcription 250." *Id.* at 9:18-23. Thereafter, the "phonetic transcription 250 is provided to hypothesis generator 60 where it is matched using phonetic index 62 to generate a set 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 "penequipped 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).

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.

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 penequipped 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	The method of claim 1, wherein the step of rendering the interpretation
& 3.	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	The method of claim 1, further comprising the steps of soliciting
4[a].	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 nonspoken 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 speechsynthesized 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

Petition for *Inter Partes* Review of U.S. Patent No. 6,757,718 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	refining the navigation query, based upon the additional input;
4[b].	

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 followup 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	and using the refined navigation query to select a portion of the
4[c].	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, Chever 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 Chever, "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 *Chever* 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 Chever.

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	The computer program of claim 10, further comprising a code segment
13[a]	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	a code segment that refines the navigation query, based upon the
13[b]	additional input;

See supra §VI.A.2, Element 4[b]. Ex. 1012, ¶714.

Claim	and a code segment that uses the refined navigation query to select a
13[c]	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	A system for speech-based navigation of an electronic data source
19[a]	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	(a) a mobile information appliance operable to receive a spoken request
19[b]	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	(b) spoker	n language	processing	logic,	operable	to	render	an
19[c]	interpretation	on of the spol	ken 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	(c) query construction logic, operable to construct a navigation query
19[d]	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	(d) navigation logic, operable to select a portion of the electronic data
19[e]	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	(e) electronic communications infrastructure for transmitting the
19[f]	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	The system of claim 19, further comprising user interaction logic
22[a]	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	and query refining logic operable to refine the navigation query based
22[b]	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	wherein the navigation logic users the refined navigation query to select
22[c]	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

Petition for *Inter Partes* Review of U.S. Patent No. 6,757,718 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.

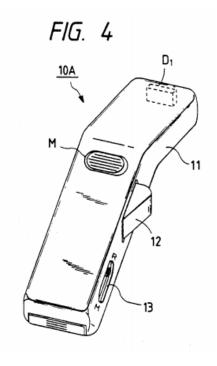
Kimura teaches that a handheld "voice-operated remote control system" can be used with a CPU and speech recognition to control AV devices such as

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:



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

Petition for *Inter Partes* Review of U.S. Patent No. 6,757,718

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

of recognizing the contents of a spoken request. Ex. 1012, ¶359.

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 Chever. To the extent that the combination of *Kupiec* and *Chever* 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 multiuser 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,

Thomason, Moser & Patterson, LLP 595 Shrewsbury Avenue Suite 100 Shrewsbury, NJ 07702

via FedEx overnight, to counsel for patent owner in the Lawsuit,

Marc A. Fenster Russ, August & Kabat 12424 Wilshire Boulevard, 12th Floor Los Angeles, CA 90025

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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).

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US006742021B1

(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

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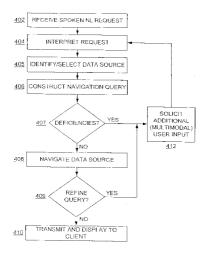
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(57) ABSTRACT

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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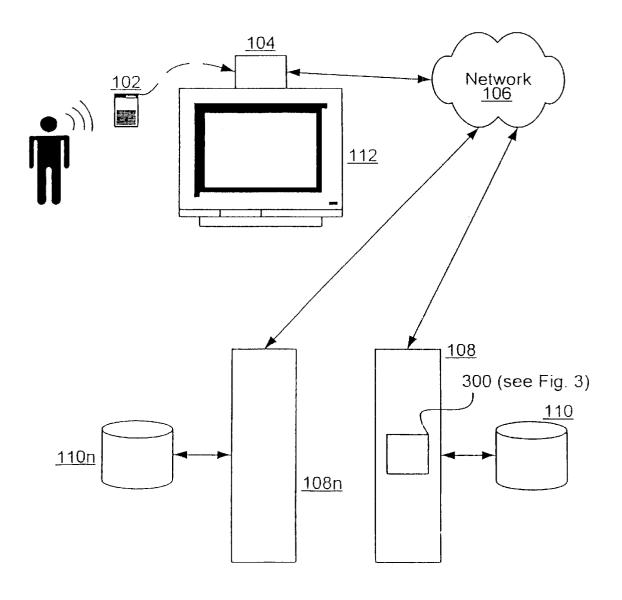


Fig. 1a

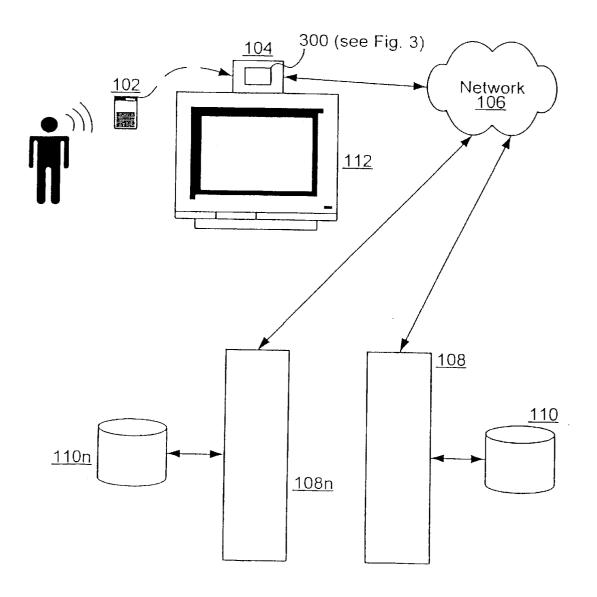


Fig. 1b

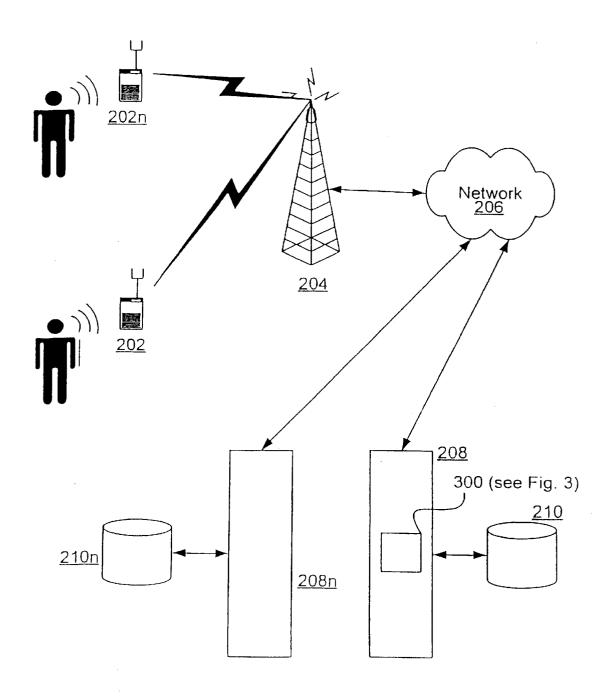


Fig. 2

REQUEST PROCESSING LOGIC 300

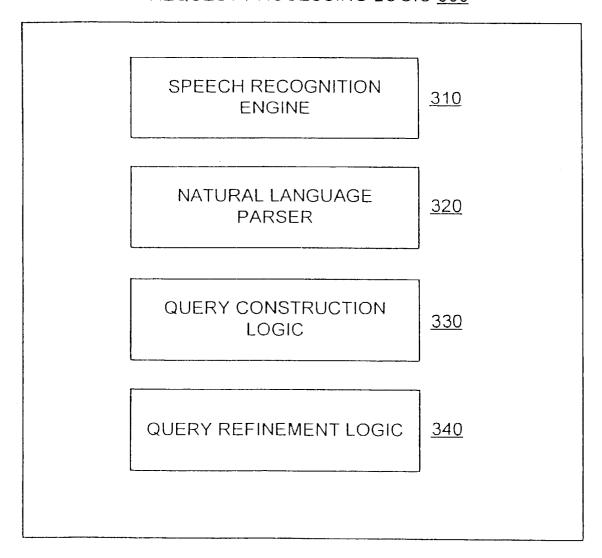


Fig. 3

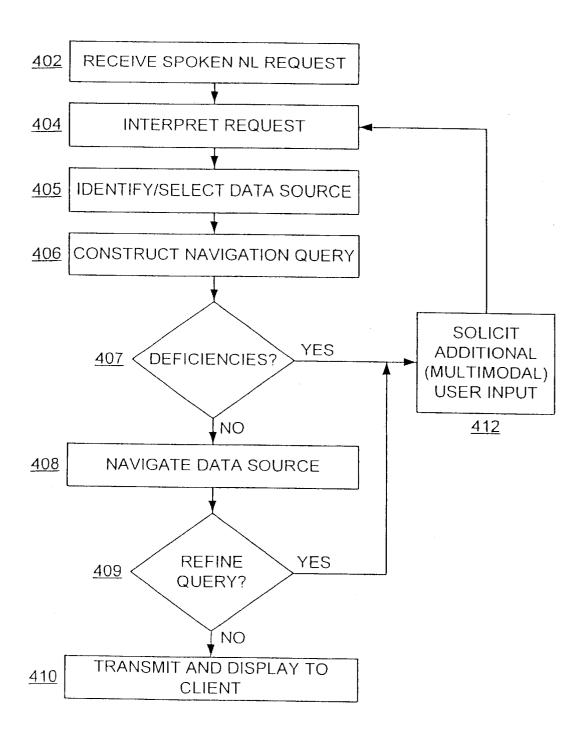


Fig. 4

May 25, 2004

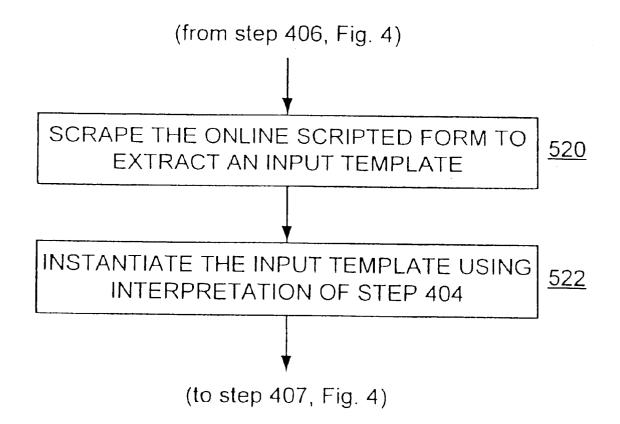
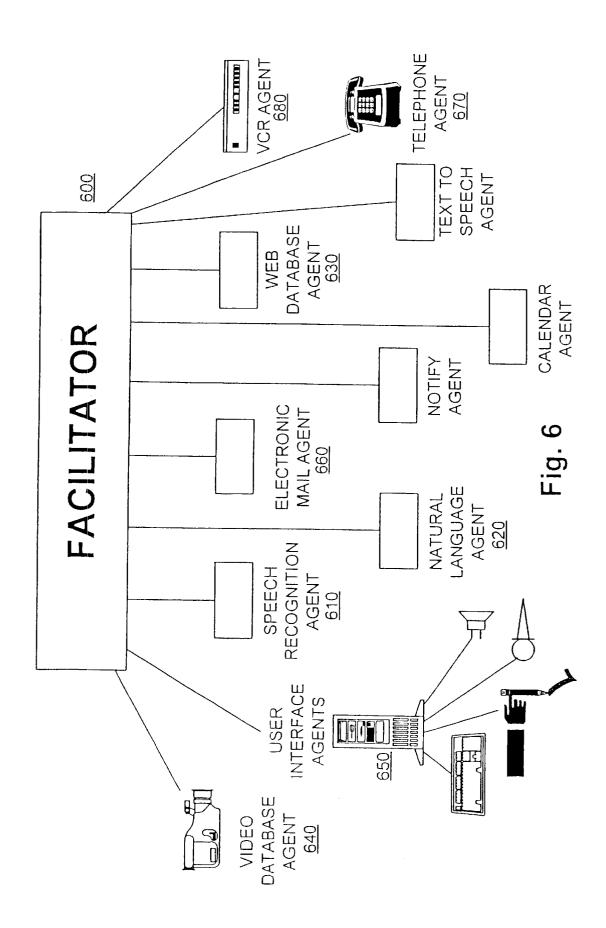


Fig. 5



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 10 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 15 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 20 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) 30 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 35 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 enterdatabase 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 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 50 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 55 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 underconstrained requests ("Show me the Clint Eastwood movie"). An approach is needed for handling and resolving such errors and ambiguities in a rapid, user-friendly, nonfrustrating 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-ata-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 tainment product in a context offering a dizzying range of 40 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 interpretanetworks for general information, multimedia content, or 45 tion 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. 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;
- FIG. 1b illustrates another system providing a spoken natural language interface for network-based information navigation, in accordance with an embodiment of the 20 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 30 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. 1a is an illustration of a data navigation system 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 heldnot 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 55 102 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 con-10 struction 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, 35 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 40 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 driven by spoken natural language input, in accordance with 45 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 considerdown to activate a listening mode, so that the system need 50 ation 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. 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 FIG. 1b, the voice data is transmitted from device 202 to 60 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 65 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

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 10 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 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 30 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 35 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 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 45 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 50 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 55 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. 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 65 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, contents are accessed and searched, for retrieval of the 15 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 decoding/formatting the desired electronic information that 40 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 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 clientside 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-ondemand 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 10 The Gemini parser is based on "unification grammar," 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 15 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 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 shrinkwrapped version available through popular consumer distribution channels. Basically, a speech recognition engine processes acoustic voice data and attempts to generate a text 30 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, 35 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 40 b. Constructing Navigation Queries 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 45 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 recogni- 50 tion 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 55 textual output of the speech recognition engine. In a preferred embodiment of the present invention, the naturallanguage 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 65 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. 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 naturallanguage processing system to re-score recognition hypothrecognition engine 310. A variety of commercial quality, 20 eses. 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/spnlint.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.

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 10 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 con- 15 structed 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 30 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 ated 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 40 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 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 55 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

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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, nonvoice 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 onemonth 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 user access to the data source is not supported, only medi- 35 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 weather information is available online through the medium 45 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 20 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" 25 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 30 "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 35 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 45 330 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 55 112 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 60 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 65 Unforgiven," having now been reminded of the title by the menu display.

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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 10 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.

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 received. 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

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 ArchitectureTM (OAA®) is a software 5 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 10 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 15 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 20 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 25 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 abovereferenced 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 55 uled time. 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 Battle-field 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", 65 Washington, DC, pp. 1–7, Association for Computational Linguistics

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"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 agentsin 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 35 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 40 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 embodi-45 ment 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 sched-

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, ¹⁵ 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 25 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 40 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 50 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 60 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

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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.

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- 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 5 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 inter-
- 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 15 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 com- 20 puting 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 25 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 30 scripted interface. include one or more required elements of the navigational query not determinable from the interpretation of the spoken
- 37. The system of claim 27, wherein the user interaction 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 50 navigational query not determinable from the interpretation 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 55 tered after a first navigation of the data source. 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, fiberoptic \}.
- 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 65 or more network servers located remotely from a user, comprising:

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- (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
- 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 logic solicits additional input in response to one or more 35 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 45 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 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 encoun-
 - 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
 - 60. The computer program of claim 59, wherein the act of selecting from the displayed option menu is performed by

- **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 ²⁰ 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 ³⁵ 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 40 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 50 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 65 to the data source, and using the input template to construct the navigation query.

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- **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, 5 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 ³⁵ 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 55 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 60 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 65 group: {coaxial cable, DSL, satellite, wireless/cellular, fiberoptic}.

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- 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 ren-40 dering 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 5 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 15 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 20 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

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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.
- 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 select-

ing 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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US Patent & Trademark Office

US 6,742,021 USPTO Transaction Information*

SEQ. ^δ	DATE	DESCRIPTION
JLQ.	DAIL	DESCRIPTION
1	28 Mar 2016	File Marked Found
		ENTITY STATUS SET TO UNDISCOUNTED (INITIAL DEFAULT SETTING OR
2	16 Aug 2006	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.

 $^{^{\}delta}$ Transaction Sequence Number (SEQ.) is unrelated to Paper Number in File Table of contents.



Page 1 of 2

US Patent & Trademark Office

US 6,742,021 USPTO Transaction Information*

SEQ. ^δ	DATE	DESCRIPTION
47	10 Apr 2002	Request for Extension of Time - Granted
48		Workflow - Request for RCE - Begin
49	10 Apr 2002 03 Apr 2002	Mail Advisory Action (PTOL - 303)
50		Advisory Action (PTOL-303)
51	02 Apr 2002	Case Docketed to Examiner in GAU
52	01 Apr 2002 28 Mar 2002	Case Docketed to Examiner in GAU
53	26 Mar 2002	Case Docketed to Examiner in GAU
54	25 Mar 2002	
55	19 Feb 2002	Correspondence Address Change Mail Advisory Action (PTOL - 303)
56	19 Feb 2002 19 Feb 2002	, , , ,
57	17 Jan 2002	Advisory Action (PTOL-303) Date Forwarded to Examiner
58	10 Jan 2002	
59	15 Jan 2002	Response after Final Action Mail Examiner Interview Summary (PTOL - 413)
	08 Jan 2002	Examiner Interview Summary Record (PTOL - 413)
60 61	10 Oct 2001	
62	09 Oct 2001	Mail Final Rejection (PTOL - 326)
63	05 Oct 2001	Final Rejection
		Miscellaneous Incoming Letter Change in Power of Attorney (May Include Associate POA)
64	26 Sep 2001	
65	26 Sep 2001	Correspondence Address Change
66 67	26 Sep 2001	Change in Power of Attorney (May Include Associate POA) Date Forwarded to Examiner
	26 Sep 2001	
68 69	21 Sep 2001 20 Jun 2001	Response after Non-Final Action Correspondence Address Change
70		Information Disclosure Statement (IDS) Filed
71	30 Apr 2001 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 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 MailedApplication IncompleteFiling Date Assigned
89	12 May 2000	Correspondence Address Change
90	07 Apr 2000	IFW Scan & Amp; PACR Auto Security Review
91	13 Mar 2000	Initial Exam Team nn
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 $[\]delta$ Transaction Sequence Number (SEQ.) is unrelated to Paper Number in File Table of contents.



Page 2 of 2

US Patent & Trademark Office

US 6,742,021 Assignment History*

Assignment: 1 / 2								
Reel / Frame:	011015/0897	Recorded:	08/21/2000	Pages	in docum	ent:	4	
Conveyance:	ASSIGNMENT OF ASSIG	NORS INTEREST (SEE	DOCUMENT FOR	R DETAILS).				
Assignors:	Julia, Luc				Exec. Dt:	06/2	20/2000	
	Voutsas, Dimitris				Exec. Dt:	06/1	6/2000	
	Cheyer, Adam				Exec. Dt:	06/2	2/2000	
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	MENLO PARK, CALIFORNIA 94025							
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	P.O. BOX 52037							
	PALO ALTO, CA 94303-	-0746						
Assignment:	2/2							
Reel / Frame:	039857/0097	Recorded:	09/26/2016	Pages	in docum	ent:	5	
Conveyance:	ASSIGNMENT OF ASSIG	NORS INTEREST (SEE	DOCUMENT FOR	R DETAILS).				
Assignor:	Sri International				Exec. Dt:	05/2	20/2016	
Assignee:	IPA TECHNOLOGIES INC							
	600 ANTON BLVD.							
	SUITE 1350							
	COSTA MESA, CALIFORNIA 92626							
Correspondent:	IPA TECHNOLOGIES INC							
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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 # 6742021

APPLICATION # 09524095

FILING DATE 03/13/2000

ISSUE DATE 05/25/2004

Payment Window Status

WINDOW 11.5 Year		STATUS Closed		FEES 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

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P.O. Box 1450, Alexandria, VA 22313-1450 • www.uspto.gov

No maintenance fees are due.

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70% RIP. Class Subclass SSUE CLASSIFICATION	PATENT NUMBER 6742021
709 709 Class* ISSUE CL	6.4282
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	O.I.P.E. PATENT DATE
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X	(Primary Examiner) (Date)	070786 3-2408
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	stricted. Unauthorized disclosure may be prohibited by the mark Office is restricted to authorized employees and contro	United States Code Title 35 Sections 122, 181 and 368. actors only.
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DISH, Exh. 1002, p. 5

PATENT APPLICATION

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INITIALS ROD 4-1-2900

CONTENTS

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1/	Application papers.		42			
2.1	1 FR Derl	5/12/00	43		<u>.</u>	
3.)	FOT April Sm Entry	8/21/60	44			
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18.	Key. for reconsideration		59			
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21/	interview summary	1-15-02	62		· · · · · · · · · · · · · · · · · · ·	
22.	Reg Ti- Reconsideration		63			
23. 4.2	Advisory Action	2-19-02				-
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FORMALITY REVIEW		71476	5/12/01
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INDEX OF CLAIMS

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SERIAL NUMB 09/524,095	09/524,095 RULE			CLASS 709	GROUP ART UNIT 2155			ATTORNEY DOCKET NO. SRI1P037		
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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.



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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 underconstrained requests ("Show me the Clint Eastwood movie"). An approach is needed for handling and resolving such errors and ambiguities in a rapid, user-friendly, nonfrustrating 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.

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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 ambiguitles 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.

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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

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

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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

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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



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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

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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 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.



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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

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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

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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

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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 ATIS" which Processing for is currently available online 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



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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 mavigational 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

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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 substep 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,



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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-ondemand 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

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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



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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 Step 407 detects no obvious problems, and so the query is director fields. 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

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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. 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.

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3. Open Agent Architecture (OAA®)

Open Agent ArchitectureTM (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 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 Figure 13 and the corresponding discussion of a "multi-modal maps" application, and Figure 12 and the

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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

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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	1.	A method for utilizing spoken natural language for navigating an	
2	electronic data source, the electronic data source being located at one or more network		
3	servers locate	d remotely from a user, comprising the steps of:	
4	(a)	receiving a spoken natural language ("XL") request for desired	
5		information from the user;	
6	(b)	rendering an interpretation of the spoken natural language request;	
7	(c)	constructing at least part of a navigation query based upon the	
8		interpretation;	
9	(d)	soliciting additional input from the user, including user interaction in a	
0	``	modality different than the original request;	
1	(e)	refining the navigation query, based upon the additional input;	
12	(f)	using the refined navigation query to select a portion of the electronic	
13		data source; and	
4	(g)	transmitting the selected portion of the electronic data source from the	
15		network server to a client device of the user.	
1	2.	The method of claim 1, wherein the step of rendering an interpretation	
2	further includ	es deriving linguistic information by using a speech recognition engine	
3	and an NL pa	rser.	
1	3.	The method of claim 1, wherein the step of constructing a navigation	
2	query further	includes the steps of extracting an input template for an online scripted	
3	interface to th	data source, and using the input template to construct the navigation	

1	4.	The method of claim 3, wherein the step of extracting an input
2	template inclu	ides dynamically scraping the online scripted interface.
1	5.	The method of claim 1, wherein the navigation query is constructed in
2	the format of	a database query language.
1	6.	The method of claim 1, wherein the step of rendering an interpretation
2	and the step o	f constructing a navigation query are performed, at least in part, on a
3	computing de	vice located locally with the user.
1	7.	The method of claim 1, wherein the step of rendering an interpretation
2	and the step o	f constructing a navigation query are performed, at least in part, on a
3	network comp	outing device located remotely from the user.
1	8.	The method of claim 1, wherein the step of soliciting additional input
2	is performed i	in response to one or more deficiencies encountered during the step of
3	constructing a	navigation query.
1	9.	The method of claim 8, wherein the deficiencies include unresolved
2	words of the s	spoken NL request.
1	10.	The method of claim 8, wherein the deficiencies include one or more
2	required elem	ents of the navigational query not determinable from the interpretation
3	of the spoken	NL request.
1	11.	The method of claim 1, wherein the step of soliciting additional input
2	is performed i	n response to one or more deficiencies encountered after a first
3	navigation of	the data source using the navigation query constructed in step (c).
1	12.	The method of claim 1, wherein the deficiencies include existence of
2	more than one	e daya record within the data source responsive to the navigation query.
1	13.	The method of claim 11, wherein the deficiencies include failure to
2	identify a sing	le data record within the data source responsive to the navigation query.
1	14.	The method of claim 1, wherein the input modality of step (d) includes
2	selecting from	a displayed option menu.

