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(54) **SEARCH ENGINE REQUEST METHOD, PRODUCT, AND APPARATUS**

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See application file for complete search history.

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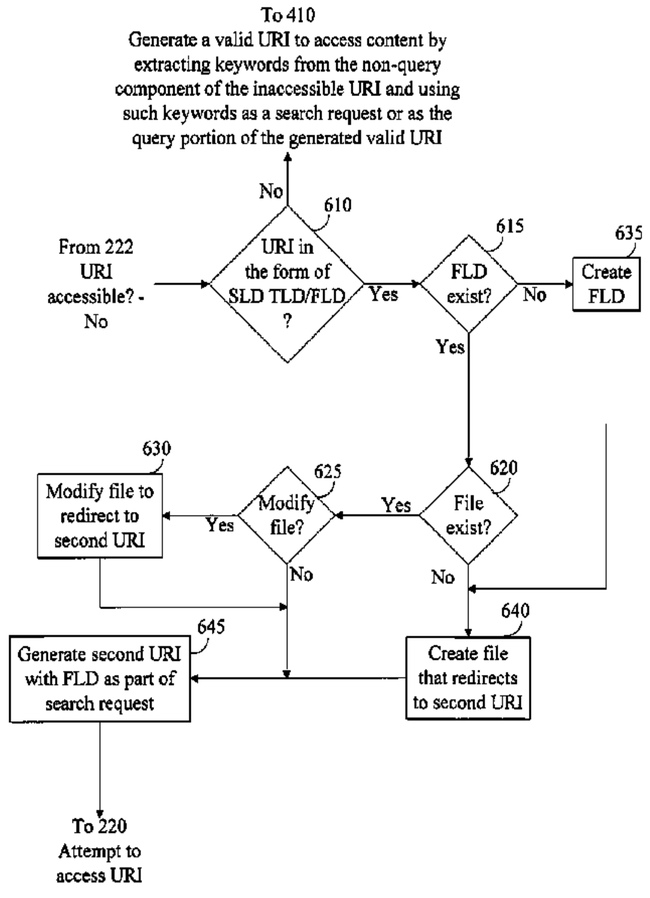
(57) **ABSTRACT**

An accessible URI may be generated in response to determining that an existing valid URI is inaccessible. When a valid URI is determined to be not accessible, then a valid URI may be generated to access content by extracting keywords from the non-query component URI (e.g., directory, domain, port, or fragment, etc.) of the inaccessible URI and using such keywords as a search request or as the query portion of the generated accessible URI.

35 Claims, 9 Drawing Sheets



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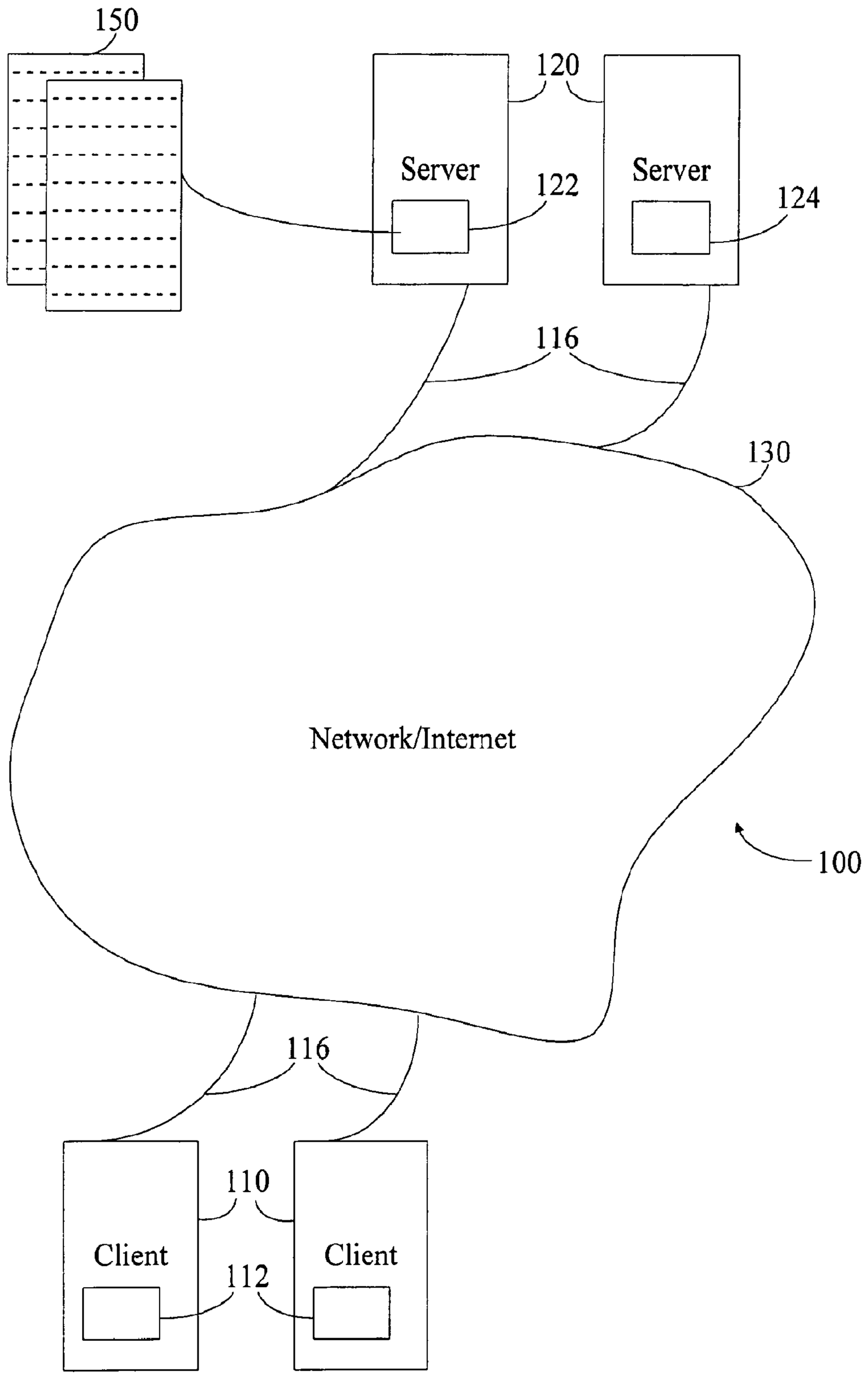

150
120
Server
122
Server
124
116
130
Network/Internet
100
116
110
Client
112
Client

