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Haverstock et al.

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(54) **WEB SERVER WITH ABILITY TO PROCESS URL REQUESTS FOR NON-MARKUP LANGUAGE OBJECTS AND PERFORM ACTIONS ON THE OBJECTS USING EXECUTABLE INSTRUCTIONS CONTAINED IN THE URL**

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(*) Notice: Under 35 U.S.C. 154(b), the term of this patent shall be extended for 0 days.

This patent is subject to a terminal disclaimer.

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Related U.S. Application Data

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(51) **Int. Cl.**[7] **G06F 15/16**; G06F 15/17

(52) **U.S. Cl.** **709/245**; 709/201; 709/202; 707/513

(58) **Field of Search** 707/513; 709/202, 709/245

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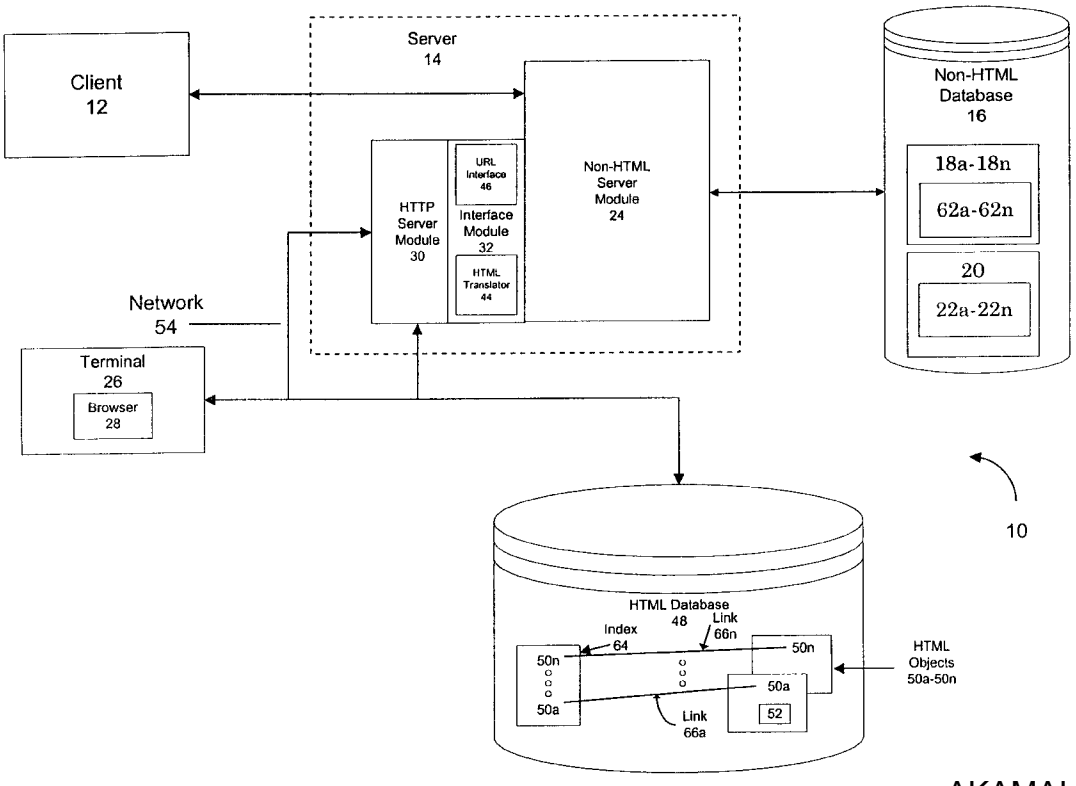
(57) **ABSTRACT**

A system for enabling access to non-HTML objects from a web browser. The system includes a database for storing non-HTML objects. A system user requests a non-HTML object from a database using a web browser. The web browser transmits the request to a server via a HTTP server and module. The server locates and retrieves the document requested. The module translates the document to a format supported by the web browser. The HTTP server communicates the translated object to the web browser over a network. The web browser then presents the translated object to the system user. The system also enables a server to respond to a URL requests containing action commands from a browser. Action commands and additional arguments are input into the URL. The server receives the request for the URL and processes the actions and arguments identified in the URL.