1	15.	The method of claim 14, wherein the act of selecting from the
2	displayed opt	ion menu is performed by speaking.
1	16.	The method of claim 1, wherein the method is performed with respect
2	to a plurality	of simultaneous users and corresponding client devices.
1	17.	The method of claim 1, further including the step of selecting the data
2	source from a	among a plurality of candidate electronic data sources, in response to the
3	interpretation	of the spoken NL request.
1	18.	The method of claim 1, wherein the electronic data source stores
2	multimedia c	ontent including at least one of video content and audio content.
1	19.	A system for utilizing spoken natural language to navigate an
2	electronic dat	a source, the electronic data source being located at one or more network
3	servers locate	ed remotely from a user, the system comprising:
4	(a)	a portable microphone operable to receive a spoken natural language
5	,	("NL") request for desired information from the user;
6	(b)	spoken language processing logic, operable to render an interpretation
7		of the spoken natural language request;
8	(c)	query construction logic, operable to construct a navigation query in
9		response to the interpretation of the spoken natural language request;
10	(d)	user interaction logic, operable to solicit additional input from the user
11		including user interaction in a modality different than the original
12		request;
13	(e)	query refining logic, operable to refine the navigation query, based
14		upon the additional input;
15	(f)	navigation logic, operable to select a portion of the electronic data
16	(1)	source using the navigation query; and
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17	(g)	electronic communications infrastructure for transmitting the selected
18		portion of the electronic data source from the network server to a
19		primarily stationary, display device located locally with the user.
1	20.	The system of claim 19, wherein the spoken language processing logic
2	includes spee	ch recognition logic and an NL parsing logic for deriving linguistic
3	information.	
1	21.	The system of claim 19, wherein the spoken language processing logic
2	extracts an in	put template for an online scripted interface to the data source, and uses
3	the input temp	plate to construct the navigation query.
1	22.	The system of claim 21, wherein the spoken language processing logic
2	dynamically s	scrapes the online scripted interface.
1	23.	The system of claim 19, wherein the query construction logic
2	constructs the	query in the format of a database query language.
1	24.	The system of claim 19, wherein at least a portion of the spoken
2	language proc	cessing logic is hosted on a computing device located locally with the
3	user, and whe	rein the portable microphone is electronically coupled to the local
4	computing de	vice.
1	25.	The system of claim 19, wherein at least a portion of the spoken
2	language proc	cessing logic is hosted on a network computing device located remotely
3	from the user	, and wherein the portable microphone sends data to the remote network
4	computing de	vice via the communications infrastructure.
1	26	The system of claim 19, wherein the user interaction logic solicits

The system of claim 26, wherein the deficiencies include unresolved

additional input in response to one or more deficiencies encountered during

construction of the navigation query.

words of the spoken NL request.

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1	28.	The system of claim 26, wherein the deficiencie	es include one or more
2	required eleme	ents of the navigational query not determinable f	rom the interpretation
3	of the spoken	NL request.	

- 1 29. The system of claim 19, wherein the user interaction logic solicits 2 additional input in response to one or more deficiencies encountered after a first 3 navigation of the data source performed by the navigation logic.
- 1 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.
- 1 31. The system of claim 29, wherein the deficiencies include failure to 2 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.
- 1 36. The system of claim 19, wherein the display device receives data from 2 the electronic data source on the network servers via a communications box.
- 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}.
- 1 38. An computer program embodied on a computer readable medium for utilizing spoken natural language for navigating an electronic data source, the

3	electronic data source being located at one or more network servers located remotely		
4	from a user, comprising:		
_			
5	(a) ·	a code segment that receives a spoken natural language ("NL") request	
6		for desired information from the user;	
. 7	(b)	a code segment that renders an interpretation of the spoken natural	
8	(-)	language request;	
Ü			
9	(c)	a code segment that constructs at least/part of a navigation query based	
10		upon the interpretation;	
11	(d)	a code segment that solicits additional input from the user, including	
12		user interaction in a modality different than the original request;	
13	(e)	a code segment that refines the navigation query, based upon the	
14		additional input;	
15	(f)	a code segment that uses the refined navigation query to select a	
16		portion of the electronic data source; and	
		portion of the cross of the control, the control of	
17	(g)	a code segment that transmits the selected portion of the electronic data	
18		source from the network server to a primarily stationary, display	
19		device located locally with the user.	
1	39.	The computer/program of claim 38, further comprising a code segment	
2	that derives l	inguistic information by using a speech recognition engine and an NL	
3	parser.		
	40		
1	40.	The computer program of claim 38, further comprising a code segment	
2	that extract a	n input template for an online scripted interface to the data source, and a	
3	code segmen	t that uses the input template to construct the navigation query.	
1	41.	The computer program of claim 40, further comprising a code segment	
2	that dynamic	ally scrapes the online scripted interface.	
1	42	The computer program of claim 38, wherein the navigation query is	

constructed in the format of a database query language.

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

- 1 44. The computer program of claim 38, wherein the rendering of the 2 interpretation and the construction of a navigation query are performed, at least in 3 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.
- 1 50. The computer program of claim 48, wherein the deficiencies include 2 failure to identify a single data record within the data source responsive to the 3 navigation query.
- 1 51. The computer program of claim 38, wherein code segment that solicits additional input displays an option menu.
- 1 52. The computer program of claim 51, wherein the act of selecting from 2 the displayed option menu is performed by speaking.

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1	53. The computer p	rogram of claim 38, who	erein the code segments of the
2	computer program operate with	respect to a plurality of	f simultaneous users and
3	corresponding client devices.		

- 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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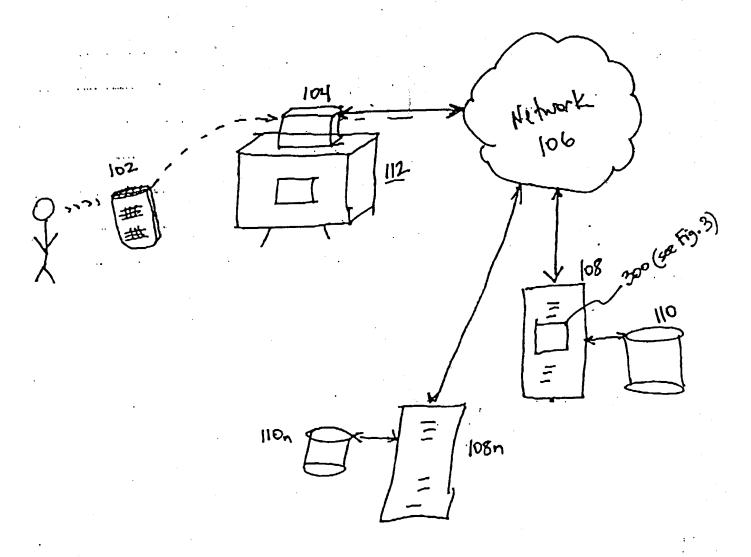


Fig. 1a

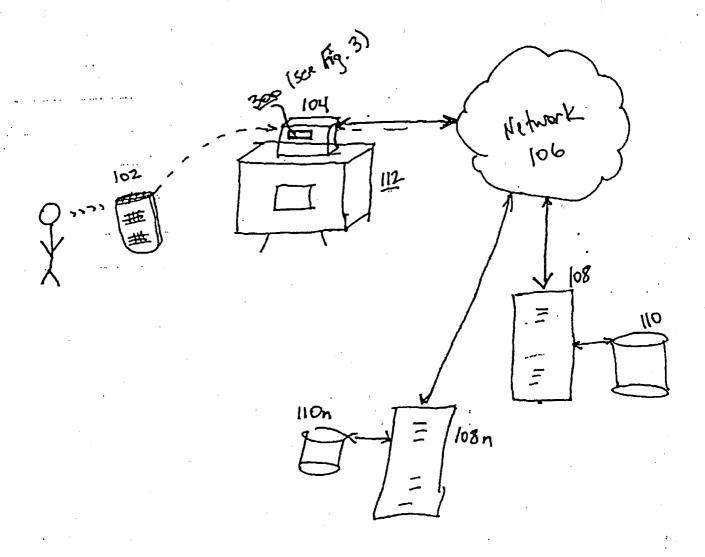


Fig. 10

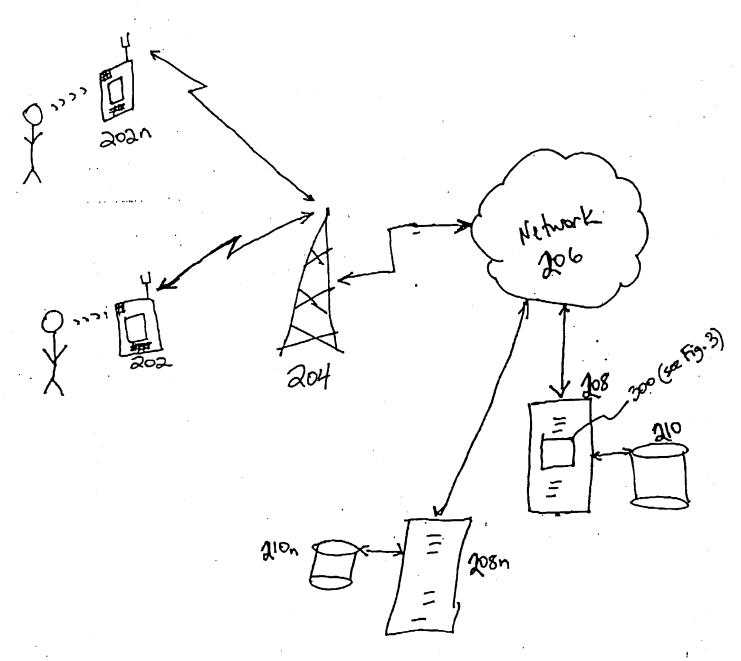


Fig. 2

Request Processing logic 300

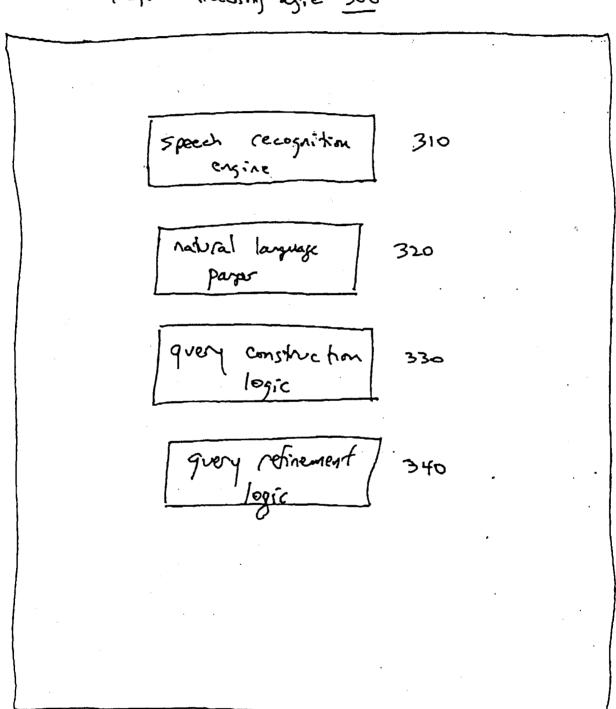


Fig. 3

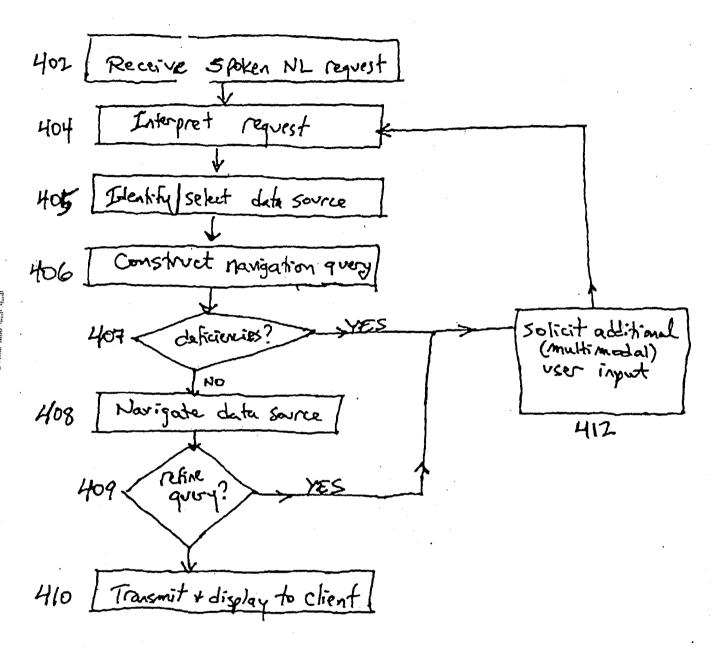


Fig.4

(from step 406, fig. 4)

Scrape the online scripted form,
to extract an input template

instantiate the input template,
using interpretation of step 404 522

(to step 407, Big. 4)

Fiz. 5

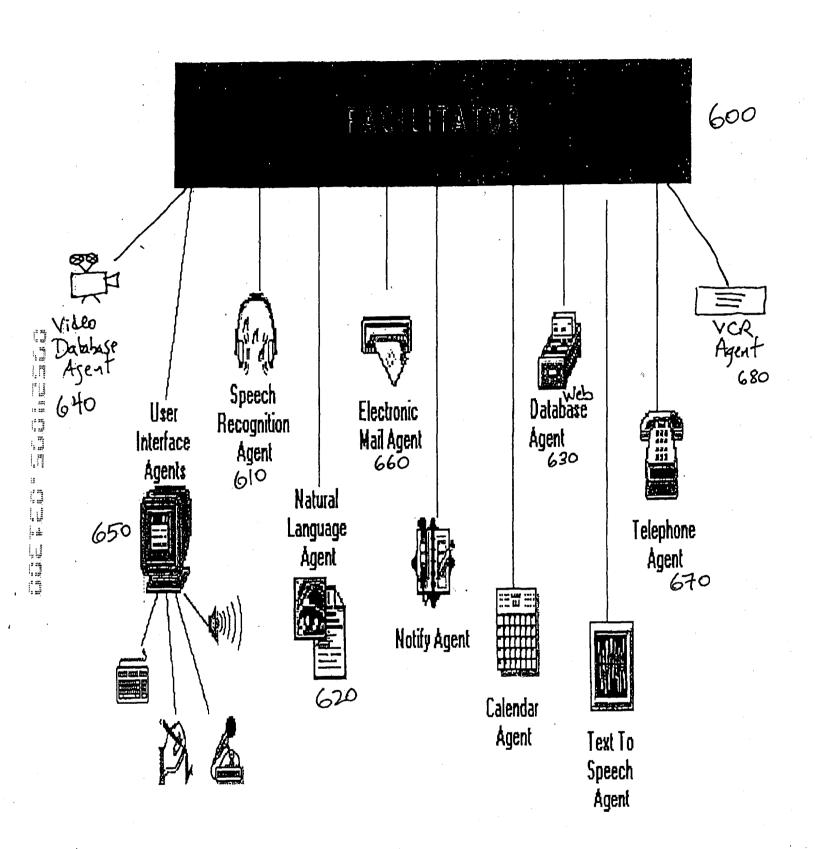


Fig. 6

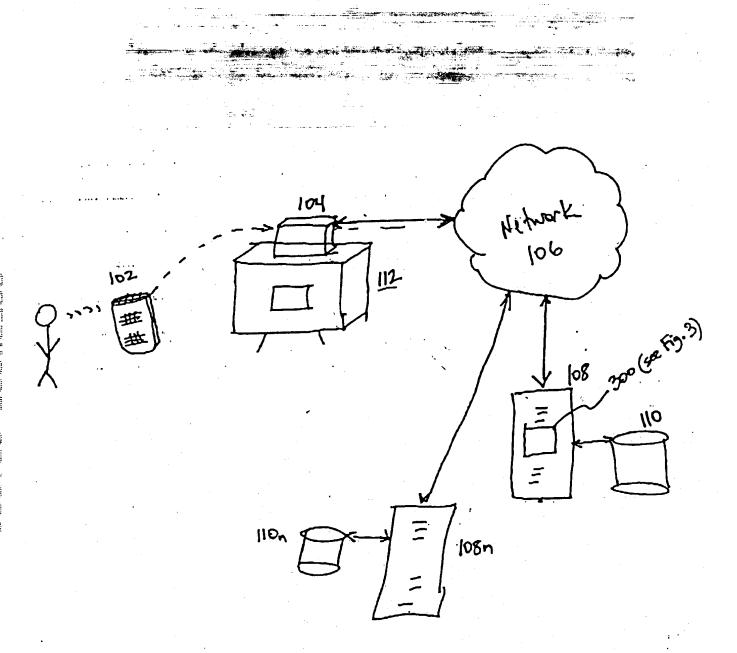


Fig. 1a

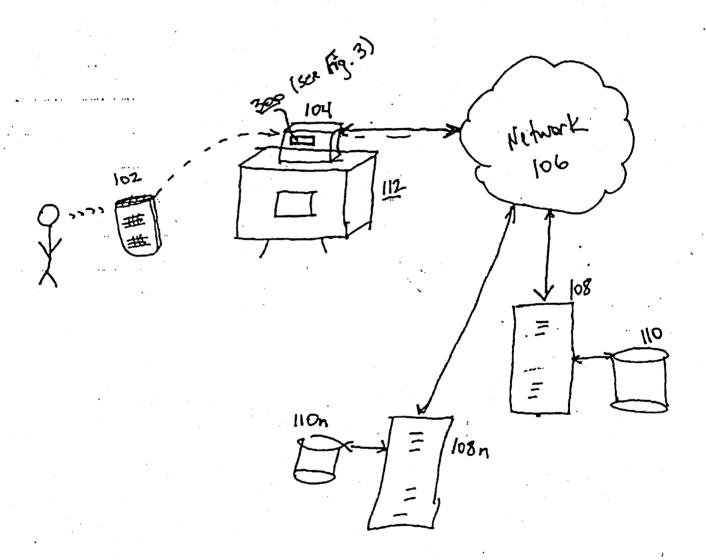


Fig. 15

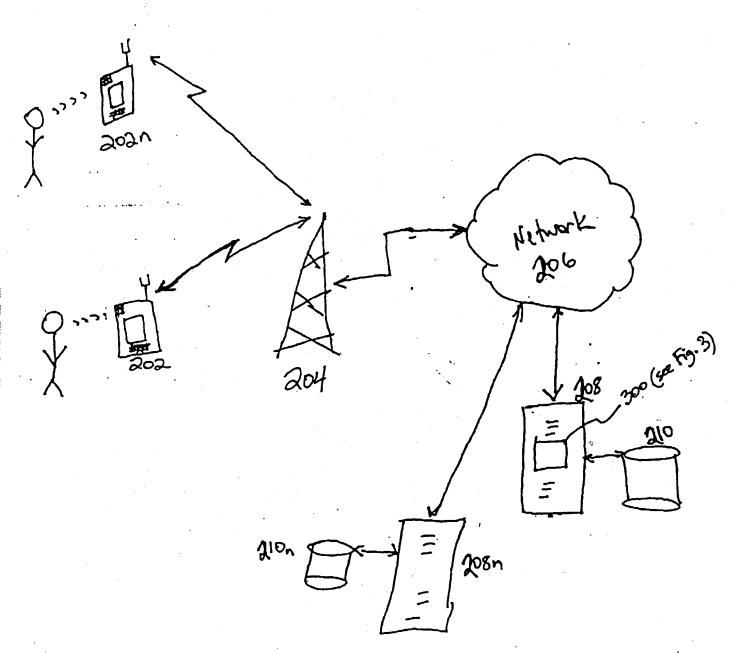


Fig. 2

Request Processing Logice 300

. •	speech recognition 3 engine	510
	natural language 32.	o
	query construction 37	3
	guery refinement 3	40
		•

Fig. 3

Fig.4

scrape the online scripted form, to extract an input template

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instantiate the input template, using interpretation of step 404

522

(to step 407, Fig. 4)

Fiz. 5

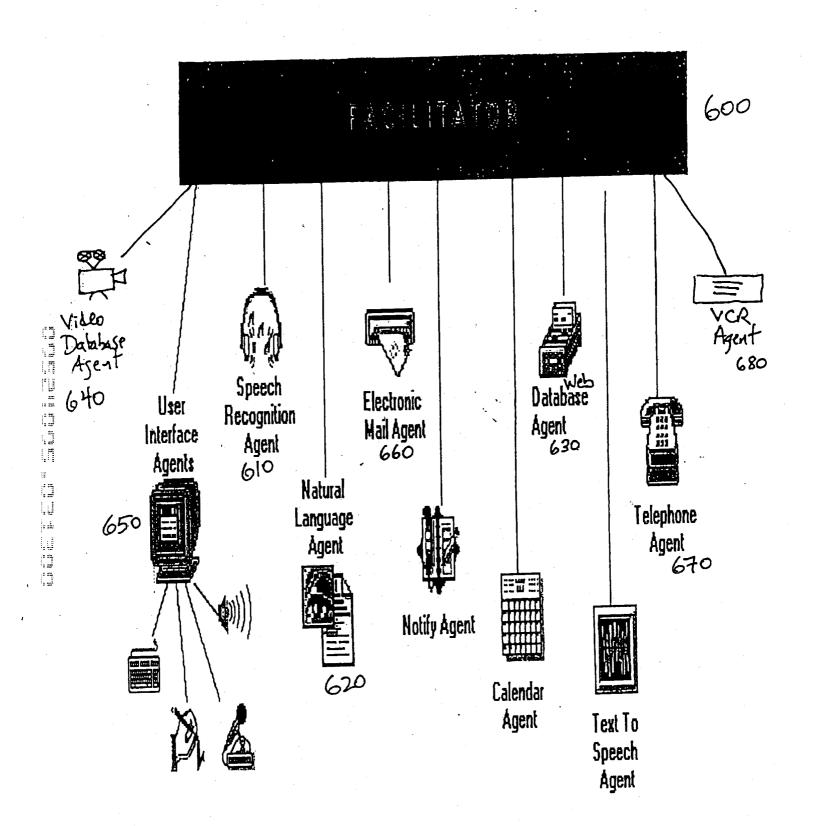


Fig. 6

Jc586 U.S. PTG

3-15-00

N 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



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

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

Box Pate	ent Commissioner for Patents ent Application gton, DC 20231		Duplicate for fee processing
Sir: 7	This is a request for filing a patent application. Christin	n under 37 CFR. § 1.53(e Halverson	b) in the name of inventors:
NATUR	NAVIGATING NETWORK-BASED ELE RAL LANGUAGE INPUT WITH MULTI		
	This application is a Continuation	Divisional	Continuation-in-par
	Application No.: 09/225,198, from which pution Elements:	riority under 35 U.S.C. §	120 is claimed.
c	33 Pages of Specification, Claims and 07 Sheets of Drawings Combined Declaration and Power of Newly executed (original or copy) Copy from a prior application (37 CFR disclosure of the prior application from which considered as being part of the disclosure of incorporated by reference therein. Deletion of inventors Signed statemen application, see 37 CFR	of Attorney 1.63(d) for a continuation the accompanying application	on is herein supplied is ation and is hereby tor(s) named in the prior
Accomp	panying Application Parts:		
	Assignment and Assignment Recordati Power of Attorney 37 CFR 3.73(b) Statement by Assignee Information Disclosure Statement with	,	ng fee of \$40.00 enclosed) Copies of IDS Citations
(Revised 12	2/97, Pat App Trans 53(b) ContDivCIP)	Page 1 of 3	

DISH, Exh. 1002, p. 63

Preliminary Amendm. New claims application.) Return Receipt Postcard Small Entity Statement(s) Statement desired. Other:	numbered after highes nent filed in prior appli		
Claim For Foreign Priority			•
Priority of Application No 35 U.S.C. § 119. The certified copy has been filed			
The certified copy will follow.			
Extension of Time for Prior Pending Application	•		
A Petition for Extension of Time is being co application. A copy of the Petition for Extension for Extension of Time is being co application. A copy of the Petition for Extension for Extension of Time is being co	•		
Amend the specification by inserting before Continuation application of copending prior Application No. International Application designated the United States, the disclosure of which is incorporate Cancel in this application original claims before calculating the filing fee. (At least or	ontinuation-in-part filed on filed on ed herein by reference of the prior ap	Divisiona which pplication	
Fee Calculation (37 CFR § 1.16)			
(Col. 1) (Col. 2) NO. FILED NO. EXTRA BASIC FEE TOTAL CLAIMS	SMALL ENTITY RATE FEE \$345 \$345. x09 = \$ x39 = \$ \$130 = \$ Total \$	OR OR OR OR OR OR OR	<u>RATE FEE</u> \$690 \$ x18 = \$ x78 = \$ \$260 = \$ Total \$
Check No in the amount of \$	is enclosed.		
The Commissioner is authorized to charge any required, or to credit any overpayment, to Deposit A (Revised 12/97, Pat App Trans 53(b) ContDivCIP)			

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:

Palo Alto, California 94303-0746 (408) 558-9950

Customer No.::

Date: <u>March 13, 2000</u>

Dominic M. Kotab Registration No. 42,762

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

03/29/2000 SDAVIS 00000028 500384 09524095

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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

1 of 1

MOEMA In re the application of

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Luc Julia et al.