Fig. 1a

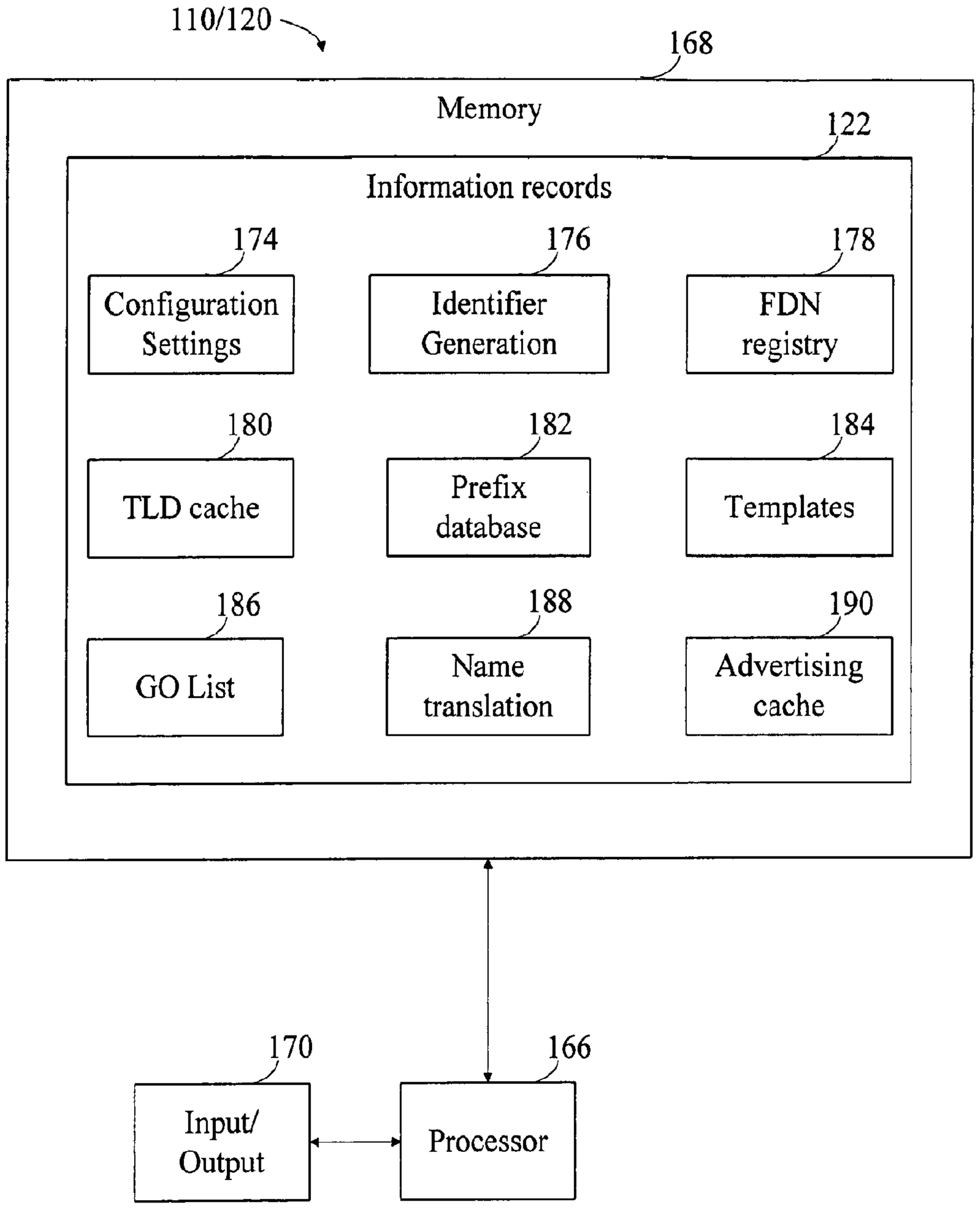
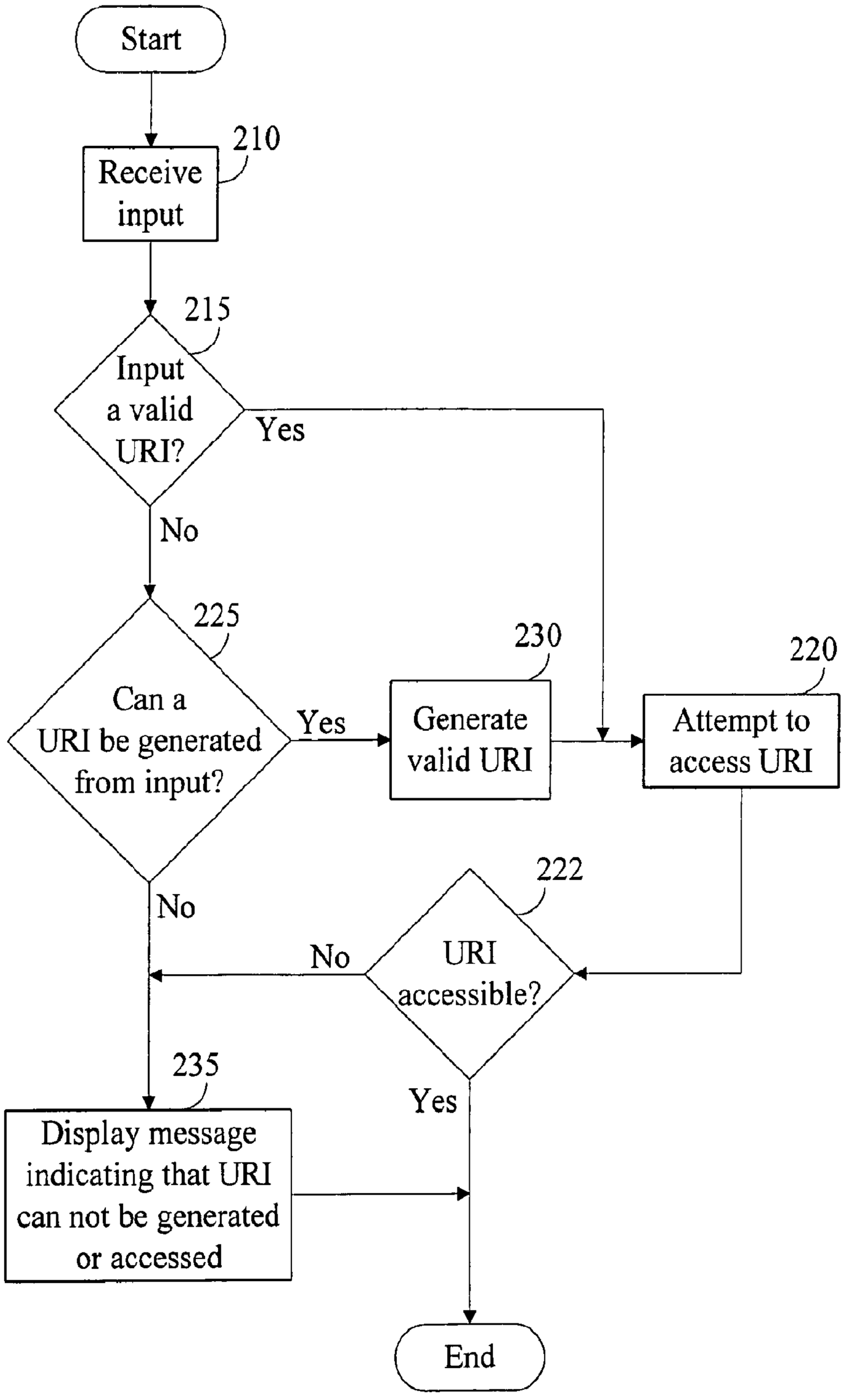