16 Claims, 3 Drawing Sheets



AKAMAI

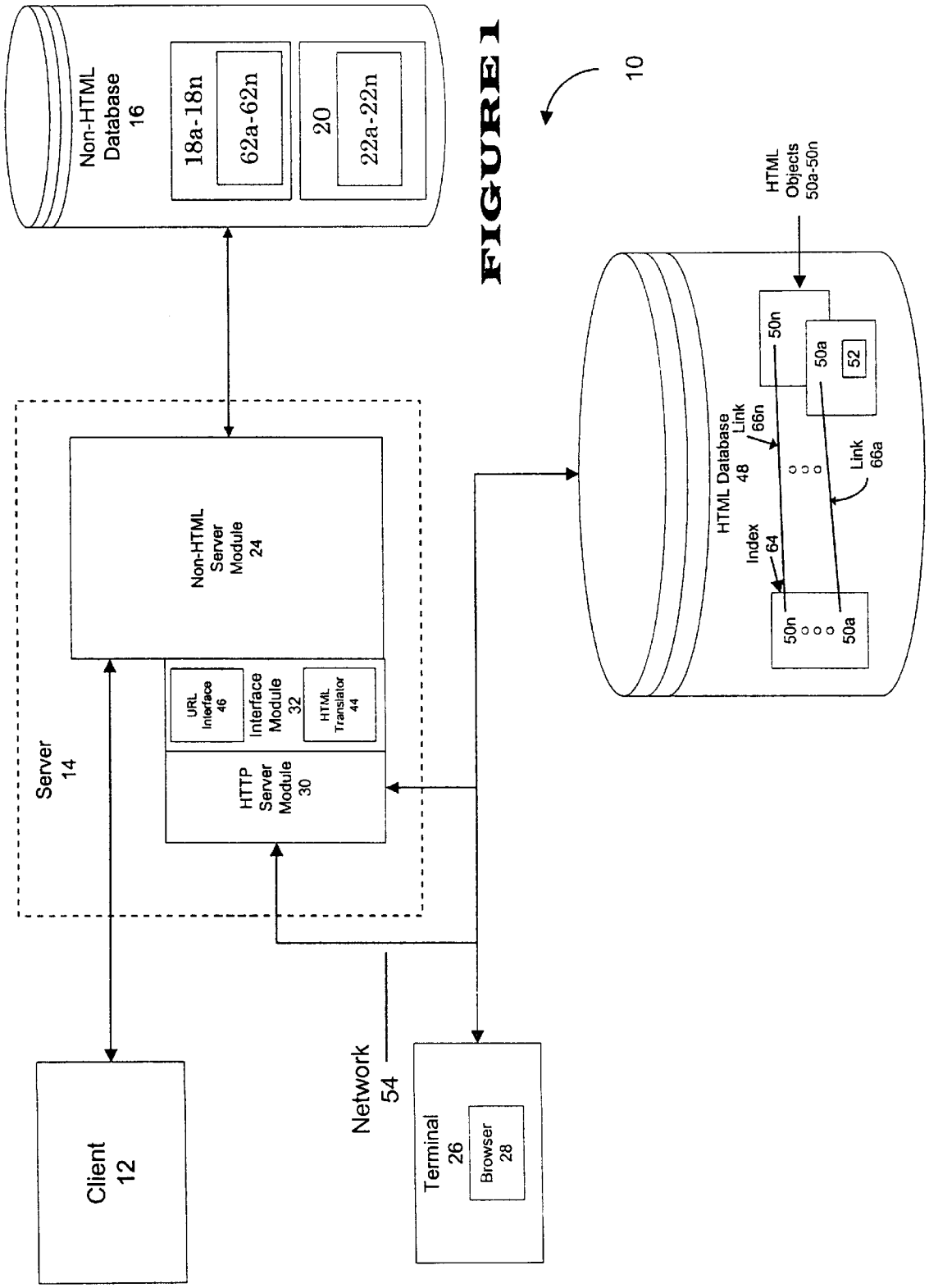


FIGURE 1

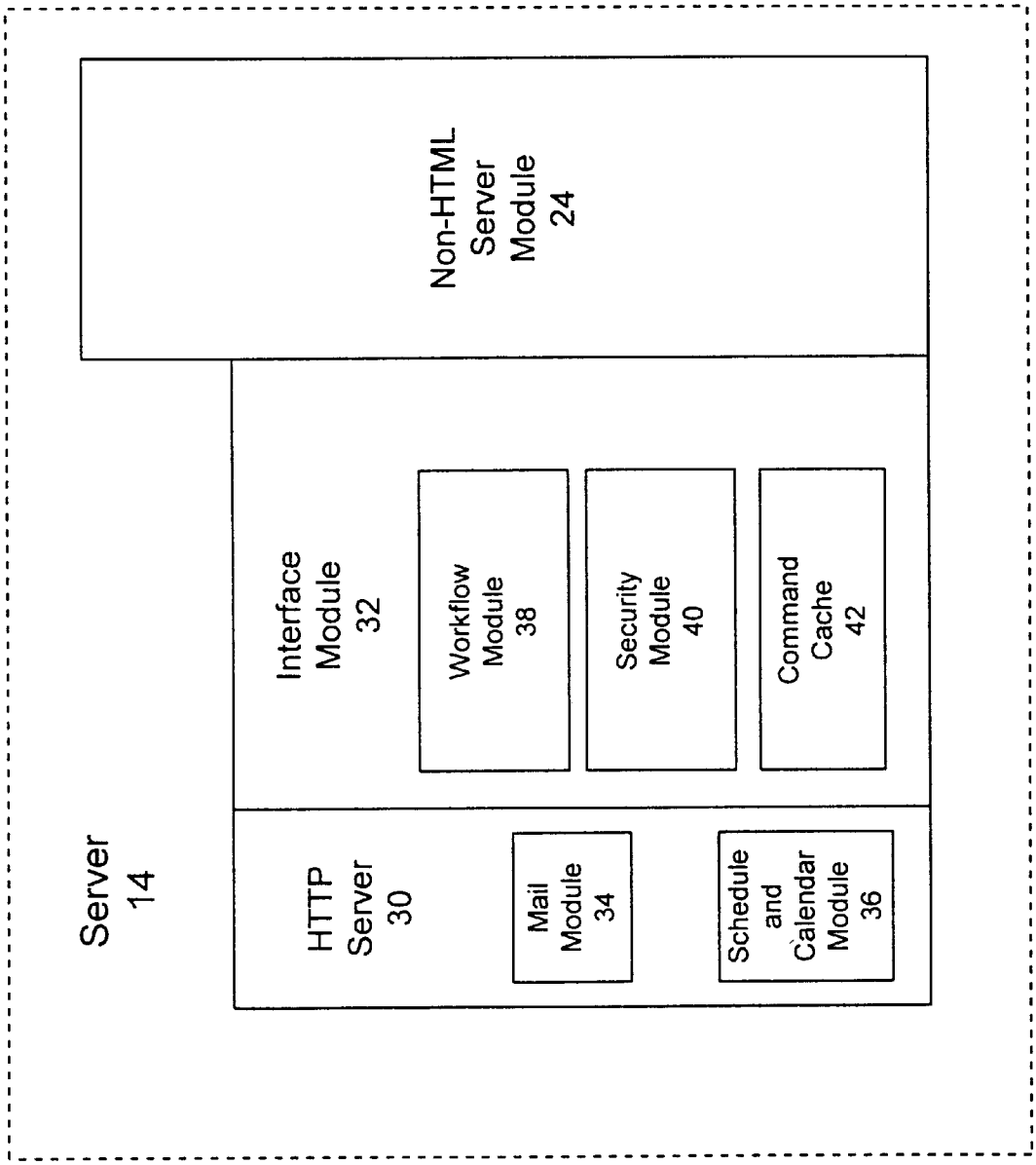


Figure 2

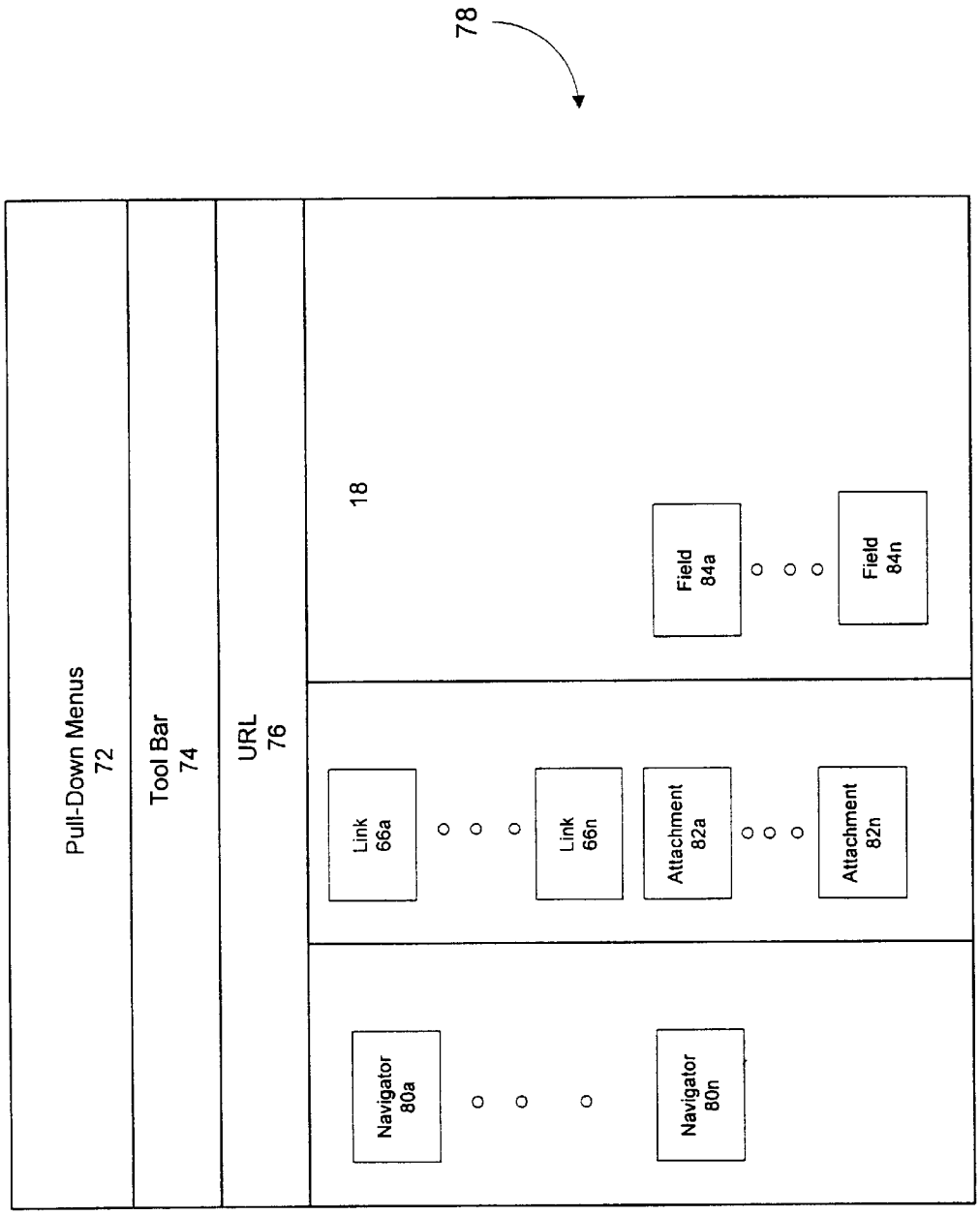


Figure 3

WEB SERVER WITH ABILITY TO PROCESS URL REQUESTS FOR NON-MARKUP LANGUAGE OBJECTS AND PERFORM ACTIONS ON THE OBJECTS USING EXECUTABLE INSTRUCTIONS CONTAINED IN THE URL

RELATED APPLICATIONS

This application claims priority based on U.S. Provisional Patent Application Ser. No. 60/050,153, entitled "Web Server Application," filed Jun. 19, 1997. This application is also related to co-pending U.S. patent applications entitled, "Web Server Enabling Browser Access to HTML and Non-HTML Documents," Serial No. 09/100,131, filed herewith, "Web Server With Direct Mail Capability," Serial No. 09/100,130, filed herewith, "Web Server With Automated Workflow," Serial No. 09/100,129, filed herewith, "Web Server Providing Role-Based Multi-level Security," Serial No 09/100,128 filed herewith, "Web Server With Unique Identification of Linked Objects," Ser. No. 09/100,118, filed herewith, "Web Server With Integrated Scheduling and Calendaring," Ser. No. 09/100,119, filed herewith, "Web Server Providing HTML Pages Embedded With Non-HTML Views," Ser. No. 09/100,120, filed herewith, and "Web Server Enabling Attachment of HTML and Non-HTML Files To Web Pages," Ser. No. 09/100,121, filed herewith.