Application No. 09/524,095

Filed: 3/13/2000

For:

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

Examiner: Not Assigned

Art Unit: Not Assigned

Atty. Docket No. AND1P037

Date: 8/17/00

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.

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

Raymond E. Roberts Reg. No. 38,597

P.O. Box 52037 Palo Alto, CA 94303-0746

(408) 558-9950

Attorney Docket No. SRI1P037

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of)
Luc Julia et al.) Examiner: Not Assigned) 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 MAITING

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.

Kimberly Main

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.

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. <u>SRI1P037</u>). 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

	DE(FO)			POWER OF PATENT AP		NEY ION	0	1
As a below-named inv	entor, I her	eby declare that:					S Docket, No. SRI	1P057
My residence, post off	ice address	and citizenship a	re as stated	below next to my n	ame.	AUG AUG	2 1 2000	
I believe that I am the plural names are listed NAVIGATING NETWOODA	below) of work-BA	the subject matter SED ELECTRO	which is c	laimed and for whic DRMATIN USING	h a patent is s	ought on th	de invention entit	led:
(check one)	1. 🔲	is attached here	eto.		•			
	2. 🔀	was filed on U.S. Application and was amend	n Serial N		ns 5	·	•	
	3.	was filed on International Po and was amend		ation Serial No.		as 		
I hereby state that I hammended by any amended			d the cont	ents of the above-io	lentified spec	ification, i	ncluding the clai	ms, as
I acknowledge the dut 37, CFR § 1.56.	y to disclos	se information wh	nich is mat	erial to the examinat	ion of this ap	plication is	n accordance with	h Title
I hereby claim foreign for patent or inventor's than the United States inventor's certificate, claimed: Prior Foreign Application	s certificates, listed be or PCT Int	e, or § 365(a) of a clow and have id	any PCT In entified be	nternational applications, by checking t	ion which des he box, any	signated at foreign ap e application Priority	least one country polication for pat on on which price Benefits Claimed	other ent or ority is
(Appl. No.)		(Country)		(Filing Date)		∐ Y es	□No	
			<u> </u>			Yes	□No	
(Appl. No.)		(Country)		(Filing Date)				
(Appl. No.)		(Country)		(Filing Date)		∐Yes	□No	
I hereby claim the bene	efit under 3	5 U.S.C. §119(e)	of any Un	ited States provision	al application	(s) listed be	elow:	
(Application Serial No	.)	(Filing	g Date)	_				
(Application Serial No								
	.)	(Filing	Date)	_				
International application application is not discussion is not discussion of Title 35 patentability as defined	efit under on designation to the second in the second in the second in Title 3 d in Title 3	Title 35, United Stands the United Stands of United States Code, § 137, Code of Feder	tates Code ates, listed States or F 12, I ack al Regulat	PCT International apmowledge the duty ions, § 1.56 which be	s the subject of oplication in to disclose of occame availa	matter of eather the manne information	ach of the claims r provided by th n which is mate	of this e first rial to
I hereby claim the ben International application application is not discusted paragraph of Title 35 patentability as defined prior application and the	efit under on designation to the second in the second in the second in Title 3 d in Title 3	Title 35, United Stands the United Stands of United States Code, § 137, Code of Feder	tates Code ates, listed States or F 12, I ack al Regulat	below and, insofar a PCT International ap- nowledge the duty ions, § 1.56 which b	s the subject of oplication in to disclose of occame availa	matter of eather the manne information	ach of the claims r provided by th n which is mate	of this e first rial to

(Application Serial No.)	(Filing Date)	(Status - patented, pending, al	pandoned) AME 2 1 200
Application Serial No.)	(Filing Date)	(Status - patented, pending, al	pandoned)
Keith Stephens (Reg. No. 32 Melton (Reg. No. 32,276); R Reg. No. 40,008); Douglas No. P46,327); Stefanie M. H	firm of Hickman Stephens Coleman & 2,632); Brian R. Coleman (Reg. No. Raymond E. Roberts (Reg. No. 38,55°) E. Mackenzie (Reg. No. 38,955); Millowell (Reg. No. P45,929); and Robe to transact all business in the Patent and	39,145); Michael J. Hughes (Re 7); Vidya R. Bhakar (Reg. No. 4 chael D. Plimier (Reg. No. 43,00 rt D. Hayden (Reg. No. 42,645)	g. No. 29,077); Michael 2,323); Larry B. Guernso (4); Ronald B. Feece (Re as my principal attorneys
Send Correspondence To:	HICKMAN STEP P.O. BOX 52037 Palo Alto, Califori	HENS COLEMAN & HU	GHES, LLP
Direct Telephone Calls To:	Raymond E. Roberts	at telephone number (408) 558-9	9950
pelief are believed to be true; ike so made are punishable b such willful false statements n	ments made herein of my own knowle and further that these statements were by fine or imprisonment, or both, unde may jeopardize the validity of the appli	made with the knowledge that wir section 1001 of Title 18 of the	Iful false statements and the Juited States Code, and the
Typewritten Full Name of Sole or First Inventor:	Christine Halverson	Citizenship:	USA
	Muitin Atlabuerson	Date of Signature:	6-16-00
nventor's signature: 💹	THURST VOTE TO THE		
$\overline{\mathcal{V}}$	San Jose	(State/Country)	California/USA
Residence: (City) Post Office Address:	San Jose 1623 Fairorchard Avenue, San J	(State/Country)	California/USA
Residence: (City) Post Office Address: Full Name of Second Joint		(State/Country)	California/USA USA
Cesidence: (City) Cost Office Address: Cull Name of Second Joint Inventor (if any):	1623 Fairorchard Avenue, San J	(State/Country) ose, California 95125	USA
Residence: (City) Post Office Address: Full Name of Second Joint niventor (if any): Inventor's signature:	1623 Fairorchard Avenue, San J	(State/Country) ose, California 95125 Citizenship:	USA
Residence: (City) Post Office Address: Full Name of Second Joint nventor (if any): nventor's signature: Residence: (City)	1623 Fairorchard Avenue, San J Luc Julia	(State/Country) ose, California 95125 Citizenship: Date of Signature: (State/Country)	USA 6.21.00
Residence: (City) Post Office Address: Full Name of Second Joint nventor (if any): nventor's signature:	Luc Julia Menlo Park	(State/Country) ose, California 95125 Citizenship: Date of Signature: (State/Country)	USA 6.21.00
Residence: (City) Post Office Address: Full Name of Second Joint nventor (if any): nventor's signature: Residence: (City) Post Office Address:	Luc Julia Menlo Park 607 Menlo Avenue, Menlo Park	(State/Country) ose, California 95125 Citizenship: Date of Signature: (State/Country) , California 94025	USA 6.21.00 California/USA
Residence: (City) Post Office Address: Full Name of Second Joint nventor (if any): nventor's signature: Residence: (City) Post Office Address: Full Name of Third Joint nventor (if any): nventor's signature:	Luc Julia Menlo Park 607 Menlo Avenue, Menlo Park	(State/Country) ose, California 95125 Citizenship: Date of Signature: (State/Country) , California 94025 Citizenship:	USA 6.21.00 California/USA Greece

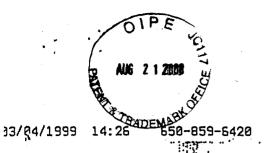
Attny Docket No. SRI1P037 Page 2 of 3

Prior U.S. Application(s)	,	
(Application Serial No.)	(Filing Date)	(Status - patented, pending, abandoned 2 1 2000
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(Application Serial No.)	(Filing Date)	(Status - patented, pending, abandoned)
Keith Stephens (Reg. No. Melton (Reg. No. 32,276) (Reg. No. 40,008); Dougl No. P46,327); Stefanie M	. 32,632); Brian R. Coleman (Reg. No. 38,597); Raymond E. Roberts (Reg. No. 38,597) as E. Mackenzie (Reg. No. 38,955); Mil. Howell (Reg. No. P45,929); and Robe and to transact all business in the Patent and	& Hughes, including Paul L. Hickman (Reg. No. 28,516); L. 39,145); Michael J. Hughes (Reg. No. 29,077); Michael E. 7); Vidya R. Bhakar (Reg. No. 42,323); Larry B. Guernsey chael D. Plimier (Reg. No. 43,004); Ronald B. Feece (Reg. rt D. Hayden (Reg. No. 42,645) as my principal attorneys to nd Trademark Office connected therewith:
Send Correspondence To	HICKMAN STEP P.O. BOX 52037 Palo Alto, Californ	HENS COLEMAN & HUGHES, LLP
Direct Telephone Calls T	Raymond E. Roberts	at telephone number (408) 558-9950
belief are believed to be tra like so made are punishab	ue; and further that these statements were	edge are true and that all statements made on information and made with the knowledge that willful false statements and the r section 1001 of Title 18 of the United States Code, and that cation or any patent issuing thereon.
Typewritten Full Name of Sole or First Inventor:	Christine Halverson	Citizenship: USA
Inventor's signature:	Muistine Atlawerson	Date of Signature: 6-16-00
Residence: (City)	San Jose	(State/Country) California/USA
Post Office Address:	1623 Fairorchard Avenue, San J	ose, 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:	1 mphone	Date of Signature: 6/16/60
Residence: (City)	Thessaloniki	(State/Country) Greece
Post Office Address:	14 M. Pyrza Street, Neoi E	pivates, Thessaloniki 57019, Greece
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Auny Docket	No. SRI1P037 Page 2 of	ט

Full Name of Fourth Joint Inventor (if any):	A Cheyer *	Citizen. USA
Inventor's signature:	aden 1. Cheza	Date of Signature: 6/22/00
Residence: (City)	Palo Alto	(State/Country) <u>California</u> /USA
Post Office Address:	757 Cereza Drive, Palo Alto,	California 94306

Attny Docket No. SRI1P037

Page 3 of 3



SRI PATENT OFFICE

PAGE 02

HS&C Docket No. SRITP016 SRI Docket No. US39452

PATENT

VÉRIFIED STATEMENT CLAIMING SMALL-ENTITY STATUS (37. CFR 1.9(f) & 1.27(d))-NONPROFIT ORGANIZATION

Applicant or Patentees Serial or Patent No.: Filed or Issued: Title:	January 5, 1999 SOFTWARE-BASED ARCHI	TECTURE FOR COMMUNICATION AND STRIBUTED ELECTRONIC AGENTS
I hereby declare that hereby declare that hereby	n an official empowered to act	on behalf of the nonprofit organization identified
	ROFIT ORGANIZATION: IONPROFIT ORGANIZATION:	SRI International 333 Ravenswood Avenue Menio Park, CA 94025-3493
TYPE OF NONE	ROFIT ORGANIZATION:	Weno Park, CA 94025-5495
UNIVERS	OR OTHER INSTITUTION	OF HIGHER EDUCATION
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(CITATIO WOULDIO	ON OF STATUTE: Section UNLIFY AS TEXT-EXEMPT U	ns 5110 et seq., California Corporations Code) NDER INTERNAL REVENUE SERIVCE CODE FED IN THE UNITED STATES OF AMERICA
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the specific	ation filed herewith with title as	listed above.
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organization regarding the not exclusive, each individual	e above-identified invention. If the above-identified invention. If the above-identified invention is a second and the above-identified invention.	een conveyed to and remain with the non-profit the rights held by the nonprofit organization are aving rights in the inven-tion must file separate es 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

Page 1/2



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NAME	OF PERSO	N SIGNING:	Mary Lou J	oyner			
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ADDRE	SS OF PER	RSONISIGNING:	333 Raven	swood Ave.,	Menlo Park, CA	94025-3493	
SIGNAT	1185.	Wart	ton			DATE: March	. 4 1000
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PATENT 7

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Adam J. CHEYER et al.

Serial No.

09/225,198

Filed:

January 5, 1999

For: SOFTWARE-BASED ARCHITECTURE FOR COMMUNICATION AND COOPERATION

AMONG DISTRIBUTED ELECTRONIC

AGENTS

Group Art Unit: 2755

Examiner: Not Assigned

Attorney Docket No. (SRI1P016)

Date: March 5, 1999

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: Japan Vane

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.

DISH, Exh. 1002, p. 78



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



UNITED-STATES DEHARTMENT OF CONTRICTOR

Address: COMMISSIONER OF PATENTS AND TRADEMARKS Washington, D.C. 20231

FINA

ONTHLY STATEMENT F DEPOSIT ACCOUNT

replenish your Deposit Account, detach and urn top portion with your check. Make check able to Commissioner of Patents & Trademarks.

HICKMAN & MARTINE LLP HUSAM Y HAMMAD 200 PAGE MILL ROAD, SUITE 100

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PLEASE SEND REMITTANCES TO: Patent and Trademark Office P.O. Box 70541 Chicago, Ill. 60673

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By: BRC/jv Filing Date:	January 5, 1999 Express M	Iail No.z.
Inventor(s): Adam J. Cheyer et	al.	
Title: SOFTWARE-BASED AF COOPERATION AMON	RCHITECTURE FOR COMMU G DISTRIBUTED BLECTRON	NICATION AND IIC AGENTS

The following has been received in the U.S. Patent & Trademark Office on the date stamped below:

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- Request for Refund
 Verified Statement Claiming Small-Entity Status
 Monthly Statement of Deposit Account dated 1/29/99



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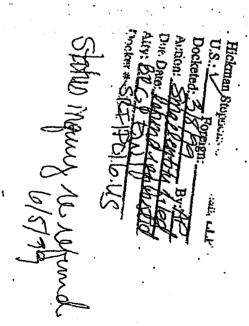


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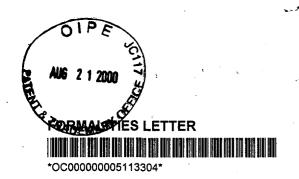
Docket No. SRI1P016 Appln. No.: 09/225,198 Date March 5, 1999								
By: BRC/jv Filing Date: January 5, 1999 Express Mail No.:								
Inventor(s): Adam J. Cheyer et al.								
Title: SOFTWARE-BASED ARCHITECTURE FOR COMMUNICATION AND COOPERATION AMONG DISTRIBUTED ELECTRONIC AGENTS								

The following has been received in the U.S. Patent & Trademark Office on the date stamped below:

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 Request for Refund
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09/524,095



03/13/2000

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

Christine Halverson

Hickman Stephens Coleman & Hughes LLP PO Box 52037 Palo Alto, CA 94303-0746

Date Mailed: 05/12/2000

SRI1P037

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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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

10/31/00

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

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 AA system, method, and article of manufacture are provided for navigating an electronic data source by means of spoken language.

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DISH, Exh. 1002, p. 84

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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.

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.

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:

(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.

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(New) 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. (New) 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. (New) The method of claim 3, wherein the step of extracting an input template ncludes dynamically scraping the online scripted interface. 56 60 (New) The method of claim 1/2, whereigh the navigation query is constructed in the format of a database query language. 61 (New) 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. (New) 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. (New) 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. *(*04 (New)/The method of claim &, wherein the deficiencies include unresolved words of the spoken request. 105 (New) The method of claim & wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken request.

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DISH, Exh. 1002, p. 87

(New) 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).

(New) 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.

(New) 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. (New) The method of claim 1, wherein the additional input is solicited upon receiving a user-input statement that additional information is required.

15. (New) The method of claim 1, wherein the step of soliciting the additional input includes presenting a menu to the user on the chent device of the user.

16. (New) The method of claim 2, wherein the step of soliciting the additional input includes presenting a textual request for the additional input.

17. (New) The method of claim 1, wherein the step of soliciting the additional input includes an audible request for the additional input.

18. (New) 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. (New) The method of claim 1, wherein additional input received from the user is at least partially speech based.

20. (New) The method of claim \mathcal{X} , wherein additional input received from the user includes no spoken input.

(New) The method of claim 1, wherein steps (d)-(e) are repeated until the navigational query is deemed adequate.

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22. (New) The method of claim 7, wherein the input modality of step (d) includes selecting from a displayed option menu.

23. (New) The method of claim 22, wherein the act of selecting from the displayed option menu is performed by speaking.

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

(New) 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.

New) The method of claim \mathcal{J} , wherein the electronic data source stores multimedia content including at least one of video content and audio content.

(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;

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- (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. (New) The system of claim 27, wherein the language processing logic includes speech recognition logic and an linguistic parsing logic for deriving linguistic information.
- 29. (New) 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. (New) The system of claim 29, wherein the language processing logic dynamically scrapes the online scripted interface.
- 31. (New) The system of claim 21, wherein the query construction logic constructs the query in the format of a database query language.
- 32. (New) 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. (New) 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. (New) 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.
- (New) The system of claim 34, wherein the deficiencies include unresolved words of the spoken request.

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36. (New) 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.

(New) The system of claim 21, 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. (New) The system of claim 31, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

(New) The system of claim 3/1, wherein the deficiencies include failure to identify . single data record within the data source responsive to the navigation query.

40. (New) The system of claim 27, wherein the user interaction logic displays an option menu.

(New) The system of claim 40, wherein the act of selecting from the displayed option menu is performed by speaking.

42. (New) 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. (New) The system of claim 21, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

44. (New) The system of claim 27, wherein the display device receives data from the electronic data source on the network servers via a communications box.

(New) 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}.

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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
- (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. (New) 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. (New) 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.
 - (New) The computer program of claim 48, further comprising a code segment that dynamically scrapes the online scripted interface.
 - (New) The computer program of claim 46, wherein the navigation query is constructed in the format of a database query language.

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(New) 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.

(New) 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.

(New) 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. (New) The computer program of claim 53, wherein the deficiencies include unresolved words of the spoken request.

(New) 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.

(New) 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.

(New) 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.

(New) 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.

Mew) The computer program of claim 16, wherein code segment that solicits additional input displays an option menu.

(New) The computer program of claim 50, wherein the act of selecting from the displayed option menu is performed by speaking.

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01.12	9 116 51.	(New) The computer program of claim 46, wherein the code segments of the
F	computer pro	gram operate with respect to a plurality of simultaneous users and corresponding
	client devices	
	117	(New) The computer program of claim 46, further comprising a code segment
	that selects th	e data source from among a plurality of candidate electronic data sources, in
	response to th	te interpretation of the spoken request.
	118	(New) The computer program of claim 46, wherein the electronic data source
	stores multim	edia content including at least one of video content and audio content.
	119 ,64.	(New) The computer program of claim 46, wherein the additional input is
·	solicited upon 120 65.	receiving a user-input statement that additional information is required. \O\ (New) 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.	
	121	(New) The computer program of claim 46, wherein the code segment that solicits
ک	the additional	input includes a code segment that presents a textual request for the additional
<i>'</i>	input.	lọi
	67.	(New) 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. 123	(New) 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 many 124	atch the navigational query. (New) The computer program of claim 46, wherein additional input received from
	the user is at 1	east partially speech based.
	125	(New) The computer program of claim 46, wherein additional input received from
	the user inclu	des/no spoken input.

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71. (New) The computer program of claim 46, wherein code segments (d)-(e) are repeated until the navigational query is deemed adequate.

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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,

Keyin J. Zilka Registration No. 41,429

P.O. Box 721030 San Jose, CA 95172

Telephone: (408) 505-5100

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IN	THE UNITED	STATES	PATENT A	ND TRADE	MARK OFFICE

In re the application of Docket: SRI1P037A Christine HALVERSEN et al. Application No. 09/524,095 Filed: March 13, 2000 Date: June 30, 2000 NAVIGATING NETWORK BASED For: ELECTRONIC INFORMATION USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK

CERTIFICATE OF MAILING

I hereby certify that this corres dence is being deposited with the United States Postal Service Mail to: Assistant Commissioner for Patents, 20231 on June 30, 2000.

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 <u>Amendment</u>	Highest Previously Paid For Extra	Present RATE	SMALL ENTIT	Y OR	RATE	LARGE FEE	ENTITY
TOTAL CLAIMS INDEP	71	55	16	X09 = \$ 144	OR	X18 =	\$	
CLAIMS		_3	0	X39 = \$	OR	X78 =	\$	
	pendent Claim Pres	sent		\$130			\$260	
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P.O. Box 721030 San Jose, CA 95172 Telephone: (408) 505-5100

(Revised 1/96)



SECTOR **PATENT**

In re application of: Christine Halverson et al	(a)
) 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)))

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 and Trademarks,

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

Raymond E. Roberts

Reg. No. 38,597

P.O. Box 52037 Palo Alto, CA 94303-0746 (408) 558-9950

Attorney Docket No. SRI1P037

GP2758

PATENT

In the united states patent and trademark office with the application of:

Christine Halverson

Application No.: Unassigned 09524095

Atty. Docket No.: SRIE 03 Filed: 3/13/2000

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

In the united states and the patents of the patents

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

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.