110/120
168
Memory
122
Information records
174
Configuration Settings
176
Identifier Generation
178
FDN registry
180
TLD cache
182
Prefix database
184
Templates
186
GO List
188
Name translation
190
Advertising cache
170
Input/ Output
166
Processor

Fig. 1b



Prior Art
Fig. 2

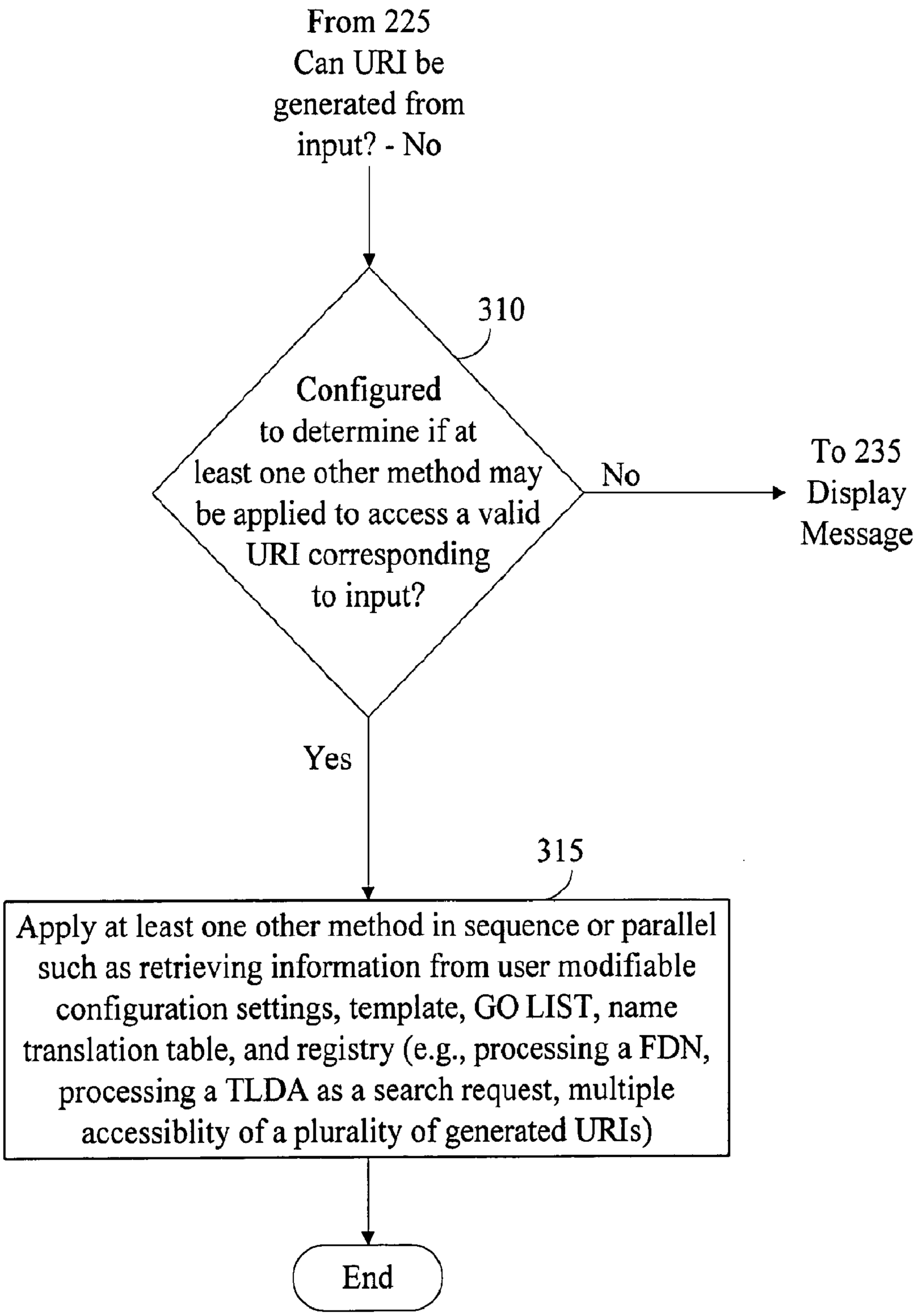

From 225
Can URI be generated from input? - No
310
Configured to determine if at least one other method may be applied to access a valid URI corresponding to input?
No
To 235 Display Message
Yes
315
Apply at least one other method in sequence or parallel such as retrieving information from user modifiable configuration settings, template, GO LIST, name translation table, and registry (e.g., processing a FDN, processing a TLDA as a search request, multiple accessiblity of a plurality of generated URIs)
End