FIELD OF THE INVENTION

The invention relates to a web server that has the ability to process a URL with action commands.

BACKGROUND OF THE INVENTION

Web browsers such as Netscape Navigator and Microsoft Internet Explorer are well known. Web browsers are software residing on a client (e.g., a personal computer). Via the browser, the client can communicate with a web server to enable access to and viewing of Hypertext Markup Language (HTML) documents. A web server typically includes a server (e.g., a UNIX- or Windows NT-based computer) connected to a network (e.g., the Internet, an intranet or other network), web server software configured with the host name of the server and the location of HTML objects on the servers and the HTML objects stored by that server.

In general operation, to access a web page, a user enters a request by specifying a uniform resource locator (URL) via the browser and hitting "Submit" (or another function key) and the URL is sent to the web server using HTTP. The web server responds by locating the requested HTML document and returning it to the browser. The browser receives the HTML document, interprets the HTML codes, translates them into a web page, and displays the web page. In this way, web browsers enable access to the vast number of HTML documents via the World Wide Web, the Internet or intranets. HTML generally is well known. A primary purpose of HTML is to describe how to format the text (and other content) of a web page. HTML uses tags to indicate how text of a web page should be displayed and to specify the URL of objects to which a page is linked. HTML objects are commonly stored on a web server as standard text files with a HTM or HTML extension. Linking is a powerful feature of HTML. One drawback with HTML links is that links are created by coding a page with HTML tags to link it to other objects (e.g., another document or a specific location within a document). Therefore creating web pages and links requires a working knowledge of HTML and the time required to write HTML code a create a page and any

desired links. Editing an HTML page or a link typically requires using HTML to edit the original web page or link. One significant problem with HTML links is that if a web page (or other object is linked to it) is moved or deleted any links to that page or object needs to be manually changed or a "file not found" message will appear when a user clicks on the link.

One limitation of web browsers and web servers is that they were designed primarily to access HTML documents. Browsers typically cannot cause a web server to retrieve and return non-HTML documents. This inhibits a user from accessing non-HTML documents, objects or databases from a web browser. Non-HTML objects, for example, may include non-HTML documents, stored views for documents in a database, identification files stored in a user directory and many other types of objects. Views provide a convenient way to index a plurality of documents. Identification files may comprise information about a system user (e.g., electronic mail address, role, profile, etc.).

One example of a non-HTML database is Lotus Notes. Lotus Notes is a popular software system, rich with a number of well-known functions. These functions, however, are typically accessed via a client terminal (loaded with Lotus Notes client software) communicating with a server (loaded with Lotus Notes server software). Because Notes is not an HTML-based application, it has not been practical to access objects in a Notes database via a standard web browser.

Standard web servers can read a URL to locate a page in pages specified in the URL. One limitation of existing browser/web server systems is that they cannot access non-page based databases. For example, a known, popular database is Lotus Notes®. Notes® databases include Forms, Document Views, etc. Because URLs specify page locations, URLs have not to date been useable to access other types of objects.

Using browser technology, a system user can read or fill out a form with data to create a page. But cannot, for example, create a form from a web client (browser). Typically, this requires programming (e.g., using a computer gateway interface (CGI)). A simple example, is as follows:

```
<FORM METHOD=POST ACTION=PCWEEK/
PROCESS.EXE>

<INPUT TYPE=TEXT NAME=SSN>

</FORM>
```

This simple code resides on the web server.

SUMMARY OF THE INVENTION

One object of the invention is to overcome these and other drawbacks present in existing systems.

Another object of the invention is to provide a web server that can respond to requests from a web browser for either HTML or non-HTML documents and return the requested documents to the web browser.

Another object of the invention is to provide web browser access to objects other than HTML pages by incorporating action commands into URLs.

Other objects and advantages of the invention also exist.

According to one embodiment of the invention, the system comprises a novel web server for a client/server network, where the client side is equipped with a standard browser. The server comprises standard web server func-

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