Attny Dkt No. SRI1P037

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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. <u>SRI1P037</u>).

Respectfully submitted,

HICKMAN STUPHENS COLEMAN & HUGHES, LLP

L. Keith Stephens Reg. No. 32,632

P.O. Box 52037 Palo Alto, CA 94303-0746 Telephone: (408) 558-9950

Form 1449 (Modified)	Atty. Docket No.	Application No.:
	SRI1P037	Unassigned 45.14 695
Information Disclosure	Applicant:	
Statement By Applicant	Christine Halverson	22 E M
	Filing Date:	Group Art Unit:
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U.S. Patent Documents

			U.S. Pate	nt Documents		<u> </u>	
Examiner				· ·		Sub-	Filing
Initial	No.	Patent No.	Date	Patentee	Class	class	Date
F.B.	A	5,197;005	3/23/93	Schwartz et al.	364	419	
,	В	5,386,556	1/31/95	Hedin et al.	395	600	
	С	5,434,777	7/18/95	Luciw	364	419	3410
	D	5,519,608	5/21/96	Kupiec	364	419.08	
	Е	5,608,624	3/4/97	Luciw	395	794	MAY 2 5 2000
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	G	5,729,659	3/17/98	Potter	395	2.79	1
	Н	5,748,974	5/5/98	Johnson	395	759	O DEMARK OF
	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	

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Other Documents

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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.

Modi	fied)	Atty. Docket No. SRI1P037						
Information Disclosure Statement By Applicant (Use Several Sheets if Necessary)			Applicant:		Group A Unit: V			
			Filing Date: 3/13/2000					
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No.	Patent No.	Date	Patentee	Class	class	Date		
Α	5,805,775	9/8/98	Eberman et al.	395	12			
В	5,855,002	12/29/98	Armstrong	704	270			
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D	5,963,940	10/5/99	Liddy et al.	707	5	3910		
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F	6,012,030	1/4/00	French-St. George et al.	704	275	MAY 2 6 2000		
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	No. A B C D E F G H I J	No. Patent No. A 5,805,775 B 5,855,002 C 5,890,123 D 5,963,940 E 6,003,072 F 6,012,030 G 6,026,388 H I J	Formation Disclosure tement By Applicant Veral Sheets if Necessary) U.S. Pater No. Patent No. Date A 5,805,775 9/8/98 B 5,855,002 12/29/98 C 5,890,123 3/30/99 D 5,963,940 10/5/99 E 6,003,072 12/14/99 F 6,012,030 1/4/00 G 6,026,388 2/15/00 H I J	SRI1P037 Applicant: Christine Halverson Filing Date: 3/13/2000	SRI1P037 Applicant Christine Halverson Filing Date: 3/13/2000	SRI1P037 Applicant: Christine Halverson Filing Date: 3/13/2000 Unknown		

Foreign Patent or Published Foreign Patent Application

Examiner		Document	Publication	Country or		Sub-	Trans	lation
Initial	No.	No.	Date	Patent Office	Class	class	Yes	No
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Other Documents

		Other Documents
Examiner Initial	No.	Author, Title, Date, Place (e.g. Journal) of Publication
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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

In re the application of:)
Christine Halverson)
Application No.: Unassigned)
Filed: Herewith)
For: Navigating Network-Based Electronic Information Using Spoken Natural Language Input with Multimodal Error Feedback)))

Group Art Unit: Unknown

Examiner: Unknown

Atty. Docket No.: SRI1P037

Date: March 13, 2000

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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 March 13, 2000.

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Signed:

Julie A. Curts

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. <u>SRI1P037</u>).

Respectfully submitted,
HICKMAN STEPHENS COLEMAN & HUGHES, LLP

Dominic M. Kotab Reg. No. 42,762

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Form 1449 (Modified)	Atty. Docket No.	Application No.:
<u>,</u>	SRI1P037	Unassigned
Information Disclosure	Applicant:	095,24095
Statement By Applicant	Christine Halverson	•
	Filing Date:	Group Art Unit:
(Use Several Sheets if Necessary)	Herewith	Unknown

U.S. Patent Documents

Examiner						Sub-	Filing
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Foreign Patent or Published Foreign Patent Application

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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
FB	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	un	Date Considered 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.



#7/2/ PATENT B

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of	1	· .	703 X 55
)	Docket:	RECEIVED
Christine HALVERSEN et al.)	SRI1P037A	APR 1 2 2001
Application No. 09/524,095)		Technology Center 2100
Filed: March 13, 2000)	Date: September	12, 2000
For: NAVIGATING NETWORK BASED)		
ELECTRONIC INFORMATION USING SPOKEN)		
INPUT WITH MULTIMODAL)	,	
ERROR FEEDBACK)		- A
)		

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:

09/22/2000 EFLORES 00000035 09524095

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495.00 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:

SRI1P037A

<u>-1-</u>

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.
- The computer program of claim 46, wherein code segments (d)-(e) are repeated until the navigational query is deemed adequate.
- (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 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.
- (New) 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.
- (New) The method of claim 12, 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.
- (New) The method of claim 74, wherein the step of extracting an input template includes dynamically scraping the online scripted interface.
- (New) The method of claim \mathcal{H} , wherein the navigation query is constructed in the format of a database query language.
- (New) 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.
- (New) 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.
- (New) 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.

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- 80. (New) The method of claim 79, wherein the deficiencies include unresolved words of the spoken NL request.
- 81. (New) The method of claim 29, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken NL request.
- (New) The method of claim \mathcal{Z} , 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. (New) 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.
- (New) 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.
- (New) The method of claim 22, wherein the input modality of step (d) includes selecting from a displayed option menu.
- (New) The method of claim 36, wherein the act of selecting from the displayed option menu is performed by speaking.
- 87. (New) The method of claim 27, wherein the method is performed with respect to a plurality of simultaneous users and corresponding client devices.
- (New) The method of claim 22, 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.
- (New) The method of claim \mathcal{H} , wherein the electronic data source stores multimedia content including at least one of video content and audio content.
- (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
- (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.

(New) The system of claim 90, wherein the spoken language processing logic includes speech recognition logic and an NL parsing logic for deriving linguistic information.

(New) The system of claim 96, 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.

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

(New) The system of claim 90, wherein the query construction logic constructs the query in the format of a database query language.

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language proce	essing logic is hosted on a computing device located locally w	ith the user, and
wherein the po	ortable microphone is electronically coupled to the local comp	uting device.

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- (New) 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.
- (New) 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.
- (New) The system of claim 97, wherein the deficiencies include unresolved words of the spoken NL request.
- (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.
- 196. (New) The system of claim 96, 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. (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.
- 167 102. (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.
- 193. (New) The system of claim 90, wherein the user interaction logic displays an option menu.
- 189 184. (New) The system of claim 193, wherein the act of selecting from the displayed option menu is performed by speaking.

105. (New) The system of claim 96, 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.

(New) The system of claim 90, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

107. (New) The system of claim 90, wherein the display device receives data from the electronic data source on the network servers via a communications box.

(New) 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}.

(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.
- 140. (New) 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. (New) 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.
- (New) The computer program of claim 111, further comprising a code segment that dynamically scrapes the online scripted interface.
- (New) The computer program of claim 109, wherein the navigation query is constructed in the format of a database query language.
- 114. (New) 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. (New) 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.
- 171 116. (New) 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.
- (New) The computer program of claim 146, wherein the deficiencies include unresolved words of the spoken NL request.

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j18.	(New) The computer program of claim 1/6, wherein the deficiencies include	de
one or more re	quired elements of the navigational query not determinable from the	
interpretation	of the spoken NL request.	

- (New) The computer program of claim 199, 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.
- 126. (New) 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.
- (New) 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. (New) The computer program of claim 109, wherein code segment that solicits additional input displays an option menu.
- 123. (New) The computer program of claim 122, wherein the act of selecting from the displayed option menu is performed by speaking.
- 124. (New) 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. (New) 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.
- (New) The computer program of claim 109, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

REMARKS

SRI1P037A

Λ

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

Regi**strato**n No. 41,429

SIL CON VALLEY IP LAW GROUP

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		PATENT
IN THE UNITED STATES PATENT AND The re the application of	IRADEMAKA OFFICE	2155
Christine HALVERSEN et al.	Docket: SRI1P037A	RECEIVED
Application No. 09/524,095 (SEP 2 0 2000)		APR 1 2 2001
Filed: March 13, 2000	×	Technology Center 21(
For: NAVIGATING NETWORK BASED) ELECTRONIC INFORMATION USING SPOKEN) INPUT WITH MULTIMODAL) ERROR FEEDBACK)	Date: September 12, 2000	

Commissioner 12, 2000.

Signed:

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 <u>Amendment</u>	Highest Previously <u>Paid For</u>	Present <u>Extra</u>	SMALL ENTITY RATE FEE	OR	LARGE ENTITY RATE FEE
TOTAL CLAIMS INDEP	126	_71	_55	X09 = \$ 495.00 OR	X18 =	s = 203 x 85
CLAIMS	_6	_3	3	X39 = \$117.00 OR	X78 =	\$
[] Multiple Depe and Fee Not Pro		sent		\$130		\$260
	,		TOTAL	\$\$612.00		\$
	Applicant(s) be an extension is	elieve that no (ad required, Applic	ditional) Extension ant(s) hereby peti	on of time to respond to the on of Time is required; howe tion that such an extension between the extension of Time under 37	ver, if it i e granted	s determined that such and authorize the
\boxtimes	Enclosed is out	r Check No. 192	in the amount of	\$612.00 to cover the addition	nal claim	fee and/or extension of
	If the required			fees are required to facilitate at to Deposit Account No. 50		
				Respectfully sul Kevin Milka	nitted,	
*		ty it		Registration No	. 41,429	· Ng

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

(Revised 1/96)

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Attorney Docket No.: SRI1P037A (US4116-3)

IN THE UNITED STATES PATENT AND TRADEMARA

#8 Last 12-10-

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

RECEIVED

REVOCATION AND POWER OF ATTORNEY

DEC 0 8 2000

Technology Center 2100

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
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SRI INTERNATIONAL

Date: 11/20/82

By:

Edward E. Davis, Assistant Secretary

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TAMPA, FLORIDA 33

November 27, 2000

Assistant Commi Washington, DC 20231

Technology Center 2100

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.

phens, Reg. No. 32,632

CDM/cm Enclosure

cc:

Edward E. Davis, Asst. Secretary (w/o encl.)

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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



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).

Customer Service Center

Initial Patent Examination Division (703) 308-1202

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APPLICATION NUMBER FILING DATE FIRST NAMED APPLICANT ATTY. DOCKET NO/TITLE 09/524,095 03/13/2000 Christine Halverson SRI1P037

I. KEITH STEPHENS CARLTON, FIELDS, WARD, EMMANUEL, SMITH & CUTLER P.O. BOX 3239 TAMPA, FL 33601-3239 *OC00000005610560*

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.

Customer Service Center Initial Patent Examination Division (703) 308-1202

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12/10/00



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Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST	IAMED INVENTOR		ATTORNEY DOCKET NO.
09/524,09!	5 03/13/00	HALVERSO	N	С	SRI1P037
			— <u>i</u>		EXAMINER
		TM02/	0424		
L. KEITH	STEPHENS			BAC	KER.F
CARLTON, F	FIELDS, WÀRD,	EMMANUEL,	SMITH &	ART UNI	T PAPER NUMBER
P.O. BOX	3239				•
TAMPA FL :	33601-3239	,		215	5
				DATE MAILE	D:
	•				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)

	, r =	Application No.	Applicant(s)
	en en en en en en en en en en en en en e	09/524,095	HALVERSON ET AL.
	Office Action Summary		
	•	Examiner	Art Unit
	The MAN INC. DATE of this	Firmin Backer	2155
Period fo	· The MAILING DATE of this communication a or Reply	appears on the cover sheet with the	correspondence address
THE I - Exter after - If the - If NO - Failu - Any r	ORTENED STATUTORY PERIOD FOR RE MAILING DATE OF THIS COMMUNICATIC risions of time may be available under the provisions of 37 CFI SIX (6) MONTHS from the mailing date of this communication period for reply specified above is less that thirty (30) days, a period for reply is specified above, the maximum statutory per to reply within the set or extended period for reply will, by steply received by the Office later than three months after the made patent term adjustment. See 37 CFR 1.704(b).	N. R 1.136 (a). In no event, however, may a reply be reply within the statutory minimum of thirty (30) or riod will apply and will expire SIX (6) MONTHS fro atute, cause the application to become ABANDO	e timely filed days will be considered timely. om the mailing date of this communication. NED (35 U.S.C. § 133).
1)🛛	Responsive to communication(s) filed on	13 March 2000 .	
2a) <u></u>	This action is FINAL . 2b)⊠	This action is non-final.	·
3)	Since this application is in condition for all closed in accordance with the practice unc		
Dispositi	on of Claims		
4)⊠	Claim(s) 56-126 is/are pending in the appl	ication.	
	4a) Of the above claim(s) is/are with	drawn 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 an	d/or election requirement.	
Applicati	on Papers		
	The specification is objected to by the Exar	miner.	
10)	The drawing(s) filed on is/are object		
11)	The proposed drawing correction filed on _		pproved.
12)	The oath or declaration is objected to by th		
	ınder 35 U.S.C. § 119		
-	Acknowledgment is made of a claim for for	eign priority under 35 LLS C & 110)(a)-(d) or (f)
,		eigh phonty under 55 0.5.6. § 116	(a)-(a) or (i).
a)[☐ All b)☐ Some * c)☐ None of:	ants have been received	
	1. Certified copies of the priority docum2. Certified copies of the priority docum		ation No
	2. Certified copies of the priority docum3. Copies of the certified copies of the priority docum		
* S	application from the International see the attached detailed Office action for a	l Bureau (PCT Rule 17.2(a)).	
14)	Acknowledgement is made of a claim for de	omestic priority under 35 U.S.C. §	119(e).
Attachment	(S)		
	ce of References Cited (PTO-892)	18) 🗍 Interview Sumr	mary (PTO-413) Paper No(s)
16) 🔲 Noti	ce of References Cited (F10-652) ce of Draftsperson's Patent Drawing Review (PTO-948 rmation Disclosure Statement(s) (PTO-1449) Paper No	3) 19) Notice of Inform	nal Patent Application (PTO-152)

Office Action Summary

U.S. Patent and Trademark Office PTO-326 (Rev. 01-01)

DISH, Exh. 1002, p. 129

Part of Paper No. 10

Art Unit: 2155

Page 1

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

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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).

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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)

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- 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).
- 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).

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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).

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Page 6

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).

- 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).

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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).

- 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).
- 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)

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- 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).

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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.

Frum Bosh Firmin Backer April 9, 2001

100	RM PTO-892 U.S. DEFARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE				SERIAL NO. 09/524,095	GROUP ART UNIT 2781	ATTACHM TO PAPER	ENT R NO.	10
		NOTICE OF R	EFERENCE	SCITED	APPLICANT(S)	1	<u> </u>		
	HALVERSON ET AL.								
				U.S. PATENT DO	CUMENTS				
*		DOCUMENT NO.	DATE	·	ME	CLASS	SUB- CLASS	FILI DA	NG TE
	Α	6,192,338	2/2001	Zasto	et al	704	257		
	В	6,173,279	1/2001	Levin	et al.	707	5		
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		Firmin Backer		April 9, 2001			Fo	rm892ccs	2106b
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CARLTON FIELDS LLP

97 SOUTH SECOND STREET SUITE 100 SAN IOSE, CALIFORNIA 95113

MAILING ADDRESS: P.O. BOX 721030, SAN JOSE, CA 95172-1030 TEL (408) 271-2300 FAX (408) 275-9579

Writer's Phone Number: (408) 271-2300

April 11, 2001

RECEIVED

APR 1 9 2001

Technology Center 2100

Washington, DC 20231

Re:

Patent Application Serial No.:

09/524,095

Inventor:

Christine Halverson, et al.

Title:

Assistant Commissioner for Patents

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.

g. No. 41,429

KJZ:ELm Enclosure

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.

SJC#112.01



HE UNITED STATES PATENT AND TRADEMARK OFFICE

RECEIVED

APR 1 9 2001

SRI1P044/44454/02740 (US4015-2)

09/398,233

Technology Center 2100

APPLICATION SERIAL NO.: 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. SRI International

ASSIGNEE:

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. SRI International

ASSIGNEE: 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



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

RECEIVED

APR 1 9 2001

Please direct all future communications and telephone calls to:

Technology Center 2100

Kevin J. Zilka CARLTON FIELDS, P.A. P.O. Box 721030 San Jose, CA 95172-1030 (408)-271-2300

SRI INTERNATIONAL

Date: 09APM 2001

Edward E. Davis, Assistant Secretary

By:



United States Patent and Trademark Office

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

FILING DATE FIRST NAMED APPLICANT APPLICATION NUMBER ATTY. DOCKET NO./TITLE 09/524,095 03/13/2000 Christine Halverson SRI1P037

CONFIRMATION NO. 6294

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).

Customer Service Center \
Initial Patent Examination Division (703) 308-1202

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United States Patent and Trademark Office

COMMISSIONER FOR PATENTS United States Patent and Trademark Office Washington, D.C. 20231

APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
00/524 005	02/12/2000	Chuistin a II alayanaan	CD 11 D027

09/524,095 03/13/2000 Christine Halverson

SRI1P037

CONFIRMATION NO. 6294

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.

Initial Patent Examination Division (703) 308-1202

OFFICE COPY

DISH, Exh. 1002, p. 145

2758

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of:

Halverson et al.

Application No. 09/524,095

Filed: 03/13/2000

For: NAVIGATING NETWORK-BASED

ELECTRONIC INFORMAITON USING

SPOKEN NATURAL LANGUAGE INPUT

WITH MULTIMODAL ERROR FEEDBACK

OGROUP

Atty

Date

WITH MULTIMODAL ERROR FEEDBACK

Group Art Unit: 2758

Atty. Docket No. SRI1P037 44454/02742

Date: Ax:\ 27, ARCEIVED

MAY*4 - 2001

Technology Center 2106

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

Signed: Evico Man

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.

1

Attny Dkt No. SRI1P037/44454/02742

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).

APR 3 0 2001

Respectfully submitted, CARLTON FIELDS

Dominic M. Kotab Reg. No. 42,762 RECEIVED

MAY 4 - 2001

Technology Center 24

P.O. Box 721030

San Jose, CA 95172-1030 Telephone: (408) 271-2300

Attny Dkt No. <u>SRI1P037/44454/02742</u>

2

Form 1449 (Modified)

Information Disclosure

Statement By Applicant:

Halverson et al.
Filing Date:

O3/13/2000

Group Art Unit:

03/13/2000

C758

<u>u 1111</u>			U.S. P	atent Documents			
Examiner		`				Sub-	Filing
Initial	No.	Patent No.	Date	Patentee	Class	class	Date
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Foreign Patent or Published Foreign Patent Application

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Examiner		Document	Publication	Country or		Sub-	Trans	slation
Initial	No.	No.	Date	Patent Office	Class	class	Yes	No
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Other Documents

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

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.

Pg. 1 of 3

PERM		
	Atty. Docket No. SRI1P037	Application No.: 09/524,095
I (W) A	Applicant: Halverson et al.	
	Filing Date: 03/13/2000	Group Art Unit:
(Use Several Sheets if Necessary)	03/13/2000	2758

U.S. Patent Documents Sub-Examiner Filing Patent No. Class Initial No. Date Patentee class Date A В C D Ε F G Η I J \overline{K}

Foreign Patent or Published Foreign Patent Application

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Other Documents

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Fib	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				
p.B	T	Moore, Robert et al., "Combining Linguistic and Statistical Knowledge Sources in Natural-Language Processing for ATIS", SRI International				
Examiner	Fu	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.

Pg. 2 of 3

P E JCTes								
Form 1449 (Modified) Information Disclosure 1813 3				Arty. Docket No.		Application No.: 09/524,095		
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Pg. 3 of 3





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**

RECEIVED

JUN 1 9 2001

Assistant Commissioner for Patents Washington, DC 20231

Technology Center 2100

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 VicDonald 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

9-26-01

Under the	Paperwork	Reduction	Act	Oi

U.S. Patent and Trademark Offic o persons are required to respond to a collection of information un i. DEPARTMENT OF COMMERCE displays a valid OMB control number.

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)

SRI 1P037

	OIPE	In re Application of HALVERSON, et al					
	1	Application Number 09/524,095	Filed March 13, 2000				
	SEP 2 1 2001 5	For Navigating Network-Based Electronic Information Using Spoken Input With Multimodal Error Feedback					
•	E COLOR	Group Art Unit Examiner 2155 F. Backer					
• •	This is a request under the provision response in the above identified ap	ns of 37 CFR 1.136(a) to extend the olication.	period for filing a				
	The requested extension and appro (check time period desired):	priate non-small-entity fee are as fol	lows				
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	☐ Three months (37 C	FR 1.17(a)(3))	\$				
	☐ Four months (37 CF	R 1.17(a)(4))	\$				
	☐ Five months (37 CF	R 1.17(a)(5))	\$ 4				
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		FR 3.73(b) is enclosed. (Form PTO	/3B/90).				
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	attorney or agent under 37 CFR 1.34(a). Registration number if acting under 37 CFR 1.34(a)						
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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.

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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DISH, Exh. 1002, p. 152

Typed or printed name

DEPARTMENT OF COMMERCE

Docket Number (Optional)

PETITION FOR EXTENSION OF T	IME UNDER 37 CF	R 1.136(a)	SRI 1P037			
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6 - 6	Application Number	09/524,095 F	iled March 13	, 2000		
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A check in the amount of the Payment by credit card. For The Commissioner has alread application to a Deposit Accommunity The Commissioner is hereby or credit any overpayment, I have enclosed a duplicate I am the applicant/inventor. assignee of record of the Statement under 37 Classing attorney or agent of record attorney or agent under Registration number if active in the Registration number in the Registration number if active in the Registration number in the Registration number in the Registration number in the Registration number in the Registration number in the Registration number in the Registration number in the Registration number in the Registration number in the Registration number in the Registration number in the Registration number in the Registration number in the Registration number in the Regist	m PTO-2038 is attached been authorized to count. y authorized to charge to Deposit Account No copy of this sheet. e entire interest. See FR 3.73(b) is enclosed and.	o charge fees in this any fees which ma umber <u>20-0782</u> 37 CFR 3.71 1. (Form PTO/SB/9	by be required,	SEP 2.5 2001 Technology Center 2100		
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•		KIN-VVAH	TONG, Reg. N	10. 39,4UU		

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*.

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.



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

SRI/4116-3



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.