Fig. 3

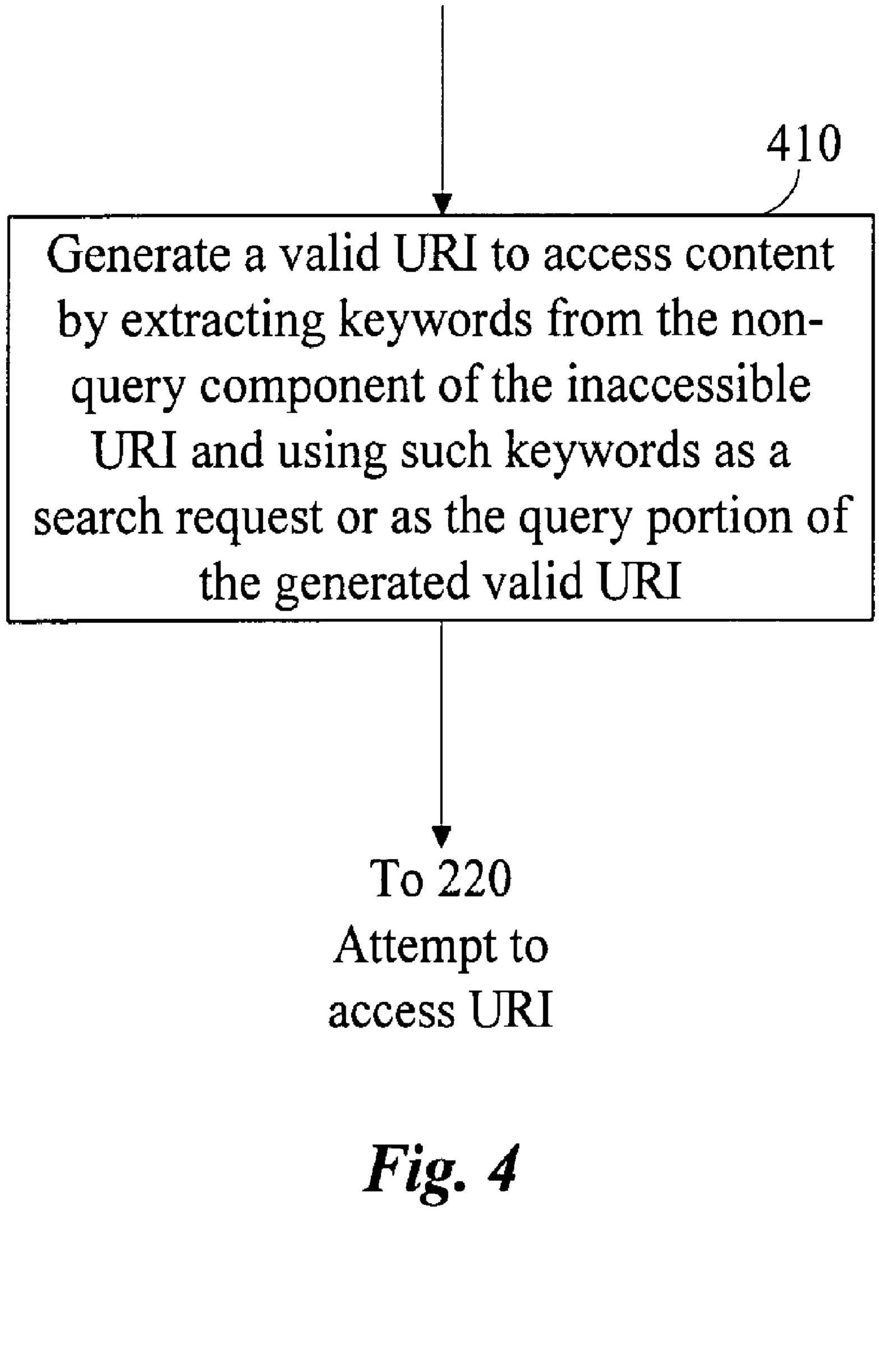

From 222
URI
accessible? - No
410
Generate a valid URI to access content by extracting keywords from the non-query component of the inaccessible URI and using such keywords as a search request or as the query portion of the generated valid URI
To 220
Attempt to
access URI

Fig. 4

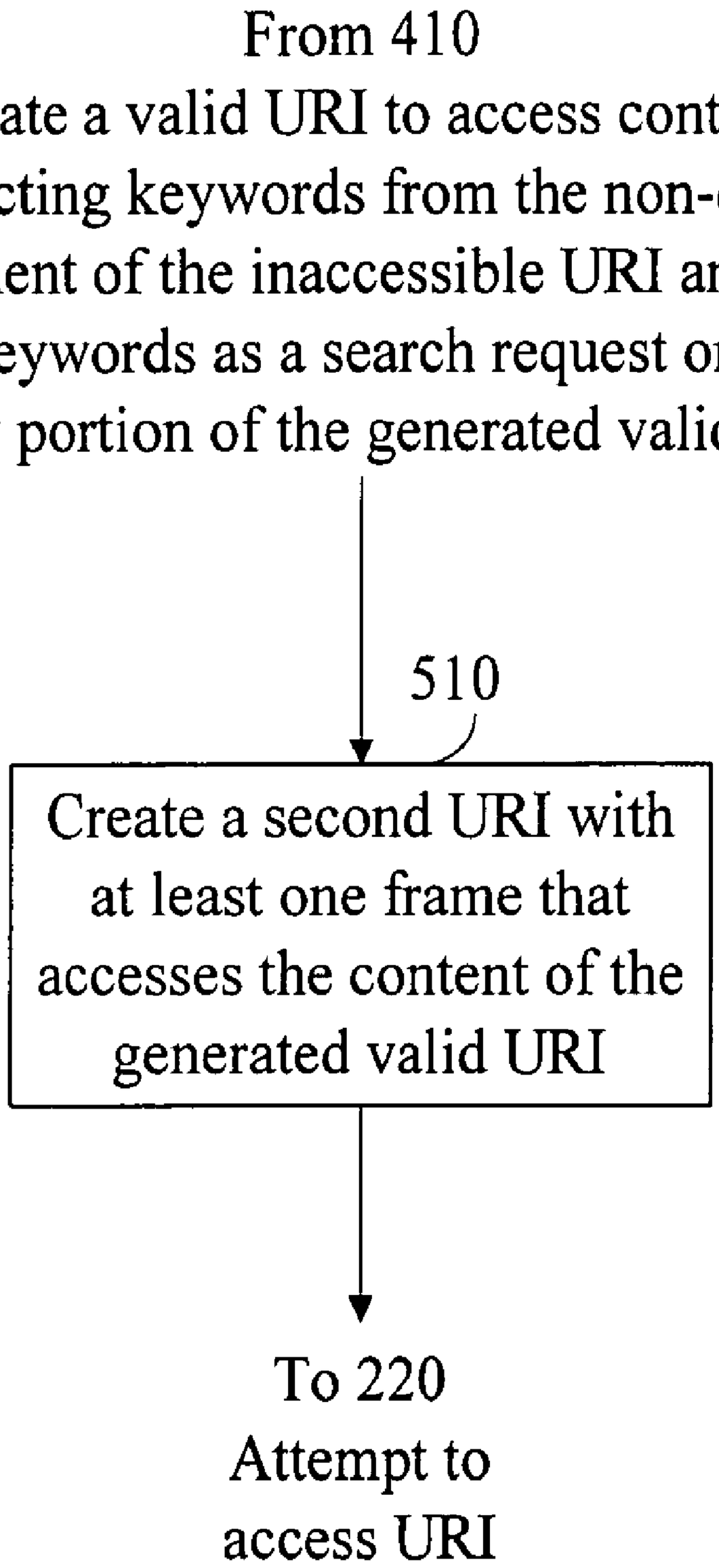

From 410
Generate a valid URI to access content by extracting keywords from the non-query component of the inaccessible URI and using such keywords as a search request or as the query portion of the generated valid URI
510
Create a second URI with at least one frame that accesses the content of the generated valid URI
To 220
Attempt to access URI