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

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 <u>SRI International</u>, a California non-profit corporation having a place of business at 333 Ravenswood Avenue, <u>Menlo Park</u>, 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: Typed Name:	Christine Halverson	Date:	6-16-00.
2)	Signature: Typed Name:	Luc Julia	Date:	
3)	Signature: Typed Name:	Dimitris Voutsas	Date:	6/16/00
4)	Signature: Typed Name:	Adam Cheyer Chay	Date:	6/22/00

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

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

1)	Signature: Typed Name:	Christine Halverson	Date:	6-16-00.
2)	Signature: Typed Name:	Luc Julia	Date:	6.20.00
3)	Signature: Typed Name:	Dimitris Voutsas	Date:	6/16/00
4)	Signature: Typed Name:	Adam Cheyer	Date:	

Attny Docket No. SRI1P037

ASSIGNMENT OF PATENT APPLICATION

(Not Accompanying Application)

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

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- 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).

..... Da-I--+ NTA CDT1D027

1)	Signature: Typed Name:	Christine Halverson	Date:	6-16-00.
2)	Signature: Typed Name:	Luc Julia	Date:	
3)	Signature: Typed Name:	Diraitris Voutsas	Date:	6/16/00
4)	Signature: Typed Name:	Adam Cheyer	Date:	
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DISH, Exh. 1002, p. 158

PTO/SB/21 (08-00)

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Approved for use tf.:bugh 10/31/2002. OMB 0651-0031

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

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TPE -		Application Number	09/524,095
TRANSMITTAL	-	Filing Date	March 13, 2000
FORM		First Named Inventor	HALVERSON
(to be used by all correspondence after l	nitial filing)	Group Art Unit	2155
N CAR		Examiner Name	F. BACKER
This Number of Pages in This Submission	1	Attorney Docket Number	SRI 1 P 037
	ENCL	OSURES (check all that apply)	
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Firm or Individual name KIN-WAH TONG			
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I hereby certify that this correspondence is	being depos	ited with the United States Posta	al Service as first class mail in an envelope
addressed to: Assistant Commissioner fo	r Patents, Wa	shington, D.C. 20231 on this dat	e: September 19, 2001
Typed or printed name Linda DeNard	li		
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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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SUBMITTED BY				Con	nplete (if applicable)
Name (Print/Type)	KIN-WAH TONG	Registration No. Attorney/Agent)	39,400	Telephone	(732) 530-9404
Signature	2	9/2/4		Date	SEPTEMBER 19, 2001

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United States Patent and Trademark Office

COMMISSIONER FOR PATENTS STATES PATENT AND TRADEMARK OFFICE WASHINGTON, D.C. 20231

APPLICATION NUMBER FILING DATE FIRST NAMED APPLICANT ATTY. DOCKET NO./TITLE

09/524,095 03/13/2000 Christine Halverson SRI1P037

CONFIRMATION NO. 6294

OC0000006797094

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 D JOHNSON 2100 7033085229

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UNITED STATES PATENT AND TRADEMARK OFFICE

Washington, D.C. 2023

APPLICATION NUMBER FILING DATE FIRST NAMED APPLICANT ATTY. DOCKET NO/TITLE

09/524,095 03/13/2000 Christine Halverson SRI1P037

* OC00000006797149*

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 D JOHNSON 2100 7033085229

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION

Filed: March 13, 2000

Applicant: Halverson et al.

Case: SRI1P037

Serial No.: **09/524,095**

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

SIR:

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.

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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
 - (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,

Kin-Wah Tong, Attorney

Reg. No. 39,400 (732) 530-9404

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

9/19/01

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Approved for use through 10/31/2002. OMB 0651-0031/

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SUBMITTED BY				C	omplete (if applicable)
Name (Print/Type)	KIN-WAH TONG	Registration No. Attorney/Agent)	39,400	Telephone	(732) 530-9404
Signature	6	1/9/1/		Date	SEPTEMBER 19, 2001

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SRJ/4116-3

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

#19 LW

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

Assistant Commissioner for Patents Office of Initial Patent Examination **Customer Service Center** Washington, D. C. 20231

OCT 0 5 2001 **Technology Center 2100**

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, Attorsey

Reg. No. 39,400

Moser, Patterson & Sheridan, LLP 595 Shrewsbury Avenue - Suite 100 Shrewsbury, New Jersey 07702 (732)530-9404



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Hickman Stephens Coleman & Hughes LLP PO Box 52037 Palo Alto, CA 94303-0746 FILING RECEIPT

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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;

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 Filling License Granted 05/12/2000

" SMALL ENTITY "

Title

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Navigating network-based electronic information using spoken natural language input with multimodal error feedback

Preliminary Class

709

9/8/00

SRI/4116-3

CERTIFICATE OF FACSIMILE TRANSMISSION

<u>Under 37 C.F.R.§ 1.8(a)</u>

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
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Linda De nardi
Signature





UNITED STATES DEPARTMENT OF COMMERCE

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Washington, D.C. 20231

FIRST NAMED INVENTOR APPLICATION NO. FILING DATE ATTORNEY DOCKET NO. 09/524,095 03/13/00 HALVERSON SRI1P037 **EXAMINER** TM02/1010 THOMASON, MOSER & PATTERSON, LLP BACKER ART UNIT PAPER NUMBER 595 SHREWSBURY AVENUE SUITE 100 SHREWSBURY NJ 07702 2155 DATE MAILED:

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

Commissioner of Patents and Trademarks

10/10/01

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

1- File Copy

	Application No.	Applicant(s)
	09/524,095	HALVERSON ET AL.
Office Action Summary	Examiner	Art Unit
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The MAILING DATE of this communicat Period for Reply	ion appears on the cover sheet with	h the correspondence address
A SHORTENED STATUTORY PERIOD FOR THE MAILING DATE OF THIS COMMUNICA - Extensions of time may be available under the provisions of after SIX (6) MONTHS from the mailing date of this communi - If the period for reply specified above is less than thirty (30) of - If NO period for reply is specified above, the maximum statute - Failure to reply within the set or extended period for reply with - Any reply received by the Office later than three months after earned patent term adjustment. See 37 CFR 1.704(b). Status	ATION. 37 CFR 1.136 (a). In no event, however, may a recation. lays, a reply within the statutory minimum of thirt ory period will apply and will expire SIX (6) MON, by statute, cause the application to become AB	reply be timely filed by (30) days will be considered timely. ITHS from the mailing date of this communication. BANDONED (35 U.S.C. § 133).
1) Responsive to communication(s) filed	on <u>21 September 2001</u> .	
2a)⊠ This action is FINAL . 2b)☐ This action is non-final.	
3) Since this application is in condition for closed in accordance with the practice		
isposition 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) <u>56-126</u> is/are rejected.		
7) Claim(s) is/are objected to.		
8) Claims are subject to restriction	n and/or election requirement.	
pplication Papers		
9) The specification is objected to by the	Examiner.	
10) The drawing(s) filed on is/are of	pjected to by the Examiner.	
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12) The oath or declaration is objected to be	by the Examiner.	
riority under 35 U.S.C. § 119		
13) Acknowledgment is made of a claim fo	r 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 do	cuments have been received.	
2. Certified copies of the priority do	cuments have been received in A	pplication No
 Copies of the certified copies of application from the Internati See the attached detailed Office action f 	onal Bureau (PCT Rule 17.2(a)).	
14) Acknowledgement is made of a claim f	or domestic priority under 35 U.S.	C. § 119(e).
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5) Notice of References Cited (PTO-892) 6) Notice of Draftsperson's Patent Drawing Review (PTO-7) Information Disclosure Statement(s) (PTO-1449) Pap	O-948) 19) 🔲 Notice of	Summary (PTO-413) Paper No(s) Informal Patent Application (PTO-152)
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DISH, Exh. 1002, p. 174

Art Unit: 2155

Page 1

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

Art Unit: 2155

Page 2

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).
- 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)
- 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).

Art Unit: 2155

- 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)

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- 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).

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- 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).

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- 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).
- 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).

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- 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).
- 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).
- 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).
- 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)

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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).

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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?").

user in order to generate user's request.

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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

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.

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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

SUPERVISORY PATENT EXAMINES
TECHNOLOGY CENTER 2100



United States I

INT AND TRADEMARK OFFICE

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.	CONFIRMATION NO.
09/524,095	03/13/2000	Christine Halverson	SRI1P037	6294
25696	7590 01/15/2002			•
OPPENHEIMER WOLFF & DONNELLY			EXAMINER	
P. O. BOX 10 PALO ALTO			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)

	Application No.	Applicant(s)				
Interview Summary	09/524,095	HALVERSON I	ET AL.			
interview Summary	Examiner	Art Unit				
	Firmin Backer	2155				
All participants (applicant, applicant's representative,	PTO personnel):					
(1) Firmin Backer (examiner).	(3) <u>Kin-Wah Ton</u> g	g (Attorney).				
(2) Ario Etienne (primary examiner).	(4)					
Date of Interview: 08 January 2002.						
Type: a)⊠ Telephonic b)⊡ Video Conferenc c)⊡ Personal [copy given to: 1)⊡ applica	e ant 2)⊡ applicant's repr	resentative]	•			
Exhibit shown or demonstration conducted: d) Y	es e)⊡ No.					
Claim(s) discussed: <u>56</u> .	-	. 4,				
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 generated, or any other comments: Applicant argues to should be withdrawn. Applicant argues that the priorespecially the concept of transmitting the selected position device of the user. (A fuller description, if necessary, and a copy of the allowable, if available, must be attached. Also, where allowable is available, a summary thereof must be at	hat the statutory double pa art fails to teach all the lim- ortion of the electronic data amendments which the exa e no copy of the amendme	atenting rejection is impro itations of the inventive of a source from the network aminer agreed would ren	oper and concept (concept to a der the claims			
i) It is not necessary for applicant to provid checked).		substance of the intervie	ew(if box is			
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION

Applicant: Haiverson 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

SIR:

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.

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;
- (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)

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 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 <u>user interaction that is in a different modality than the original request, e.g., a natural language request that originally started the navigation request.</u> 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 <u>additional queries</u> 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 <u>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</u>

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 <u>not</u> require the user to provide the additional inputs in a <u>different modality than the original request</u> 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 <u>Mr. Kin-Wah Tong, Esq.</u> at

(732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

1/10/02

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

Respectfully submitted,

Kin-Wah Tong, Attorney Reg. No. 39,400

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TELEFAX COVER SHEET

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********************* THIS MESSAGE HAS 9 PAGES INCLUDING THIS SHEET Assistant Commissioner of Patents FAX NO.: 703-746-7238 FROM: Kin-Wah Tong January 10, 2002 DATE: __ 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: X Transmittal Letter (2 copies) Petition Disclosure Statement & PTO-1449 Fee Transmittal (2 copies) Priority Document Deposit Account Transaction Drawings (____ sheets) informal X Facsimile Transmission Certificate X Response Under 37 CFR 1.116 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

Received from < 732 530 9808 > at 1/10/02 4:00:32 PM [Eastern Standard Time]

		Applic	ation Number	09/524,095
TRANSMITTAL		Filing	Date	March 13, 2000
FORM		First N	lamed Inventor	HALVERSON
(to be used for all correspondence after in	tial filing)	Group	Art Unit	2155
		Exami	ner Name	F. BACKER
otal Number of Pages In This Submission	9	Attorn	y Docket Number	SRI 1 P 037
	ENCL	OSURES	(check all that apply)	
Fee Transmittal Form		ment Par Application		After Allowance Communication to Group
Fee Attached	Drawin	g(s)		Appeal Communication to Board of Appeals and Interferences
Amendment / Response	Licens	ing-relate	d Papers	Appeal Communication to Group (Appeal Notice, Brief, Reply Brief)
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	1.	Applic	ation Number	09/524,095
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FORM		First N	lamed Inventor	HALVERSON
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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			
OPPENHEII	MER WOLFF & DONNE	ELLY	EXAM	NER
P. O. BOX 10 PALO ALTO	:		BACKER,	FIRMIN
	•		ART UNIT	PAPER NUMBER
		•	2155	23
	•	•	DATE MAILED: 02/19/2002	

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PTO-90C (Rev. 07-01)

	Application No.	Applicant(s)
A shiisa wa A a Aisa w	09/524,095	HALVERSON ET AL.
Advisory Action	Examiner	Art Unit
	Firmin Backer	2155
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THE REPLY FILED 07 January 2002 FAILS TO PLACE Therefore, further action by the applicant is required to final rejection under 37 CFR 1.113 may only be either: condition for allowance; (2) a timely filed Notice of App Examination (RCE) in compliance with 37 CFR 1.114.	o avoid abandonment of this a c (1) a timely filed amendment peal (with appeal fee); or (3) a	pplication. A proper reply to a which places the application in
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a) The period for reply expires 3 months from the mailing date b) The period for reply expires on: (1) the mailing date of this A event, however, will the statutory period for reply expire later ONLY CHECK THIS BOX WHEN THE FIRST REPLY WA 706.07(f). Extensions of time may be obtained under 37 CFR 1.136(a). The have been filed is the date for purposes of determining the period of ext 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shorter (b) above, if checked. Any reply received by the Office later than three	Advisory Action, or (2) the date set forther than SIX MONTHS from the mailing of AS FILED WITHIN TWO MONTHS Of date on which the petition under 37 CF tension and the corresponding amount ned statutory period for reply originally set.	late of the final rejection. F THE FINAL REJECTION. See MPEP FR 1.136(a) and the appropriate extension fee of the fee. The appropriate extension fee under set in the final Office action; or (2) as set forth in
earned patent term adjustment. See 37 CFR 1.704(b). 1. A Notice of Appeal was filed on Appellar 37 CFR 1.192(a), or any extension thereof (37 CFR 1.192(a)).		
2. The proposed amendment(s) will not be entered	because:	
(a) They raise new issues that would require fur	ther consideration and/or sea	rch (see NOTE below);
(b) they raise the issue of new matter (see Note	e below);	
(c) they are not deemed to place the applicationissues for appeal; and/or	n in better form for appeal by	materially reducing or simplifying the
(d) they present additional claims without cand NOTE:	celing a corresponding numbe	r of finally rejected claims.
3. Applicant's reply has overcome the following reje	ection(s):	
4. Newly proposed or amended claim(s) wou canceling the non-allowable claim(s).	uld be allowable if submitted in	n a separate, timely filed amendment
5.⊠ The a) affidavit, b) exhibit, or c) request application in condition for allowance because:		considered but does NOT place the
6. The affidavit or exhibit will NOT be considered to raised by the Examiner in the final rejection.	pecause it is not directed SOL	ELY to issues which were newly
7. For purposes of Appeal, the proposed amendme explanation of how the new or amended claims		
The status of the claim(s) is (or will be) as follow	vs:	
Claim(s) allowed:		/
Claim(s) objected to:		
Claim(s) rejected: 51-12.6		
Claim(s) withdrawn from consideration:		·
8. The proposed drawing correction filed on	is a) ☐ approved or b) ☐ di	sapproved by the Examiner.
9. Note the attached Information Disclosure Staten	nent(s)(PTO-1449) Paper No	(s)
10. Other:		
PTO-303 (Rev. 04-01)	dvisory Action	Part of Paper No. 10

Continuation Sheet (PTO-303) 09/524,095

Application No.

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 sinige answer then the service host might the list the possibilities 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



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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/524,095	03/13/2000	Christine Halverson	SRI1P037	6294
7	590 04/03/2002			
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SHREWSBUR	Y, NJ 07702	•	1 n a 1 n a m	
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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

Firmin Backer 2155	The MAILING DATE of this communication appears on the cover sheet with the correspondence address — LY FILED 07 January 2002. FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE, further action by the applicant is required to avoid abandonment of this application. A proper reply to a fron under 37 CFR 1.1 furging might be added to the policy of the policy of the policy of the policy of the policy of the policy of the policy of the policy of the policy of the policy of the policy of the policy of the policy of the policy of the policy of the policy of the period for reply expires 2 months from the mailing date of the final rejection. The period for reply expires 0.1 (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no vertical policy of the period for reply expires 2 months from the mailing date of the final rejection, whichever is later. In no vertical policy of the policy of the period for reply expires 2 months from the mailing date of the final rejection, whichever is later. In no vertical policy of the policy o	PTO-303	(Rev. 04-01) Adv	isory Action	Part of Paper No. 10
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Firmin Backer -The MAILING DATE of this communication appears on the cover sheet with the corresponder. THE REPLY FILED 07 January 2002 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR Therefore, further action by the applicant is required to avoid abandonment of this application. A prinal rejection under 37 CFR 1.113 may only be either: (1) a timely filed amendment which places the condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Rec 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 3 months from the mailing date of the final rejection. b) The period for reply expires 3 months from the mailing date of the final rejection. b) The period for reply expires 3 months from the mailing date of the final rejection. cent, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection ovent, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection ovent, however, will the statutory period for reply expires of time may be obtained under 37 CFR 1.136(a). The date on which the petition months 7 CFR 1.136(a) and the inaversal been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appr 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 (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if the earned patent term adjustment. See 37 CFR 1.704(b). 1	Advisory Action Page 24,095	3.□	Applicant's reply has overcome the following reject	ction(s):	
Firmin Backer -The MAILING DATE of this communication appears on the cover sheet with the corresponder. THE REPLY FILED 07 January 2002 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR Therefore, further action by the applicant is required to avoid abandonment of this application. A prinal rejection under 37 CFR 1.113 may only be either: (1) a timely filed amendment which places the condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Rec Examination (RCE) in compliance with 37 CFR 1.114. PERIOD FOR REPLY [check either a) or b)] a) The period for reply expires on: (1) 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 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 REJETIVE. 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 inhave been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The apprince of the shortened statutory period for reply originally set in the final office (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if the 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 for 37 CFR 1.192(a), or any extension thereof (37 CFR 1.191(d)), to avoid dismissal of the appear and the proposed amendment(s) will not be entered because: (a) they raise new issues that would require further consideration and/or search (see NOTE In they are not deemed to place the application in better form for appeal by materially reducing several proposed.	Advisory Action Examiner			ang a corresponding number of	many rejected dams.
Firmin Backer -The MAILING DATE of this communication appears on the cover sheet with the corresponder. THE REPLY FILED 07 January 2002 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR Therefore, further action by the applicant is required to avoid abandonment of this application. A prinal rejection under 37 CFR 1.113 may only be either: (1) a timely filed amendment which places the condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Rec Examination (RCE) in compliance with 37 CFR 1.114. PERIOD FOR REPLY [check either a) or b)] a) The period for reply expires on: (1) 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 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 (7). 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 chave been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The apprince of the shortened statutory period for reply originally set in the final Office (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if the 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 for 37 CFR 1.192(a), or any extension thereof (37 CFR 1.191(d)), to avoid dismissal of the appear (b) they arise new issues that would require further consideration and/or search (see NOTE I) they are not deemed to place the application in better form for appeal by materially reduced.	Advisory Action Examiner	(d		ling a corresponding number of	finally rejected claims
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Firmin Backer The MAILING DATE of this communication appears on the cover sheet with the corresponder. THE REPLY FILED 07 January 2002 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR Therefore, further action by the applicant is required to avoid abandonment of this application. A prinal rejection under 37 CFR 1.113 may only be either: (1) a timely filed amendment which places the condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Rec 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 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 REJETOR.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 allowed been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appril 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 (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if the 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 for 37 CFR 1.192(a), or any extension thereof (37 CFR 1.191(d)), to avoid dismissal of the appear.	Advisory Action Examiner	1	· ·		X //
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Firmin Backer The MAILING DATE of this communication appears on the cover sheet with the corresponder THE REPLY FILED 07 January 2002 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR Therefore, further action by the applicant is required to avoid abandonment of this application. A prefinal rejection under 37 CFR 1.113 may only be either: (1) a timely filed amendment which places the condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Recondition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Recondition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Recondition for allowance; (3) a timely filed Recondition for allowance; (4) a timely filed Notice of Appeal (with appeal fee); or (5) a timely filed Recondition for allowance; (5) a timely filed Recondition for allowance; (6) a timely filed Notice of Appeal (with appeal fee); or (6) a timely filed Recondition for allowance; (6) a timely filed Recondition for allowance; (7) a timely filed Recondition for allowance; (8) a timely filed Recondition for allowance; (8) a timely filed Recondition for allowance; (8) a timely filed Recondition for allowance; (8) a timely filed Recondition for allowance; (8) a timely filed Recondition for allowance; (8) a timely filed Recondition for allowance; (8) a timely filed Recondition for allowance; (8) a timely filed Recondition for allowance; (8) a timely filed Recondition for allowance; (8) a timely filed Recondition for allowance; (8) a timely filed Recondition for allowance; (8) a timely filed Recondition for allowance; (8) a timely filed Recondition for allowance; (8) a timely filed Recondition for allowance; (8) a timely filed Recondition for allowance; (8) a timely filed Recondition for allowance; (8) a timely filed Recondition for allowance; (8) a timely filed Recondition for allowance; (8) a timely filed Recondition for all timely filed Recondition for allowance; (8) a timely filed R	Advisory Action O9/524,095		PERIOD FOR RE	EPLY [check either a) or b)]	•
Firmin Backer 2155	Advisory Action O9/524,095 HALVERSON ET AL. Examiner Firmin Backer 2155	There final i	efore, further action by the applicant is required to a rejection under 37 CFR 1.113 may <u>only</u> be either: (ition for allowance: (2) a timely filed Notice of Appe	avoid abandonment of this appli 1) a timely filed amendment whi	cation. A proper reply to a ich places the application in
Firmin Backer 2155	Advisory Action O9/524,095 HALVERSON ET AL. Examiner Firmin Backer 2155	}	The MAILING DATE of this communication appe	ears on the cover sheet with the d	correspondence address
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1 00/504 005 LALVEDOC	C. Officer TAI Application No. Applicant(s)			09/524,095	HALVERSON ET AL.
Se 001 TAL Application No. Applicant(Se Offeren Tal.	Application No.	Applicant(s)

Continuation Sheet (PTO-303) 09/524,095

Application No.

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 sinige answer then the service host might the list the possibilities 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.

PTO/SB/22 (10-00) ough 10/31/2002. OMB 0651-0031 S. DEPARTMENT OF COMMERCE

is it displays a valid OMB control number Docket Number (Optional) PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a) **SRI 1P037** 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** 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 RECEIVED application to a Deposit Account. The Commissioner is hereby authorized to charge any fees which may be required, APR 1 2 2002 or credit any overpayment, to Deposit Account Number 20-0782. I have enclosed a duplicate copy of this sheet. Technology Center 2100 I am the \square 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 LJ0HHQDN 00WARNING: Information on this form may become public. Credit card information should not 260, be included on this form. Provide credit card information and authorization on PTO-2038. April 10, 2002 Date Signature **KIN-WAH TONG** 14/12/2002 AWDNDAF1 00000141 200782 09524095 Typed or printed name 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 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.

forms if more than one signature is required, see below*.

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Under the Pap

PTO/SB/30 (8/2000) Approved for use through 10/31/2002 OMB 0651-0031 U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

95, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

RADEMAR 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 petent 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. St	ubmiss	sion requ	ired under 37 C.F.R. § 1.114.	
a. 🗆	Pre	viously s	ubmitted	\$
i.		Consider on	the amendment(s)/reply under 37 C.F.R. § 1.116 previously filed	RECEIVED
	. 🗆	Consid Other	der the arguments in the Appeal Brief or Reply Brief previously filed on	APR 1 2 2002
b. 🛛	Encl	losed		
	. 🗖	Affidav	rit(s)/Declaration(s)	Technology Center 210
iii	_		ation Disclosure Statement (IDS)	
	<u>. X</u>	Other	Preliminary Amendment	1
		aneous		
a. L		•	of action on the above-identified application is requested under 37 C.F.	* '
b. [3. F	Oth	er	months (Period of suspension shall not exceed 3 months; Fee under 37 C.F.R.§ 1. fee under 37 C.F.R.§ 1.17(e) is required by 37 C.F.R.§ 1.114 when the RCE is filed.	17(i) required)
	☑ The	Director	is hereby authorized to charge the following fees, or credit any overparount No	yments, to
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Nan	10 (Prin	t / Type)	KIN-WAH TONG Registration No. (Attorney / Agent)	39,400
	Signatu	ıre	Date April 10, 2002	

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PTO/SB/30 (8/2000)

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Attorney Docket Number

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Application Number	09/524,095
Filing Date	March 13, 2000
First Named Inventor	HALVERSON
Group Art Unit	2155
Eveminer Name	F Backer

SRI 1P037

Sousection (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).

REQUEST
FOR

CONTINUED EXAMINATION (RCE)
TRANSMITTAL

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 petent 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. Gez. Pat. Office 47 (Apr. 11, 2000), which established RCE Practice.

1 Submission requi	red under 37 C.F.R. § 1.114.			¥
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Name (Print / Type)	KIN-WAH TONG	Registr	ation No., (Attorney / Agent)	39,400
Signature	2 2/2/2	Date	April 10, 2002	

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09/524,095



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PATENT APPLICATION

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APR 1 2 2002

Technology Center 2100

Case: SRI1P037

Filed: March 13, 2000

Serial No.: 09/524,095

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

SIR:

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



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

Respectfully submitted,

Kin-Wah Tong, Attorney Reg. No. 39,400

(732) 530-9404

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PATENT APPLICATION

Filed: March 13, 2000

Applicant: Halverson et al.

Case: SRI1P037

Serial No.: 09/524,095

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APR 1 2 2002

Technology Center 2100

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Respectfully submitted,

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

09/524,095



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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APR 1 2 2002

Technology Center 2100

PATENT APPLICATION

Filed: March 13, 2000

Applicant: Halverson et al.

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FEEDBACK

ASSISTANT COMMISSIONER FOR PATENTS

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Washington, D. C. 20231

SIR:

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:

1

- (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 nonspoken modality different than the original request;
 - (e) refining the navigation query, based upon the additional input;
- (f) using the refined mavigation 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.
- 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;
- (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 speechbased 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) <u>soliciting additional input from the user, including user interaction in a non-spoken modality different than the original request;</u>
 - (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;
- (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. (emphasis added)

Applicants direct the Examiner's attention to the fact that 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 non-spoken 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 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 <u>additional</u> <u>queries</u> 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 <u>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</u>

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 <u>not</u> 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,

Kin-Wah Tong, Attorney

Reg. No. 39,400 (732) 530-9404

Moser, Patterson & Sheridan, LLP 595 Shrewsbury Avenue

4/10/02

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;
- (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.
- 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;
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- (d) user interaction logic, operable to solicit additional input from the user, including user interaction in a <u>non-spoken</u> 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 <u>non-spoken</u> 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.

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Name	147	2,520	147	2,520	For filing a request for reexamination	
Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17	112	920*	112	920*	Requesting publication of SIR prior to Examiner action	
Applicant claims small entity status. See 37 CFR 1.27	113	1,840*	113	1,840*	Requesting publication of SIR after Examiner action	
Payment Enclosed:	115	110	215	55	Extension for reply within first month	
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FEE CALCULATION	117	920	217	460	Extension for reply within third month	200.00
BASIC FILING FEE	118	1,440	218	720	Extension for reply within fourth month	
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e Fee Fee Fee Description	119	320	219	160	Notice of Appeal	
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1 740 201 370 Utility filing fee	121	280	221	140	Request for oral hearing	
6 330 206 165 Design filing fee 7 510 207 255 Plant filing fee	138	1,510	138	1,510	Petition to institute a public use	
8 740 208 370 Reissue filing fee	140	110	240	55	Petition to revive - unavoidable	
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	142	1,280	242	640	Utility issue fee (or reissue)	
SUBTOTAL (1) (\$) 0	143	460	243	230	Design issue fee	
EXTRA CLAIM FEES	144	620	244	310	Plant issue fee	
Extra Fee from Fee	122	130	122	130	Petitions to the Commissioner	
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e Fee Fee Fee Description de (\$) Code (\$)	149	740	249	370	For each additional invention to be examined (37 CFR § 1.129(b))	
18 203 9 Claims in excess of 20 2 84 202 42 Independent claims in excess of 3	179	740	279	370	Request for Continued Examination (RCE)	370.00
2 84 202 42 Independent claims in excess of 3 4 280 204 146 Multiple dependent claim, if not paid	169	900	169	900	Request for expedited examination	<u> </u>
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SUBMITTED BY				Co	omplete (if applicable)	
Name (Print/Type)	KIN-WAH TONG	Registration No. Attorney/Agent)	39,400	Telephone	(732)530-9404	
Signature	1	9/1		Date	APRIL 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	
	7590 05/07/2002				
THOMASON, MOSER & PATTERSON, LLP			EXAMINER		
SUITE 100	BURY AVENUE		BACKER,	FIRMIN	
SHREWSBUR	RY, NJ 07702		ART UNIT	PAPER NUMBER	
		· .	3621	<i>(</i>	
	•		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)

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		Application No.	Applicant(s)
	Office Anti Comment	09/524,095	HALVERSON ET AL.
	Office Action Summary	Examiner	Art Unit
		Firmin Backer	3621
	The MAILING DATE of this communication	n appears on the cover sheet with	the correspondence address
THE N - Exten after S - If the - If NO - Failur - Any re	DRTENED STATUTORY PERIOD FOR F MAILING DATE OF THIS COMMUNICAT sions of time may be available under the provisions of 37 C SIX (6) MONTHS from the mailing date of this communicati period for reply specified above is less than thirty (30) days period for reply is specified above, the maximum statutory e to reply within the set or extended period for reply will, by sply received by the Office later than three months after the d patent term adjustment. See 37 CFR 1.704(b).	ION. FR 1.136 (a). In no event, however, may a reion. In a reply within the statutory minimum of thirty period will apply and will expire SIX (6) MONT statute, cause the application to become AB/	eply be timely filed (30) days will be considered timely. THS from the mailing date of this communication. ANDONED (35 U.S.C. § 133).
1)🛛	Responsive to communication(s) filed or	n <i>10 April 2002</i>	
2a) [This action is non-final.	
3)	Since this application is in condition for a closed in accordance with the practice u	- allowance except for formal mat	
Dispositi	on of Claims		
4)⊠	Claim(s) 56-126 is/are pending in the ap	plication.	
	4a) Of the above claim(s) is/are wit	thdrawn from consideration.	
5)	Claim(s) is/are allowed.		
6)⊠	Claim(s) <u>56-126</u> is/are rejected.		
•	Claim(s) is/are objected to.		
· · ·	Claims are subject to restriction a	and/or election requirement.	
Apolicatio	on Papers		
	The specification is objected to by the Ex	aminer.	:
	The drawing(s) filed on is/are obje		
	The proposed drawing correction filed on		disapproved.
12)	The oath or declaration is objected to by	the Examiner.	· · · · · · · · · · · · · · · · · · ·
Priority u	nder 35 U.S.C. § 119		
-	Acknowledgment is made of a claim for fo	oreign priority under 35 U.S.C. &	119(a)-(d) or (f).
•	All b) Some * c) None of:		
•	1. Certified copies of the priority docu	iments have been received.	
	2. Certified copies of the priority docu		oplication No
	3. Copies of the certified copies of the application from the Internation ee the attached detailed Office action for	e priority documents have been all Bureau (PCT Rule 17.2(a)).	received in this National Stage
14)	Acknowledgement is made of a claim for	domestic priority under 35 U.S.	C. § 119(e).
\ffgahman4	(e)		
	(s) se of References Cited (PTO-892) se of Draftsperson's Patent Drawing Review (PTO-9		Summary (PTO-413) Paper No(s) Informal Patent Application (PTO-152)

Application/Control Number: 09/524,095

Art Unit: 3621

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

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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).

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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)

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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).

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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)
- 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

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(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

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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).

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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

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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).

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Art Unit: 3621

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).

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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

PATENT

JUN 2 5 **2002**

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

Certificate of Mailing

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

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JUL 0 1 2002

Technology Center 2100

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:

Respectfully submitted,

PERKINS COIE LLP

Paul L. Hickman Reg. No. 28,516

101 Jefferson Drive Menlo Park, CA 94025

Telephone: (650) 838-4443 Facsimile: (650) 838-4350

Attorney Docket No. SRI1P037 USA



and Trademark Office
COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

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			ART UNIT PAPER NUMBER
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		DATE M	AILED:
		EXAMINER INTERVIEW SUMMARY RECORD	
All participants (applican	t, applicant's represent	tative, PTO personnel):	
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(a) Knuah	Fora	39,400	
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Date of interview			
Type: 🗆 Telephonic (Personal (copy is g	lven to 🛘 applicant 🗘 applicant's representative).	
Exhibit shown or demons	tration conducted:	Yes LYNo. If yes, brief description:	
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Agreement was read	shed with respect to so $56 - 126$	ome or all of the claims in question.	
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Claims discussed:	discussed: FOLD al nature of what was a composite of the amendment of the substantial may be present in the ments of the last Office.	agreed to if an agreement was reached, or any other comments: Ward element (d) and class Ward to with draw the June of the amendments, if available, which the examiner agreed would ents which would render the claims allowable is available, a sumitide a separate record of the substance of the interview. It to indicate to the contrary, A FORMAL WRITTEN RESPONSE TO NCE OF THE INTERVIEW (e.g., items 1-7 on the reverse side of given one month from this interview date to provide a statement ary above (including any attachments) reflects a complete response least Office action, and since the claims are now allowable, this	The applicant In 56, and Irender the claims allowable must be many thereof must be attached.) TO THE LAST OFFICE ACTION IS NOT if this form). If a response to the last Office of the substance of the interview. The applicant is the objections, rejections and completed form is considered to fulfill the

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09/524.095 **RECEIVED**

IN THE UNITED STATES

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

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

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 nonspoken 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.
- (Amended) The method of claim 56, wherein the step of rendering an interpretation further includes deriving linguistic information by using a speech recognition engine and a linguistic parser.
- (Amended) The method of claim 58, 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.
- (Amended) The method of claim 56, wherein the step of extracting the input template includes dynamically scraping the online scripted interface.
- 6. (Amended) The method of claim 56, wherein the navigation query is constructed in the format of a database query language.

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- (Amended) The method of claim 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.
- (Amended) The method of claim 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.
- (Amended) The method of claim 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.
- (Amended) The method of claim 63, wherein the deficiencies include unresolved words of the spoken request.
- 65. (Amended) The method of claim 33, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken request.
- 66. (Amended) The method of claim 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).
- (Amended) The method of claim 66, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.
- 6. (Amended) The method of claim 6. wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

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69. (Amended) The method of claim 56, wherein the additional input is solicited upon receiving a user-input statement that additional information is required.

70. (Amended) The method of claim 56, wherein the step of soliciting the additional input includes presenting a menu to the user on the client device of the user.

(Amended) The method of claim 56, wherein the step of soliciting the additional input includes presenting a textual request for the additional input.

72. (Amended) The method of claim 56, wherein the step of soliciting the additional input includes an audible request for the additional input.

73. (Amended) The method of claim 5%, 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. (Amended) The method of claim 56, wherein additional input received from the user is at least partially speech based.

10 () (75. (Amended) The method of claim 56, wherein additional input received from the user includes no spoken input.

26. (Amended) The method of claim 56, wherein steps (d)-(e) are repeated until the navigational query is deemed adequate.

(Amended) The method of claim 56, wherein the input modality of step (d) includes selecting from a displayed option menu.

78. (Amended) The method of claim 71, wherein the act of selecting from the displayed

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option menu is performed by speaking.

(Amended) The method of claim 56, wherein the method is performed with respect to a plurality of simultaneous users and corresponding client devices.

80. (Amended) The method of claim 5%, 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. (Amended) The method of claim 56, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

2. (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.

23. (Amended) The system of claim 32, wherein the language processing logic includes speech recognition logic and an linguistic parsing logic for deriving linguistic information.

84. (Amended) The system of claim 22, 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. (Amended) The system of claim 84, wherein the language processing logic dynamically scrapes the online scripted interface.

%\ (Amended) The system of claim & wherein the query construction logic constructs the query in the format of a database query language.

27. (Amended) The system of claim 22, 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.

(Amended) The system of claim 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.

29. (Amended) The system of claim 32, 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. (Amended) The system of claim 80, wherein the deficiencies include unresolved words of the spoken request.

(Amended) The system of claim 39, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken request.

92. (Amended) The system of claim 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.

31 (Amended) The system of claim 92, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

34. (Amended) The system of claim 92, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

95. (Amended) The system of claim 82, wherein the user interaction logic displays an option menu.

96. (Amended) The system of claim 98, wherein the act of selecting from the displayed option menu is performed by speaking.

97. (Amended) The system of claim \$2, 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.

(Amended) The system of claim 82, wherein the electronic data source stores

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multimedia content including at least one of video content and audio content.

99. (Amended) The system of claim 22, wherein the display device receives data from the electronic data source on the network servers via a communications box.

100. (Amended) The system of claim 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-ontic}.

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.

102. (Amended) The computer program of claim 101, further comprising a code

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segment that derives linguistic information by using a speech recognition engine and a linguistic parser.

(Amended) The computer program of claim 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.

104. (Amended) The computer program of claim 103, further comprising a code segment that dynamically scrapes the online scripted interface.

195. (Amended) The computer program of claim 191, wherein the navigation query is constructed in the format of a database query language.

106. (Amended) The computer program of claim 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.

(Amended) The compute program of claim 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.

108. (Amended) The computer program of claim 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.

109. (Amended) The computer program of claim 108, wherein the deficiencies include unresolved words of the spoken request.

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170. (Amended) The computer program of claim 108, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken request.

1/1. (Amended) The computer program of claim 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.

142. (Amended) The computer program of claim 141, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

143. (Amended) The computer program of claim 1/2, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

(Amended) The computer program of claim 181, wherein code segment that solicits additional input displays an option menu.

145. (Amended) The computer program of claim 124, wherein the act of selecting from the displayed option menu is performed by speaking.

(Amended) The computer program of claim 101, wherein the code segments of the computer program operate with respect to a plurality of simultaneous users and corresponding client devices.

(Amended) The computer program of claim 121, 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. (Amended) The computer program of claim 101, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

(Amended) The computer program of claim 101, wherein the additional input is solicited upon receiving a user-input statement that additional information is required.

120. (Amended) The computer program of claim 101, 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. (Amended) The computer program of claim 101, wherein the code segment that solicits the additional input includes a code segment that presents a textual request for the additional input.

122. (Amended) The computer program of claim 101, wherein the code segment that solicits the additional input includes a code segment that produces an audible request for the additional input.

123. (Amended) The computer program of claim 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.

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124. (Amended) The computer program of claim 101, wherein additional input received from the user is at least partially speech based.

10 125. (Amended) The computer program of claim 101, wherein additional input received from the user includes no spoken input.

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126. (Amended) The compute program of claim 102, wherein code segments (d)-(e) are repeated until the navigational query is deemed adequate.

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 nonspoken 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.

128. (Amended) The method of claim 127, wherein the step of rendering an interpretation further includes deriving linguistic information by using a speech recognition engine and an NL parser.

129. (Amended) The method of claim 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.

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130. (Amended) The method of claim 129 wherein the step of extracting an input template includes dynamically scraping the online scripted interface.

121. (Amended) The method of claim 127, wherein the navigation query is constructed in the format of a database query language.

132. (Amended) The method of claim 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.

133. (Amended) The method of claim 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.

184. (Amended) The method of claim 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.

135. (Amended) The method of claim 134, wherein the deficiencies include unresolved words of the spoken NL request.

136. (Amended) The method of claim 134, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken NL request.

137. (Amended) The method of claim 137, 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. (Amended) The method of claim 121, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

139. (Amended) The method of claim 127, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

140. (Amended) The method of claim 127, wherein the input modality of step (d) includes selecting from a displayed option menu.

13/1. (Amended) The method of claim 140, wherein the act of selecting from the displayed option menu is performed by speaking.

47 (142. (Amended) The method of claim 127, wherein the method is performed with respect to a plurality of simultaneous users and corresponding client devices.

(Amended) The method of claim 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.

144. (Amended) The method of claim 127, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

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;

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

146. (Amended) The system of claim 146, wherein the spoken language processing logic includes speech recognition logic and an NL parsing logic for deriving linguistic information.

(A) 20 247. (Amended) The system of claim 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.

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148. (Amended) The system of claim 145, wherein the spoken language processing logic dynamically scrapes the online scripted interface.

149 (Amended) The system of claim 148, wherein the query construction logic constructs the query in the format of a database query language.

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150. (Amended) The system of claim 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.

(Amended) The system of claim 146, 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.

452. (Amended) The system of claim 145, wherein the user interaction logic solicits additional input in response to one or more deficiencies encountered during construction of the navigation query.

96 158. (Amended) The system of claim 152, wherein the deficiencies include unresolved words of the spoken NL request.

164. (Amended) The system of claim 162, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken NL request.

155. (Amended) The system of claim 146, 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. (Amended) The system of claim 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. (Amended) The system of claim 155, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

158. (Amended) The system of claim 255, wherein the user interaction logic displays an option menu.

159. (Amended) The system of claim 156, wherein the act of selecting from the displayed option menu is performed by speaking.

160. (Amended) The system of claim 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.

10/16/1. (Amended) The system of claim 145, wherein the electronic data source stores multimedia content including at least one of video content and audio content.

162. (Amended) The system of claim 145, wherein the display device receives data from the electronic data source on the network servers via a communications box.

193. (Amended) The system of claim 146, 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}.

(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;
- 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.

Segment that derives linguistic information by using a speech recognition engine and an NL parser.

M66. (Amended) The computer program of claim 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.

267. (Amended) The computer program of claim 66, further comprising a code segment that dynamically scrapes the online scripted interface.

168. (Amended) The computer program of claim 164, wherein the navigation query is constructed in the format of a database query language.

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(Amended) The computer program of claim 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.

(17) (Amended) The computer program of claim 194, 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. (Amended) The computer program of claim 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.

172. (Amended) The computer program of claim 171, wherein the deficiencies include unresolved words of the spoken NL request.

173. (Amended) The computer program of claim 171, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken NL request.

174. (Amended) The computer program of claim 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.

175. (Amended) The computer program of claim 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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1/76. (Amended) The computer program of claim 1/74, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

1/17. (Amended) The computer program of claim 1/64, wherein code segment that solicits additional input displays an option menu.

123 178. (Amended) The computer program of claim 177, wherein the act of selecting from the displayed option menu is performed by speaking.

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.

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. 124

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:

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.

188. (New) The method of claim 162, 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.

165. (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.

366. (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.

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

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,

Kin-Wah Tong, Attorney

Reg. No. 39,400 (732) 530-9404

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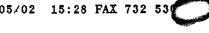
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Appendix

(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:

- receiving a spoken request for desired information from the user; (a)
- rendering an interpretation of the spoken request; (b)
- constructing at least part of a navigation query based upon the interpretation; (c)
- soliciting additional input from the user, including user interaction in a non-(d) 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
- transmitting the selected portion of the electronic data source from the network (g) 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] <u>60</u>. (Amended) The method of claim [1] <u>56</u>, wherein the navigation query is constructed in the format of a database query language.
- [6] <u>61</u>. (Amended) The method of claim [1] <u>56</u>, 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] <u>62</u>. (Amended) The method of claim [1] <u>56</u>, 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] <u>63</u>. (Amended) The method of claim [1] <u>56</u>, 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] <u>64</u>. (Amended) The method of claim [8] <u>63</u>, wherein the deficiencies include unresolved words of the spoken request.
- [10] <u>65</u>. (Amended) The method of claim [8] <u>63</u>, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken request.
- [11] <u>66</u>. (Amended) The method of claim [1] <u>56</u>, 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] <u>67</u>. (Amended) The method of claim [11] <u>66</u>, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

- [13] <u>68</u>. (Amended) The method of claim [11] <u>66</u>, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.
- [14] <u>69</u>. (Amended) The method of claim [1] <u>56</u>, wherein the additional input is solicited upon receiving a user-input statement that additional information is required.
- [15] <u>70</u>. (Amended) The method of claim [1] <u>56</u>, wherein the step of soliciting the additional input includes presenting a menu to the user on the client device of the user.
- [16] <u>71</u>. (Amended) The method of claim [1] <u>56</u>, wherein the step of soliciting the additional input includes presenting a textual request for the additional input.
- [17] <u>72</u>. (Amended) The method of claim [1] <u>56</u>, wherein the step of soliciting the additional input includes an audible request for the additional input.
- [18] <u>73</u>. (Amended) The method of claim [1] <u>56</u>, 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] <u>74</u>. (Amended) The method of claim [1] <u>56</u>, wherein additional input received from the user is at least partially speech based.
- [20] <u>75</u>. (Amended) The method of claim [1] <u>56</u>, wherein additional input received from the user includes no spoken input.
- [21] <u>76</u>. (Amended) The method of claim [1] <u>56</u>, wherein steps (d)-(e) are repeated until the navigational query is deemed adequate.

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- [22] <u>77</u>. (Amended) The method of claim [1] <u>56</u>, wherein the input modality of step (d) includes selecting from a displayed option menu.
- [23] <u>78</u>. (Amended) The method of claim [22] <u>77</u>, wherein the act of selecting from the displayed option menu is performed by speaking.
- [24] <u>79</u>. (Amended) The method of claim [1] <u>56</u>, wherein the method is performed with respect to a plurality of simultaneous users and corresponding client devices.
- [25] <u>80</u>. (Amended) The method of claim [1] <u>56</u>, 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] <u>81</u>. (Amended) The method of claim [1] <u>56</u>, wherein the electronic data source stores multimedia content including at least one of video content and audio content.
- [27] <u>82</u>. (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;

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- (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] <u>83</u>. (Amended) The system of claim [27] <u>82</u>, wherein the language processing logic includes speech recognition logic and an linguistic parsing logic for deriving linguistic information.
- [29] <u>84</u>. (Amended) The system of claim [27] <u>82</u>, 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] <u>85</u>. (Amended) The system of claim [29] <u>84</u>, wherein the language processing logic dynamically scrapes the online scripted interface.
- [31] <u>86</u>. (Amended) The system of claim [27] <u>82</u>, wherein the query construction logic constructs the query in the format of a database query language.
- [32] <u>87</u>. (Amended) The system of claim [27] <u>82</u>, 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] <u>88</u>. (Amended) The system of claim [27] <u>82</u>, wherein at least a portion of the language processing logic is hosted on a network computing device located remotely

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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.