Fig. 5

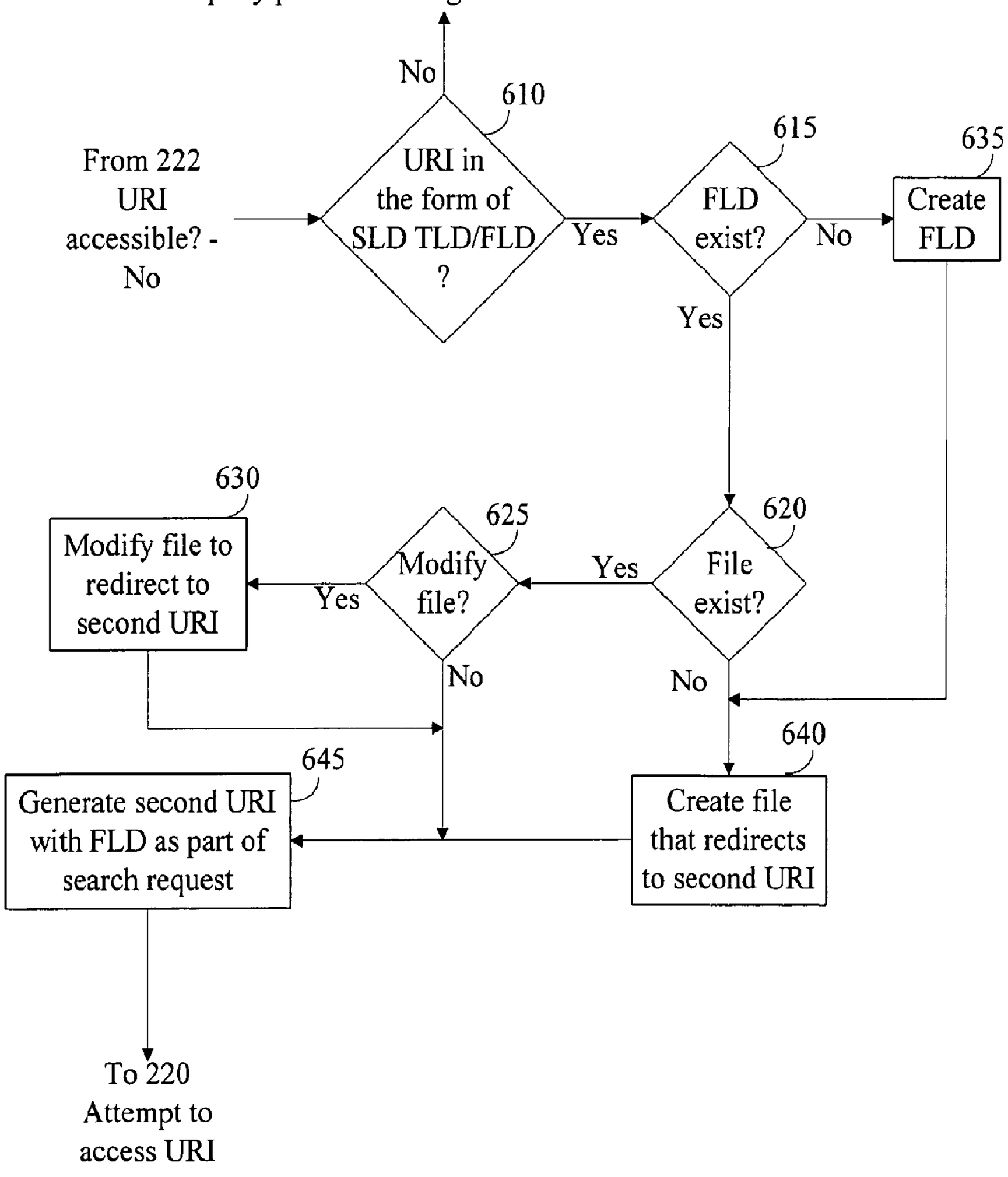

To 410
Generate a valid URI to access content by extracting keywords from the non-query component of the inaccessible URI and using such keywords as a search request or as the query portion of the generated valid URI
From 222 URI accessible? - No
610
URI in the form of SLD TLD/FLD ?
Yes
615
FLD exist?
No
635
Create FLD
Yes
620
File exist?
Yes
625
Modify file?
Yes
630
Modify file to redirect to second URI
No
No
640
Create file that redirects to second URI
645
Generate second URI with FLD as part of search request
To 220
Attempt to access URI

Fig. 6

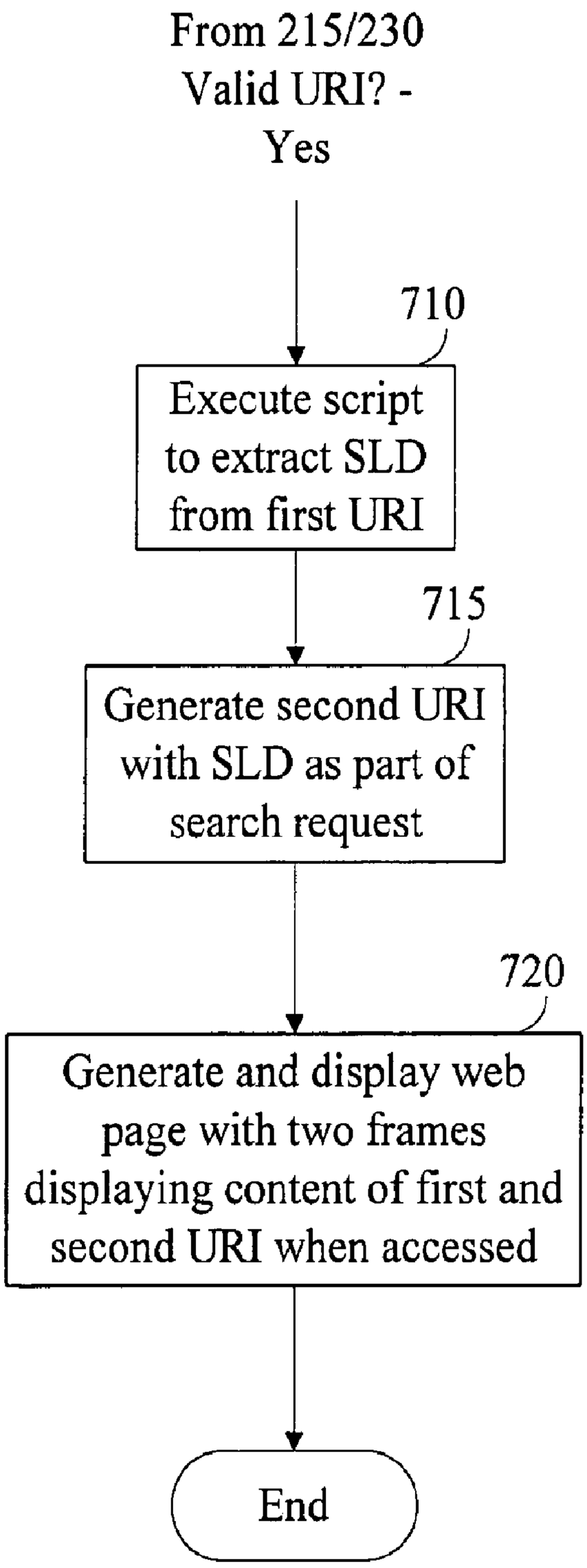

From 215/230
Valid URI? - Yes
710
Execute script to extract SLD from first URI
715
Generate second URI with SLD as part of search request
720
Generate and display web page with two frames displaying content of first and second URI when accessed
End