- [41] <u>96</u>. (Amended) The system of claim [40] <u>95</u>, wherein the act of selecting from the displayed option menu is performed by speaking.
- [42] <u>97</u>. (Amended) The system of claim [27] <u>82</u>, 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] <u>98</u>. (Amended) The system of claim [27] <u>82</u>, 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, fiberoptic}.
- [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] <u>104</u>. (Amended) The computer program of claim [48] <u>103</u>, further comprising a code segment that dynamically scrapes the online scripted interface.
- [50] <u>105</u>. (Amended) The computer program of claim [46] <u>101</u>, 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

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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] <u>110</u>. (Amended) The computer program of claim [53] <u>108</u>, 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.

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- [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] <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] 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.
- [63] 118. (Amended) The computer program of claim [46] 101, wherein the electronic data source stores multimedia content including at least one of video content and audio content.
- [64] 119. (Amended) The computer program of claim [46] 101, wherein the additional input is solicited upon receiving a user-input statement that additional information is required.
- [65] 120. (Amended) The computer program of claim [46] 101, 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] 122. (Amended) The computer program of claim [46] 101, 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] <u>123</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 list of portions of the electronic data source that match the navigational query.

[69] <u>124</u>. (Amended) The computer program of claim [46] <u>101</u>, wherein additional input received from the user is at least partially speech based.

[70] <u>125</u>. (Amended) The computer program of claim [46] <u>101</u>, 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;
- constructing at least part of a navigation query based upon the interpretation;
- (d) soliciting additional input from the user, including user interaction in a nonspoken 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] <u>128</u>. (Amended) The method of claim [72] <u>127</u>, 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] <u>130</u>. (Amended) The method of claim [74] <u>129</u>, wherein the step of extracting an input template includes dynamically scraping the online scripted interface.
- [76] <u>131</u>. (Amended) The method of claim [72] <u>127</u>, 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] <u>134</u>. (Amended) The method of claim [72] <u>127</u>, 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.

- [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 <u>non-spoken</u> modality different than the original request <u>without requiring the user to request said non-spoken</u> 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] <u>146</u>. (Amended) The system of claim [90] <u>145</u>, 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] <u>148</u>. (Amended) The system of claim [90] <u>145</u>, 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] <u>151</u>. (Amended) The system of claim [90] <u>145</u>, 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.

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[98] <u>153</u>. (Amended) The system of claim [97] <u>152</u>, wherein the deficiencies include unresolved words of the spoken NL request.

[99] <u>154</u>. (Amended) The system of claim [97] <u>152</u>, 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] <u>158</u>. (Amended) The system of claim [100] <u>155</u>, wherein the user interaction logic displays an option menu.

[104] <u>159</u>. (Amended) The system of claim [103] <u>158</u>, 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 <u>non-spoken</u> modality different than the original request <u>without requiring the user to request said non-spoken modality;</u>
- (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] <u>168</u>. (Amended) The computer program of claim [109] <u>164</u>, 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] <u>170</u>. (Amended) The computer program of claim [109] <u>164</u>, 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] <u>171</u>. (Amended) The computer program of claim [109] <u>164</u>, 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] <u>173</u>. (Amended) The computer program of claim [116] <u>171</u>, wherein the deficiencies include one or more required elements of the navigational query not determinable from the interpretation of the spoken NL request.

[119] <u>174</u>. (Amended) The computer program of claim [109] <u>164</u>, 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] <u>175</u>. (Amended) The computer program of claim [119] <u>174</u>, wherein the deficiencies include existence of more than one data record within the data source responsive to the navigation query.

[121] <u>176</u>. (Amended) The computer program of claim [119] <u>174</u>, wherein the deficiencies include failure to identify a single data record within the data source responsive to the navigation query.

[122] <u>177</u>. (Amended) The computer program of claim [109] <u>164</u>, wherein code segment that solicits additional Input displays an option menu.

[123] <u>178</u>. (Amended) The computer program of claim [122] <u>177</u>, 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

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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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After Final	Petition	า		Proprietary Information			
Affidavits/declaration(s)		n to Convi ional Appi		Status Letter			
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Certified Copy of Priority Document(s)	Rema	Please charge the \$138 additional claim fee (6 total claim \$9 each; 2 independent claims at \$42 each) and any other due to Applicants' Attorneys' Deposit Account No. 20-07 duplicate copy of this transmittal is enclosed to facilitate charge.		nt claims at \$42 each) and any other fees torneys' Deposit Account No. 20-0782. A			
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 KIN-WAH TONG, REG. NO. 39,400							
Signature Palalla							
Date August 5, 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 send to the Chief Information Officer, U.S. Patent and Trademerk 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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Other Enclosure(s) (please identity below):	Power of Attorney, Revocation Change of Correspondence Address		Request	Extension of Time	
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Received from < 732 530 9808 > at 8/5/02 4:33:12 PM [Eastern Daylight Time]



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	Application No.	Applicant(s)	(
Matica of Allowshilling	09/524,095	HALVERSON ET AL.				
Notice of Allowability	Examiner	Art Unit				
	Firmin Backer	3621				
The MAILING DATE of this communication app All claims being allowable, PROSECUTION ON THE MERITS IS herewith (or previously mailed), a Notice of Allowance (PTOL-85 NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT R of the Office or upon petition by the applicant. See 37 CFR 1.31: 1. This communication is responsive to August 7 th , 2002.	(OR REMAINS) CLOSED in this ap) or other appropriate communicatio RIGHTS. This application is subject	oplication. If not included n will be mailed in due course	e. THIS e initiative			
2. The allowed claim(s) is/are 56-187.						
3. The drawings filed on are accepted by the Examine	er.					
 4. ☐ Acknowledgment is made of a claim for foreign priority un a) ☐ All b) ☐ Some* c) ☐ None of the: 	der 35 U.S.C. § 119(a)-(d) or (f).					
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2. Certified copies of the priority documents have						
3. Copies of the certified copies of the priority do	ocuments have been received in this	national stage application fro	om the			
International Bureau (PCT Rule 17.2(a)).						
* Certified copies not received:		Sanat and the North				
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Applicant has THREE MONTHS FROM THE "MAILING DATE" of below. Failure to timely comply will result in ABANDONMENT of						
7. A SUBSTITUTE OATH OR DECLARATION must be subminformal PATENT APPLICATION (PTO-152) which gives real			E OF			
8. CORRECTED DRAWINGS must be submitted.						
(a) including changes required by the Notice of Draftsper	rson's Patent Drawing Review (PTC	0-948) attached				
1) hereto or 2) to Paper No						
(b) including changes required by the proposed drawing	correction filed, which has b	peen approved by the Examir	ner.			
(c) [including changes required by the attached Examine	r's Amendment / Comment or in the	Office action of Paper No	·			
Identifying indicia such as the application number (see 37 CFR of each sheet. The drawings should be filed as a separate paper			back)			
9. DEPOSIT OF and/or INFORMATION about the deposit attached Examiner's comment regarding REQUIREMENT FOR	osit of BIOLOGICAL MATERIAL THE DEPOSIT OF BIOLOGICAL MA	must be submitted. Note th ATERIAL.	ne			
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.						
U.S. Patent and Trademark Office						
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DISH, Exh. 1002, p. 288

Application/Control Number: 09/524,095 Page 2

Art Unit: 3621

Response to Amendment

This is in response to an amendment file on August 7th, 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."

DISH, Exh. 1002, p. 289

Application/Control Number: 09/524,095

Art Unit: 3621

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

Page 3



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

NOTICE OF ALLOWANCE AND FEE(S) DUE

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12/16/2002

PERKINS COIE LLP 101 JEFFERSON DRIVE MENLO PARK, CA 94025-1114

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3621	709-218000

DATE MAILED: 12/16/2002

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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

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. <u>PROSECUTION ON THE MERITS IS CLOSED</u>. 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.

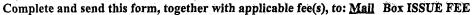
III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Box ISSUE FEE unless advised to the contrary.

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.

Page 1 of 4

PTOL-85 (REV. 04-02) Approved for use through 01/31/2004.

PART B - FEE(S) TRANSMITTAL



Commissioner for Patents Washington, D.C. 20231 (703)746-4000

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PTOL-85 (REV. 04-02) Approved for use through 01/31/2004. OMB 0651-0033



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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/524,095	03/13/2000	Christine Halverson	SRI1P037	6294
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MENLO PARK, C	CA 94025-1114	·	ART UNIT	PAPER NUMBER
UNITED STATES			3621	
		D.	ATE 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.

Page 3 of 4

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO
09/524,095	03/13/2000	Christine Halverson	SRI1P037	6294
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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.

Page 4 of 4

PTOL-85 (REV. 04-02) Approved for use through 01/31/2004.







IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION

Filed: **March 13, 2000**

Applicant: Halverson et al.

Case: SRI1P037

Serial No.: 09/524,095

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

SIR:

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 nonspoken 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.

3/17/03

Respectfully submitted,

Kin-Wah Tong, Attorney Reg. No. 39,400

Reg. No. 39,400 (732) 530-9404

Moser, Patterson & Sheridan, LLP 595 Shrewsbury Avenue First Floor, Suite 100 Shrewsbury, New Jersey 07702 AUG 1 3 2002

Attorney Docke

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ு நீreby certify that this correspondence is being deposited with the U.S. Postal Service with sufficient postage as நீr்கt Class Mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C., 20231, on:

Date: August 6, 2002

By: 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

RECEIVED

AUG 1 5 2002

Technology Center 2100

<u>Information Disclosure Statement After First Office Action but</u> <u>Before Final Action or Notice of Allowance – 37 CFR 1.97(c)</u>

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.

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2. <u>Cited Information</u>

- 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.

Date: 6 Aug 2007

Respectfully submitted, Perkins Coie LLP

Brian R. Coleman

Registration No. 39,145

Correspondence Address:

Customer No. 22918
Perkins Coie LLP
P.O. Box 2168
Menlo Park, California 94026
(650) 838-4300

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AUG 1 3 2002 Form PTO-1449 (Modified) (Use several sheets if necessary)				Application Number	42,095		
				Confirmation Number			
				Filing Date	March 13, 2000		
				First Named Inventor	Halverson		
				Group Art Unit	2155		
				Examiner Name	Backer		
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Technology, London, April 1997



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE #35m

In re application of:

Halverson, et al.

Serial No.:

09/524,095

Art Unit: 3621

Filing Date:

March 13, 2000

Examiner: Backer, Firmin

For:

MAVIGATING NETWORK-BASED ELECTRONIC INFOMRATION USING SPUKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR

FEEDBACK

Docket No.

SRI 4116-3

Assistant Commissioner for Patents Washington, D.C. 20231 SIR:

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)

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March 17, 2003

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Halverson, et al.

"NAVIGATING WORK-BASED ELECTRONIC INFORMATION SING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK"

Serial No. 09/524,095 SRI 4116-3/ KWT

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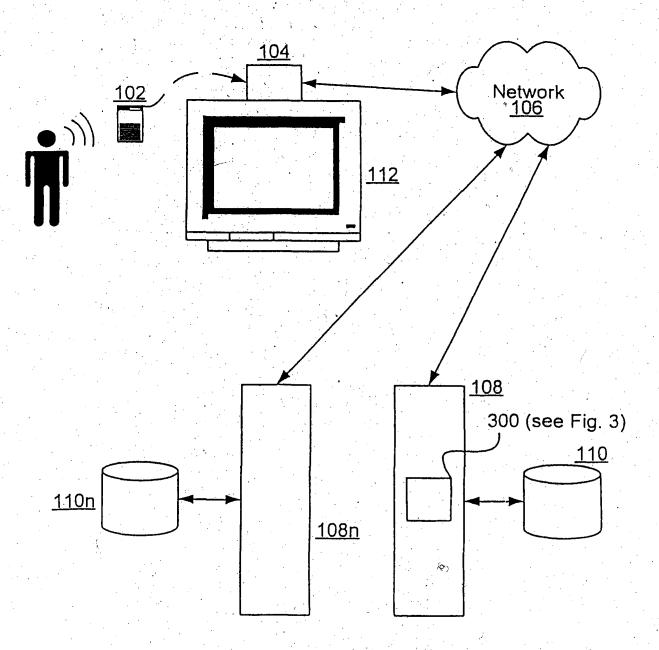


Fig. 1a

Halverson, et al.

"NAVIGATING WORK-BASED ELECTRONIC INFORMAT: USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK"

Serial No. 09/524,095 - SRI 4116-3/ KWT



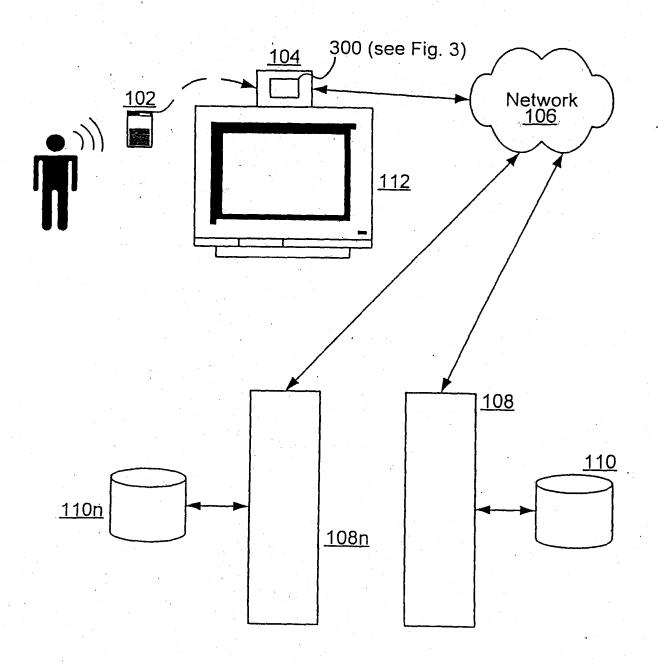


Fig. 1b

Halverson, et al.

"NAVIGATING WORK-BASED ELECTRONIC INFORMATI JSING SPOKEN
NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK"

Serial No. 09/524,095 - SRI 4116-3/ KWT



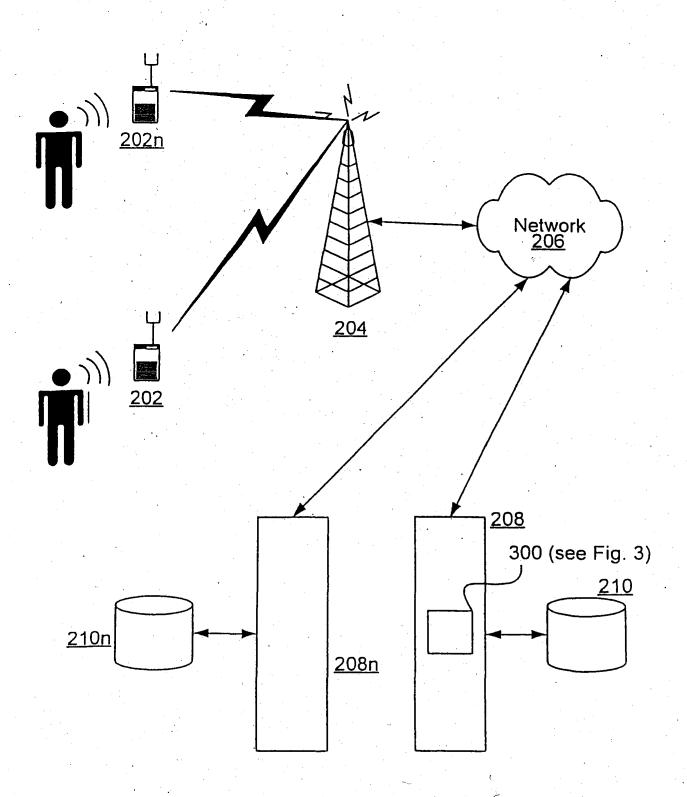
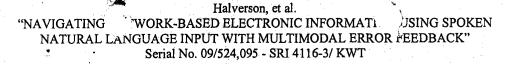


Fig. 2





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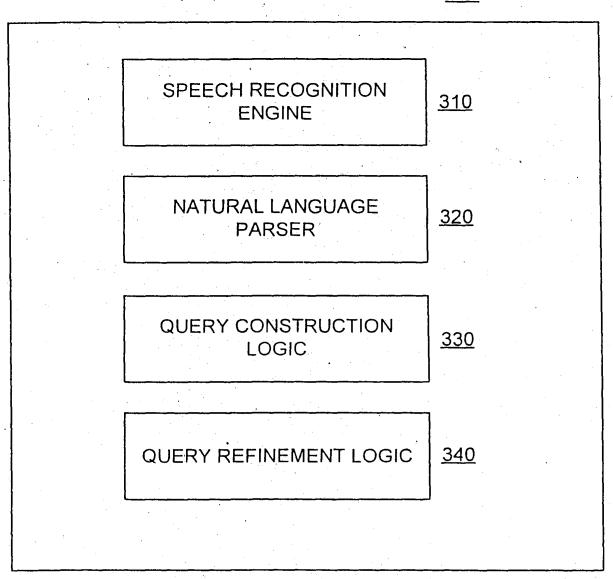


Fig. 3

Halverson, et al.

"NAVIGATING. WORK-BASED ELECTRONIC INFORMATI JSING SPOKEN
NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK"

Serial No. 09/524,095 - SRI 4116-3/ KWT

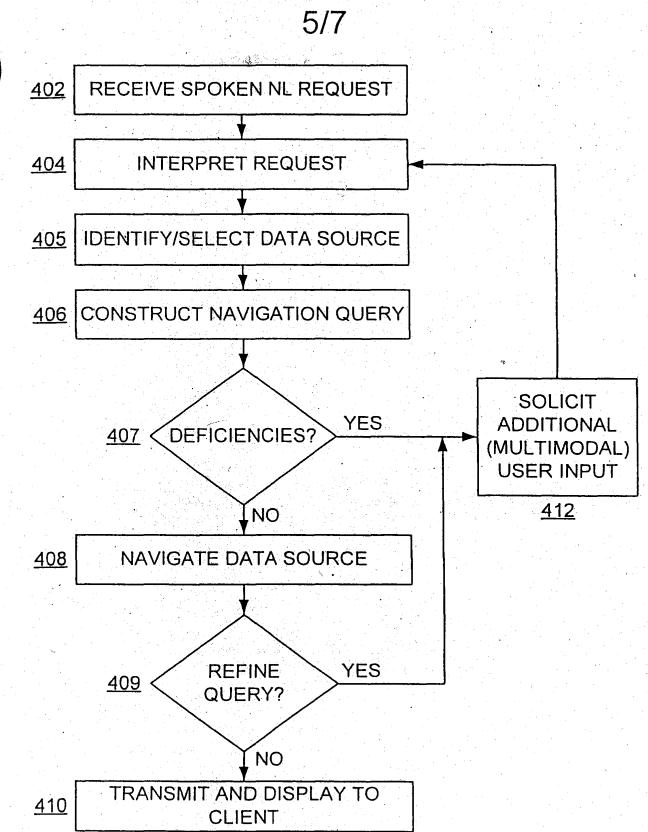
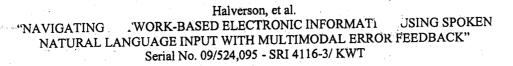


Fig. 4





(from step 406, Fig. 4)

SCRAPE THE ONLINE SCRIPTED FORM TO EXTRACT AN INPUT TEMPLATE

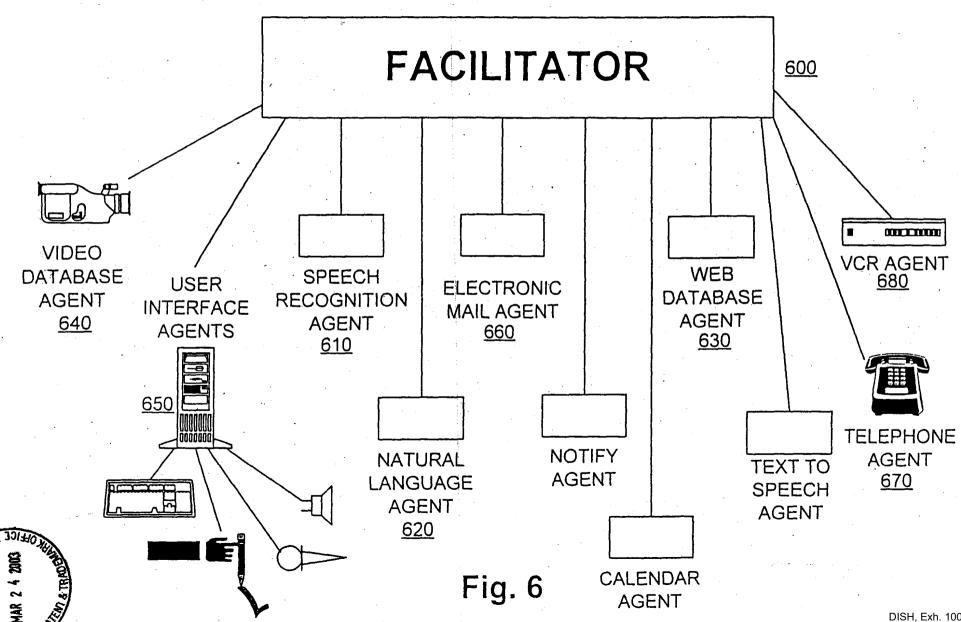
INSTANTIATE THE INPUT TEMPLATE USING INTERPRETATION OF STEP 404

(to step 407, Fig. 4)

Fig. 5

Serial No. 09/524,095 - SRI 4116-3/ KWT

7/7



DISH, Exh. 1002, p. 309

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PART B - FEE(S) TRANSMITTAL

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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. 101 JEFFERSON DRIVE MENLO PARK, CA 94025-1114 03/28/2003 HMARZI2 00000050 200782 09524095 DENARD HOVIL 650.00 CH 3.00 CH APPLICATION NO. FILING DATE FIRST NAMED INVENTOR ATTORNEY DOCKET NO. CONFIRMATION NO. 03/13/2000 TITLE OF INVENTION: NAVIGATING NETWORK-BASED BLECTRONIC INFORMATION USING SPOKEN NATURAL LANGUAGE INPUT WITH MULTIMODAL ERROR FEEDBACK APPLN. TYPE SMALL ENTITY ISSUE FEE PUBLICATION FEE TOTAL FEE(S) DUE DATE DUE 03/17/2003 YES EXAMINER ART UNIT CLASS-SUBCLASS BACKER, FIRMIN 3621 709-218000 Change of correspondence address or indication of "Fee Address" (37 CFR 1.363). 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 Moser, Patterson & Sheridan, LLP. ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached. 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. 2Kin-Wah Tong, Esq. The Address indication (or "Fee Address Indication form PTO/BB/47; Rev 03-02 or more recent) attached. Use of a Custom 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 haben previously submitted to the USPTO or is being submitted under separate cover. Completion of this form is NOT a substitute for filing an assignment.