Fig. 7

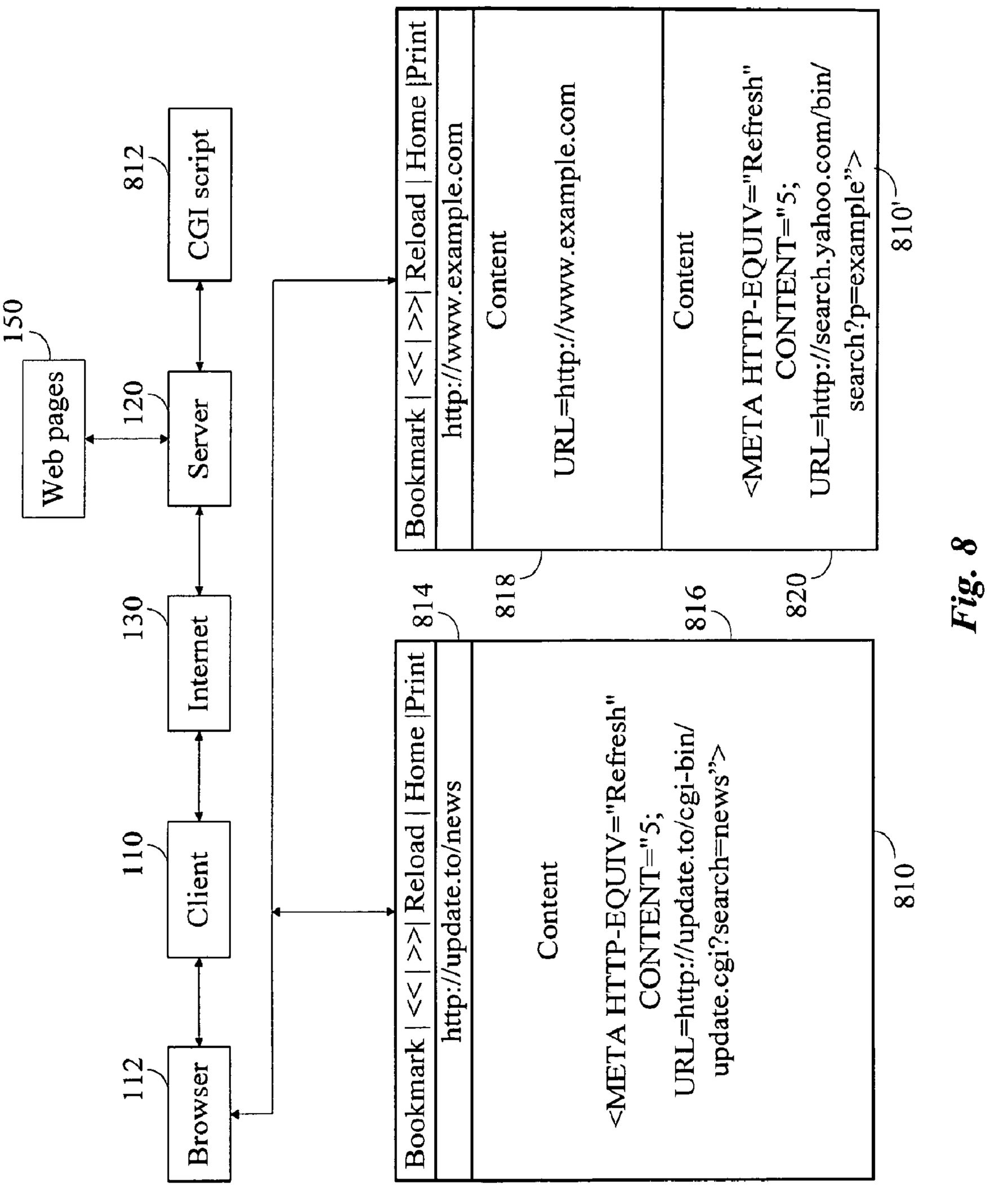

Web pages
150
Server
120
CGI script
812
Internet
130
Client
110
Browser
112
Bookmark | << | >>| Reload | Home |Print
http://www.example.com
Content
URL=http://www.example.com
818
820
816
814
<META HTTP-EQUIV="Refresh"
CONTENT="5;
URL=http://search.yahoo.com/bin/
search?p=example">
810'
http://update.to/news
update.cgi?search=news">
810

Fig. 8

SEARCH ENGINE REQUEST METHOD, PRODUCT, AND APPARATUS

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue.

OTHER APPLICATIONS

This application [claims the benefit of the following patent applications, which are hereby incorporated] *incorporates the following applications* by reference:

[1.] *this application is a continuation-in-part of* U.S. patent application Ser. No. 09/532,500 filed Mar. 21, 2000, by Schneider, entitled "Fictitious domain name method, product, and apparatus", [which claims the benefit of] *now U.S. Pat. No. 7,136,932; this application is a continuation-in-part of* U.S. patent application Ser. No. 09/525,350 filed Mar. 15, 2000, by Schneider, entitled "Method for integrating domain name registration with domain name resolution"[and], *now U.S. Pat. No. 6,338,082; this application also* claims the benefit of U.S. Provisional Application Ser. No. 60/143,859 filed Jul. 15, 1999, by Schneider entitled "Method and apparatus for generation, registration, resolution, and emulation of name space", now abandoned[,]; *this application also claims the benefit of* U.S. Provisional Application Ser. No. 60/135,751 filed May 25, 1999, by Schneider entitled "Method and system for name space resolution", now abandoned [and]; *this application also claims the benefit of* U.S. Provisional Application Ser. No. 60/125,531 filed Mar. 22, 1999, by Schneider entitled "Method and system for the emulation of name space", now abandoned[.];

[2.] *this application also claims the benefit of* U.S. Provisional Application Ser. No. 60/153,594 filed Sep. 13, 1999, by Schneider entitled "Method and apparatus for using a portion of a URI to select and display advertising[.]";

[3.] *this application also claims the benefit of* U.S. Provisional Application Ser. No. 60/152,015 filed Sep. 1, 1999, by Schneider, et al., entitled "Method and apparatus for using a portion of a URI as a search request."

FIELD OF THE INVENTION

This invention generally relates to search requests, and more specifically relates to a method and apparatus for using a non-query URI component as a search request.

BACKGROUND OF THE INVENTION

The Internet is a vast computer network consisting of many smaller networks that span the world. A network provides a distributed communicating system of computers that are interconnected by various electronic communication links and computer software protocols. Because of the Internet's distributed and open network architecture, it is possible to transfer data from one computer to any other computer worldwide. In 1991, the World-Wide-Web (WWW or Web) revolutionized the way information is managed and distributed.

The Web is based on the concept of hypertext and a transfer method known as Hypertext Transfer Protocol (HTTP) which is designed to run primarily over a Transmission Control Protocol/Internet Protocol (TCP/IP) connection that employs

a standard Internet setup. A server-computer may issue the data and a client computer displays or processes it. TCP may then convert messages into streams of packets at the source, then reassemble them back into messages at the destination. Internet Protocol (IP) handles addressing, seeing to it that packets are routed across multiple nodes and even across multiple networks with multiple standards. HTTP protocol permits client systems connected to the Internet to access independent and geographically scattered server systems also connected to the Internet.

Client side browsers, such as Netscape Navigator and/or Microsoft Internet Explorer (MSIE) provide graphical user interface (GUI) based client applications that implement the client side portion of the HTTP protocol. One format for information transfer is to create documents using Hypertext Markup Language (HTML). HTML pages are made up of standard text as well as formatting codes that indicate how the page should be displayed. The client side browser reads these codes in order to display the page. A web page may be static and requires no variables to display information or link to other predetermined web pages. A web page is dynamic when arguments are passed which are either hidden in the web page or entered from a client browser to supply the necessary inputs displayed on the web page. Common Gateway Interface (CGI) is a standard for running external programs from a web server. CGI specifies how to pass arguments to the executing program as part of the HTTP server request. Commonly, a CGI script may take the name and value arguments from an input form of a first web page which may be used as a query to access a database server and generate an HTML web page with customized data results as output that is passed back to the client browser for display.

The Web is a means of accessing information on the Internet that allows a user to "surf the web" and navigate the Internet resources intuitively, without technical knowledge. The Web dispenses with command-line utilities, which typically require a user to transmit sets of commands to communicate with an Internet server. Instead, the Web is made up of millions of interconnected web pages, or documents, which may be displayed on a computer monitor. Hosts running special servers provide the Web pages. Software that runs these Web servers is relatively simple and is available on a wide range of computer platforms including PC's.

A Uniform Resource Identifier (URI) is a compact string of characters for identifying an abstract or physical resource. URIs, is the generic set of all names and addresses that refer to objects on the Internet. URLs that refer to objects accessed with existing protocols are known as URLs. A URL is the address of a file accessible on the Internet. The URL contains the name of the protocol required to access the resource, a domain name, Fully Qualified Domain Name (FQDN), or IP address that identifies a specific computer on the Internet, and a hierarchical description of a file location on the computer. In addition, the last (optional) part of the URL may be a "?" followed by a query string having name/value pairs for parameters (e.g. "?size=small&quantity=3") or a "#" followed by a fragment identifier indicating a particular position within the specified document.

The URI "http://www.example.com:80/index.html#appendix" is the concatenation of several components where "http:" is the scheme or protocol, "//www.example.com" is the FQDN having "www" as the host of the domain name "example.com", ":80" is the port connection for the HTTP server request, "index.html" is the filename located on the server, "#appendix" is the identifier to display a fragment of the HTML file called "index". The URL "http://www.example.com" also retrieves an HTML file called "index" on

a HTTP server called "example.com". By default, when either a port or filename is omitted upon accessing a HTTP server via a URL, the client browser interprets the request by connecting via port 80, and retrieving the HTML file called "index".

A domain name consists of two parts: a host and a domain. Technically, the letters to the right of the "dot" (e.g., tut.net) are referred to as Top Level Domains (TLDs), while hosts, computers with assigned IP addresses that are listed in specific TLD registries are known as second-level domains (SLDs). For the domain name "tut.net", ".net" is the TLD, and "tut" is the SLD. Domain name space is the ordered hierarchical set of all possible domain names either in use or to be used for locating an IP address on the Internet. TLDs are known as top-level domains because they comprise the highest-order name space available on the Internet. Second-level domains, as well as third-level domains (3LDs) such as "king.tut.net", are subsidiary to TLDs in the hierarchy of the Internet's DNS.

The main use of a web browser location field is for locating URLs to access resources. Entering a URL in the location field of a web browser serves as a means to access that URL. Because the function of the location field is so critical for accessing resources, the design of such location fields have rivaled much competition and innovation between existing web browser products. Improvements to better track and organize sites of URLs that users have visited such as Bookmark folders, URL history, and the personal toolbar are all examples of functionality designed to help users navigate.

A more recent feature called Smart Browsing is integrated into Netscape Navigator that uses Internet Keywords so users can streamline the use of URLs and get fast access to web sites using the browser's location field. Any single or multiword strings typed into the browser's location field that does not include a "." are sent via HTTP to a server at "netscape.com". The keyword server pulls the string and compares it to several separate lists of keyword-URL pairs. If the keyword system finds a match, it redirects the user's browser to the URL of the keyword-URL pair. Failing a match against the lists, the user's browser is redirected to a Netscape Search page with the typed string as the search query.

U.S. Provisional Application Ser. No. 60/143,859 filed Jul. 15, 1999, by Schneider entitled "Method and apparatus for generation, registration, resolution, and emulation of name space", now abandoned, uses a domain name having a top level domain alias (TLDA) to simultaneously access and search a given resource demonstrating the combination of both resolution and search services. For instance, when input is received and processed such as "http://example.44106", steps are performed to determine that "0.44106" is not a resolvable TLD and may be processed instead as a search term. Steps may then be performed to translate input into a valid URI such as "http://example.com/weather.cgi?zip=44106". When the URI is accessed, a CGI script called "weather" is executed passing the value "44106" for the name "zip", which in this case represents a zip code. By so doing a fictitious name is used to simultaneously access both a resource and search request.

This clearly demonstrates the need for methods of encouraging the creative use of URIs to access resources. Accordingly, in light of the above, there is a strong need in the art for a system and method to improve how resources and content may be accessed.

SUMMARY OF THE INVENTION

Briefly, the present invention allows URI components to be used as a search term in a query or search request. The invention allows for the non-query portion of a first URI to be used in the query portion of a second URI to generate dynamic content. The present invention allows for a shorter URI to be created on the fly in real-time that accesses content of a longer URI. The invention allows the user to combine Boolean logic with valid URI notation to generate a search request from the URI or vice-versa.

In general, in accordance with the present invention a method for locating a network resource from a first identifier includes the steps of determining whether the first identifier is accessible, accessing the first identifier in response to determining that the first identifier is accessible, generating a second identifier in response to determining that the first identifier is not accessible, wherein said second identifier is generated by retrieving information from one of a user modifiable configuration settings, template, GO LIST, name translation table, and registry, and accessing said second identifier in response to generating said second identifier.

In accordance with another aspect of the present invention a method for locating a network resource from a first identifier having a valid accessible first URI includes the steps of parsing at least one non-query URI component from the first URI, generating a valid accessible second URI having a query component that corresponds to the first URI, and simultaneously accessing both the first URI and said second URI.

In accordance with yet another aspect of the present invention a method for locating a network resource from a first identifier having a valid first URI includes the steps of determining whether the first URI is accessible, accessing the first URI in response to determining that the first URI is accessible, parsing at least one non-query URI component from the first URI in response to determining that the first URI is not accessible, generating a valid second URI having a query component that corresponds to the first URI, and accessing said second URI.

In accordance with yet additional aspects of the present invention, an apparatus which implements substantially the same functionality in substantially the same manner as the methods described above is provided.

In accordance with other additional aspects of the present invention, a computer-readable medium that includes computer-executable instructions may be used to perform substantially the same methods as those described above is provided.

The foregoing and other features of the invention are hereinafter fully described and particularly pointed out in the claims. The following description and the annexed drawings set forth in detail one or more illustrative aspects of the invention, such being indicative, however, of but one or a few of the various ways in which the principles of the invention may be employed.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1**a is a block diagram of an exemplary distributed computer system in accordance with the present invention.