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b. Applicant(s)	g. Disclaimer	I. Print Fig.	q. PTOL-85b
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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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CA (US)

(*) Notice: Subject to any disclaimer, the term of this

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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	 COSE	15/16
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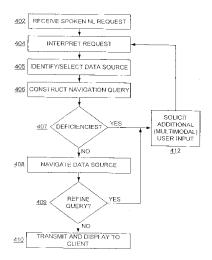
Primary Examiner—James P. Trammell Assistant Examiner—Firmin Backer

(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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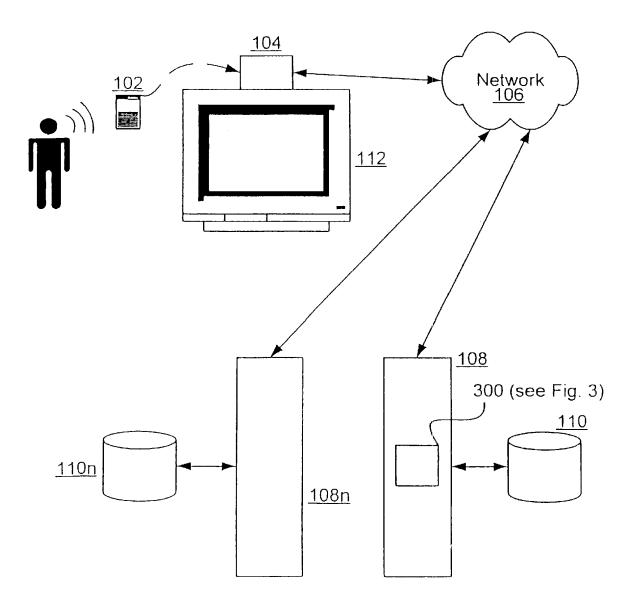


Fig. 1a

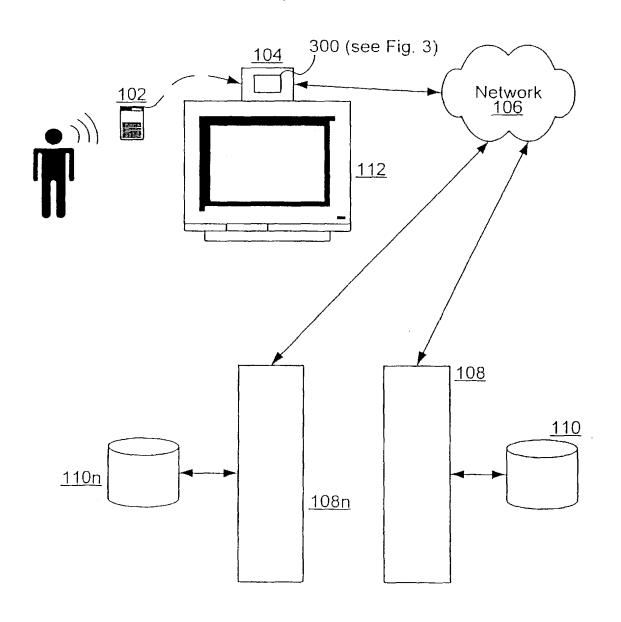


Fig. 1b

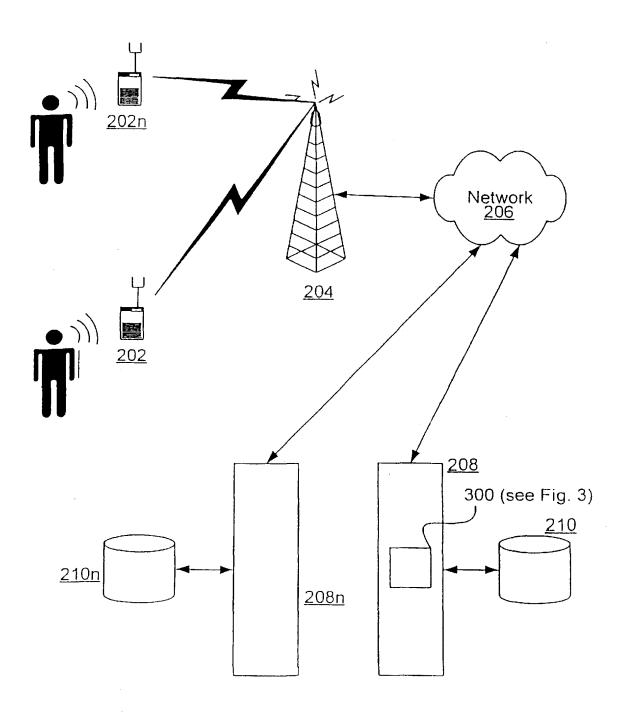


Fig. 2

REQUEST PROCESSING LOGIC 300

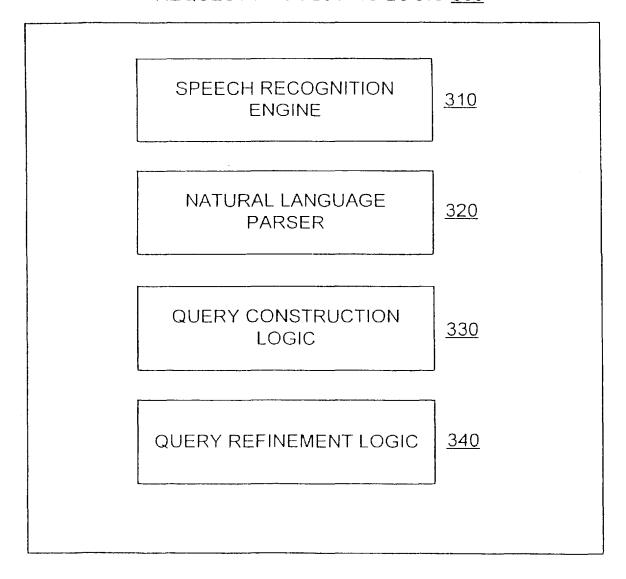


Fig. 3

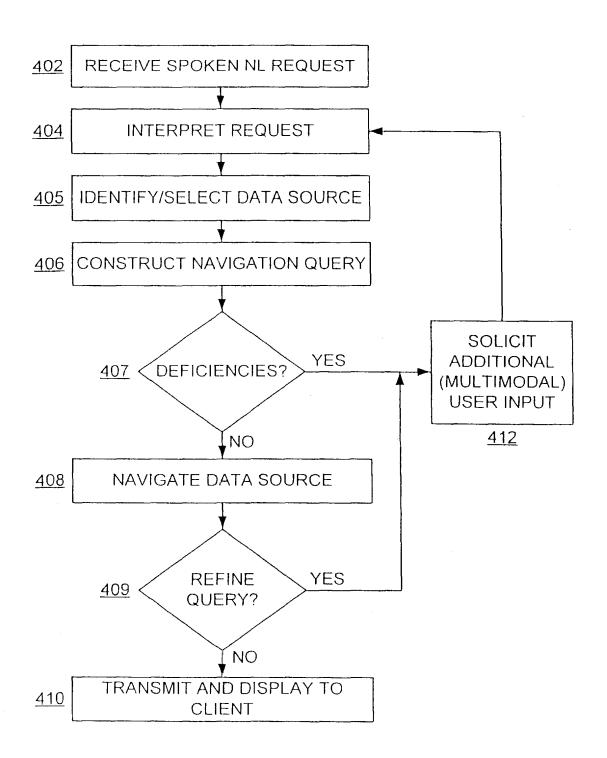


Fig. 4

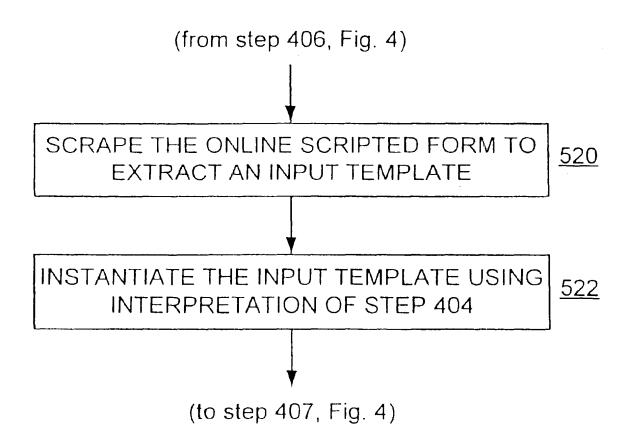
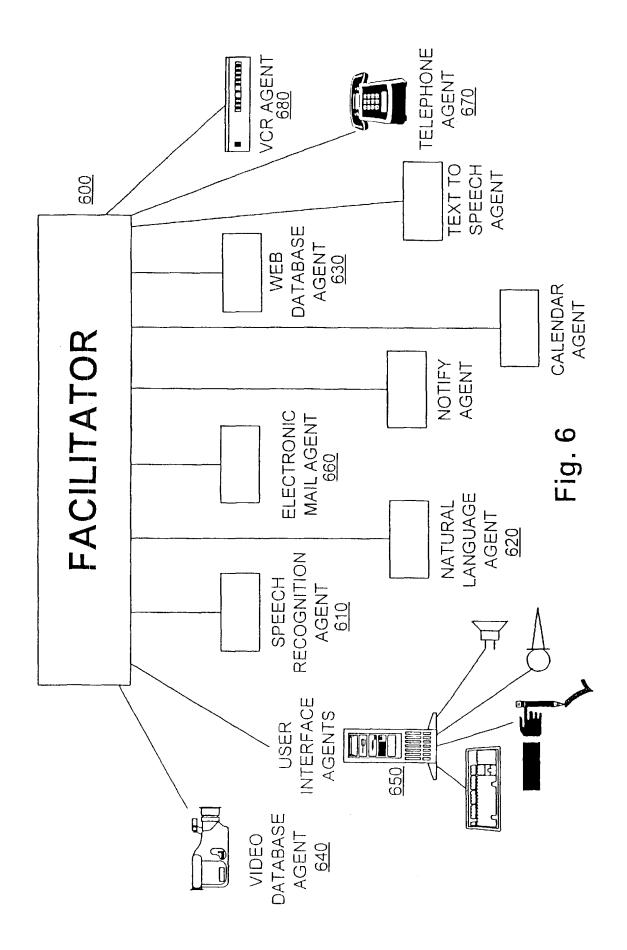


Fig. 5

Petitioner Microsoft Corporation - Ex. 1008, p. 669



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 10 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 15 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 20 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— 25 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) 30 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 35 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 40 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 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 50 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 55 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 lan- 60 guage 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., 65 "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 underconstrained requests ("Show me the Clint Eastwood movie"). An approach is needed for handling and resolving such errors and ambiguities in a rapid, user-friendly, nonfrustrating 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-ata-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 interpretanetworks for general information, multimedia content, or 45 tion 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 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 5 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. 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;

FIG. 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;

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. 1a is an illustration of a data navigation system driven by spoken natural language input, in accordance with 45 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 helddown to activate a listening mode, so that the system need 50 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 55 102 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 60 106. 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 65 transmission), in the latter case being digitized upon arrival at remote server 108.

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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. 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 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 15 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) 25 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 30 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 35 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 40 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 45 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 50 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 55 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. 1 a may be implemented by replacing voice input device 102, communications box 104, and client display device 112, 60 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 65 natural language input requests from the user in the form of voice data, and transmits that data (preferably via wireless

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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 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 10 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 15 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, 20 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 25 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 30 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, 35 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 40 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 45 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 recogni- 50 tion 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 55 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 65 Parser," both of which are currently available online at http://www.ai.sri.com/natural-language/projects/arpa-sls/

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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/spnlint.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

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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 5 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 10 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 20 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 30 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 40 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 45 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 automati- 50 cally 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 55 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 60 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

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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, nonvoice 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 onemonth 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 5 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 15 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 20 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" 25 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 35 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 40 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 45 330 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", 50 "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 55 112 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 60 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 65 Unforgiven," having now been reminded of the title by the menu display.

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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 10 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 ArchitectureTM (OAA®) is a software 5 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 10 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 15 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 20 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 25 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 30 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 process-35 ing 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 abovereferenced co-pending patent application, especially FIG. 13 and the corresponding discussion of a "multi-modal maps" 45 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" avail- 50 able 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 55 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 Battle-field 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", 65 Washington, DC, pp. 1–7, Association for Computational Linguistics

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"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 sched-

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, ¹⁵ 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 40 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 50 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 60 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

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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.

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- 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 5 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 inter-
- 31. The system of claim 27, wherein the guery 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 15 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 com- 20 puting 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 25 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 30 include one or more required elements of the navigational query not determinable from the interpretation of the spoken
- 37. The system of claim 27, wherein the user interaction logic solicits additional input in response to one or more 35 of the interpretation and the construction of the navigation 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 50 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 55 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 60 group: {coaxial cable, DSL, satellite, wireless/cellular, fiberoptic \}.
- 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 65 or more network servers located remotely from a user, comprising:

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- (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 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
- 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 ²⁰ 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 35 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 50 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 65 to the data source, and using the input template to construct the navigation query.

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- 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;

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(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, 5 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 ³⁵ 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 40 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 55 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 60 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 65 group: {coaxial cable, DSL, satellite, wireless/cellular, fiberoptic}.

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- 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 5 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 15 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 20 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

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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.

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

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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.	 	G	06F 15/16
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		709/219	; 709/227	7; 704/257

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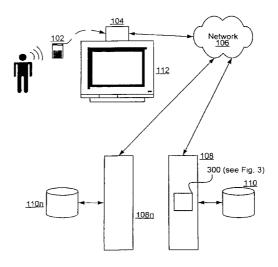
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(57) ABSTRACT

A system, method, and article of manufacture are provided for navigating an electronic data source by means of spoken language 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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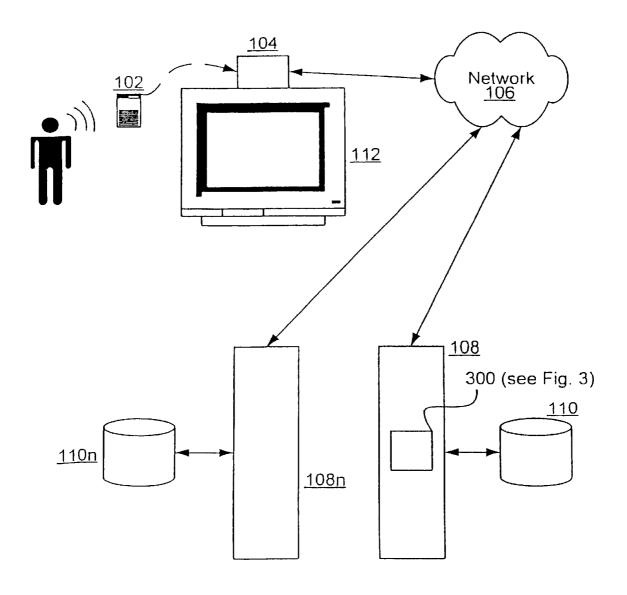


Fig. 1a

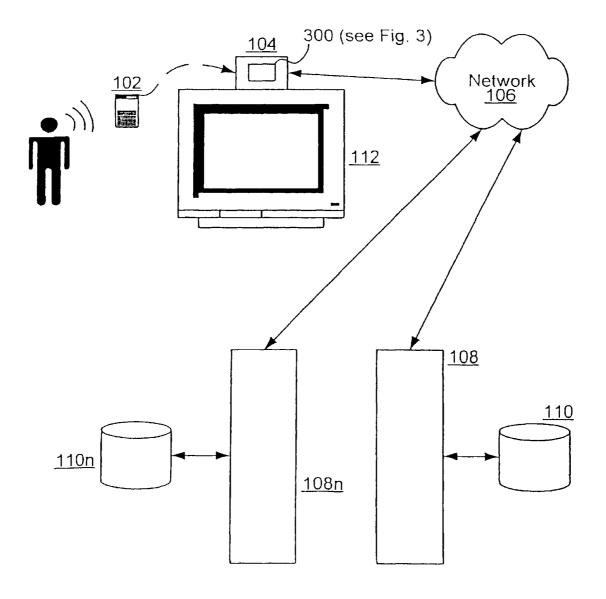


Fig. 1b

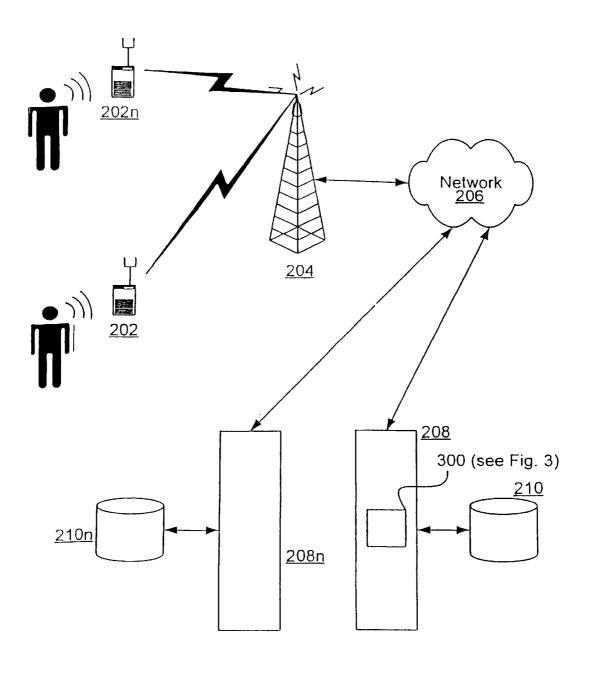


Fig. 2

REQUEST PROCESSING LOGIC 300

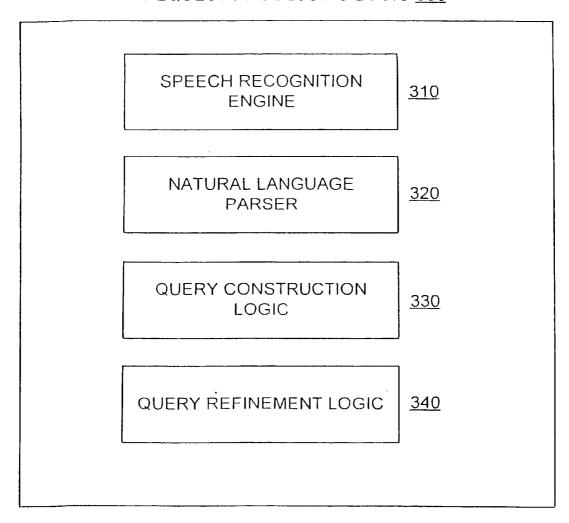


Fig. 3

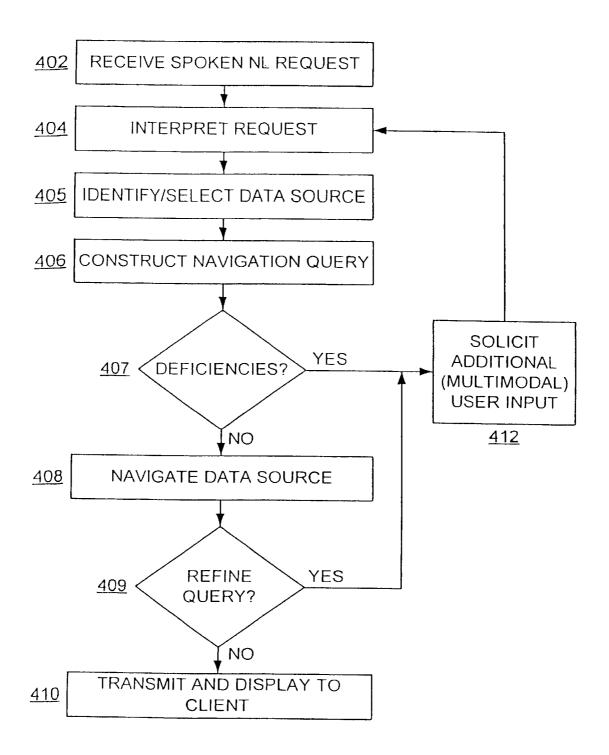


Fig. 4

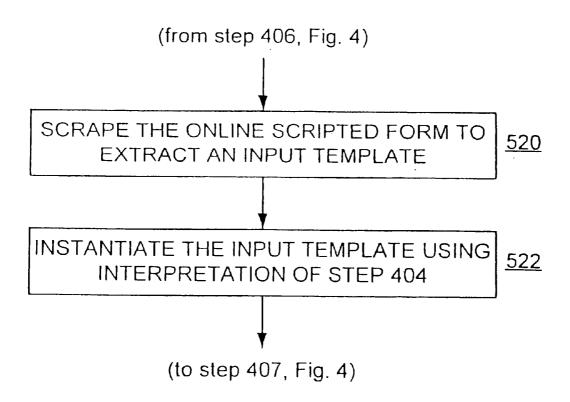
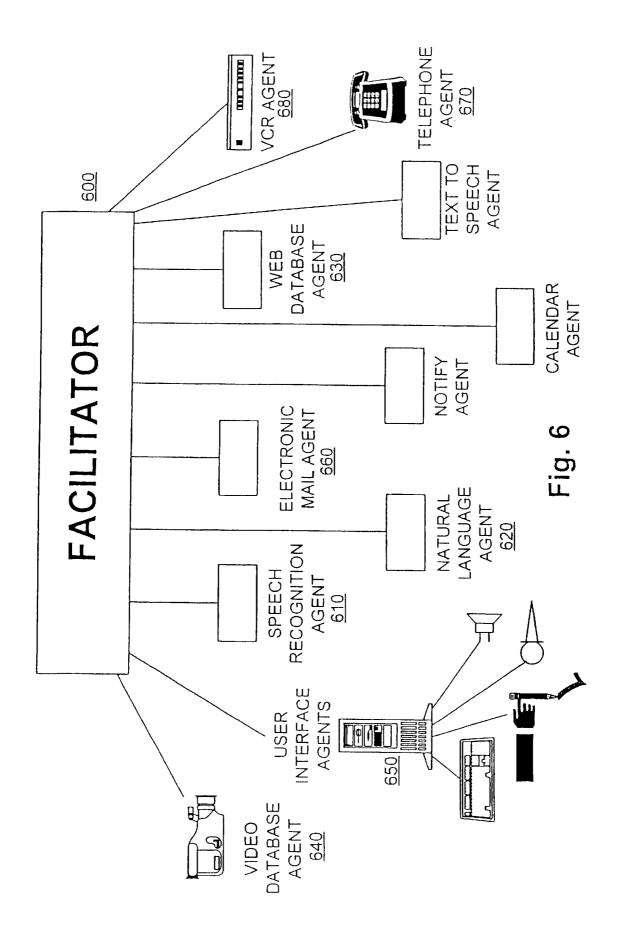


Fig. 5



MOBILE NAVIGATION OF NETWORK-BASED ELECTRONIC INFORMATION USING SPOKEN INPUT

This application is a continuation of an application 5 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 10 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. 60/124,719, 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 30 navigate and access desired data by means of natural language input. In many of the most important marketsincluding 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 40 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 45 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 50 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, 55 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 60 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. 65 In order to deliver a true "win" for users, the voice-driven front-end must accept spoken natural language input in a

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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 navi- 5 gational 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 15 dynamically scraping the online scripted interface.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention, together with further advantages thereof, 20 may best be understood by reference to the following description taken in conjunction with the accompanying drawings in which:

FIG. 1a illustrates a system providing a spoken natural language interface for network-based information 25 navigation, in accordance with an embodiment of the present invention with server-side processing of requests;

- FIG. 1b illustrates another system providing a spoken natural language interface for network-based information navigation, in accordance with an embodiment of the 30 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. 1a is an illustration of a data navigation system driven by spoken natural language input, in accordance with 55 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 helddown to activate a listening mode, so that the system need 60 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 65 driven by spoken natural language input, in accordance with 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 10 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 userusing 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 50 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. 1b is an illustration of a data navigation system 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 10 300 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

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 20 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 25 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) 35 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 40 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 45 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 50 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 55 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 60 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 65 embodiments of either FIG. 1a or FIG. 1b. For example, as depicted in FIG. 2, a mobile variation in accordance with the

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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 15 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. 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