FIG. **1**b is a block diagram illustrating exemplary information records stored in memory in accordance with the present invention.

FIG. **2** is a flowchart illustrating the steps performed by a prior art system for accessing a URI.

FIG. **3** is a flowchart illustrating the steps performed for generating a valid URI in accordance with the present invention.

FIG. **4** is a flowchart illustrating the steps performed for generating a valid URI in response to determining that an existing valid URI is inaccessible in accordance with the present invention.

FIG. **5** is a flowchart illustrating the steps performed for generating a frame having an accessible URI in accordance with the present invention.

FIG. **6** is a flowchart illustrating the steps performed for creating files or directories as needed to form an accessible URI in accordance with the present invention.

FIG. **7** is a flowchart illustrating the steps performed for extracting a domain to be used as a search request in accordance with the present invention.

FIG. **8** is a diagram depicting how results may be displayed in a web browser in accordance with the present invention.

DETAILED DESCRIPTION OF THE INVENTION

The present invention will now be described with reference to the drawings, wherein like reference numerals are used to refer to like elements throughout.

Turning first to the nomenclature of the specification, the detailed description that follows represents processes and symbolic representations of operations by conventional computer components, including a local processing unit, memory storage devices for the local processing unit, display devices, and input devices. Furthermore, these processes and operations may utilize conventional computer components in a heterogeneous distributed computing environment, including remote file servers, computer servers, and memory storage devices. These distributed computing components may be accessible to the local processing unit by a communication network.

The processes and operations performed by the computer include the manipulation of data bits by a local processing unit and/or remote server and the maintenance of these bits within data structures resident in one or more of the local or remote memory storage devices. These data structures impose a physical organization upon the collection of data bits stored within a memory storage device and represent electromagnetic spectrum elements.

A process may generally be defined as being a sequence of computer-executed steps leading to a desired result. These steps generally require physical manipulations of physical quantities. Usually, though not necessarily, these quantities may take the form of electrical, magnetic, or optical signals capable of being stored, transferred, combined, compared, or otherwise manipulated. It is conventional for those skilled in the art to refer to these signals as bits or bytes (when they have binary logic levels), pixel values, works, values, elements, symbols, characters, terms, numbers, points, records, objects, images, files, directories, subdirectories, or the like. It should be kept in mind, however, that these and similar terms should be associated with appropriate physical quantities for computer operations, and that these terms are merely conventional labels applied to physical quantities that exist within and during operation of the computer.

It should also be understood that manipulations within the computer are often referred to in terms such as adding, comparing, moving, positioning, placing, illuminating, removing, altering, etc., which are often associated with manual operations performed by a human operator. The operations described herein are machine operations performed in conjunction with various input provided by a human operator or user that interacts with the computer. The machines used for performing the operation of the present invention include local or remote general-purpose digital computers or other similar computing devices.

In addition, it should be understood that the programs, processes, methods, etc. described herein are not related or limited to any particular computer or apparatus nor are they related or limited to any particular communication network architecture. Rather, various types of general-purpose machines may be used with program modules constructed in accordance with the teachings described herein. Similarly, it may prove advantageous to construct a specialized apparatus to perform the method steps described herein by way of dedicated computer systems in a specific network architecture with hard-wired logic or programs stored in nonvolatile memory, such as read only memory.

FIG. **1**a illustrates an exemplary system for providing a distributed computer system **100** in accordance with one aspect of the present invention and may include client computers or any network access apparatus **110** connected to server computers **120** via a network **130**. The network **130** may use Internet communications protocols (IP) to allow clients **110** to communicate with servers **120**. The network access apparatus **110** may include a modem or like transceiver to communicate with the electronic network **130**. The modem may communicate with the electronic network **130** via a line **116** such as a telephone line, an ISDN line, a coaxial line, a cable television line, a fiber optic line, or a computer network line. Alternatively, the modem may wirelessly communicate with the electronic network **130**. The electronic network **130** may provide an on-line service, an Internet service provider, a local area network service, a wide area network service, a cable television service, a wireless data service, an intranet, a satellite service, or the like.

The client computers **110** may be any network access apparatus including hand held devices, palmtop computers, personal digital assistants (PDAs), notebook, laptop, portable computers, desktop PCs, workstations, and/or larger/smaller computer systems. It is noted that the network access apparatus **110** may have a variety of forms, including but not limited to, a general purpose computer, a network computer, an internet television, a set top box, a web-enabled telephone, an internet appliance, a portable wireless device, a game player, a video recorder, and/or an audio component, for example.

Each client **110** typically includes one or more processors **166**, memories **168**, and input/output devices **170**. An input device may be any suitable device for the user to give input to client computer system **110**, for example: a keyboard, a 10-key pad, a telephone key pad, a light pen or any pen pointing device, a touchscreen, a button, a dial, a joystick, a steering wheel, a foot pedal, a mouse, a trackball, an optical or magnetic recognition unit such as a bar code or magnetic swipe reader, a voice or speech recognition unit, a remote control attached via cable or wireless link to a game set, television, and/or cable box. A data glove, an eye-tracking device, or any MIDI device may also be used. A display device may be any suitable output device, such as a display screen, text-to-speech converter, printer, plotter, fax, television set, or audio player. Although the input device is typically separate from the display device, they may be combined; for example: a display with an integrated touchscreen, a display with an integrated keyboard, or a speech-recognition unit combined with a text-to-speech converter.

The servers **120** may be similarly configured. However, in many instances server sites **120** include many computers, perhaps connected by a separate private network. In fact, the network **130** may include hundreds of thousands of individual

networks of computers. Although client computers **110** are shown separate from the server computers **120**, it is understood that a single computer might perform the client and server roles. Those skilled in the art will appreciate that the computer environment **100** shown in FIG. **1**a is intended to be merely illustrative. The present invention may also be practiced in other computing environments. For example, the present invention may be practiced in multiple processor environments wherein the client computer includes multiple processors. Moreover, the client computer need not include all of the input/output devices as discussed above and may also include additional devices. Those skilled in the art will appreciate that the present invention may also be practiced via Intranets and more generally in distributed environments in which a client computer requests resources from a server computer.

During operation of the distributed system **100**, users of the clients **110** may desire to access information records **122** stored by the servers **120** while utilizing, for example, the Web. Furthermore, such server systems **120** may also include one or more search engines having one or more databases **124**. The records of information **122** may be in the form of Web pages **150**. The pages **150** may be data records including as content plain textual information, or more complex digitally encoded multimedia content, such as software programs, graphics, audio signals, videos, and so forth. It should be understood that although this description focuses on locating information on the World-Wide-Web, the system may also be used for locating information via other wide or local area networks (WANs and LANs), or information stored in a single computer using other communications protocols.

The clients **110** may execute Web browser programs **112**, such as Netscape Navigator or MSIE to locate the pages or records **150**. The browser programs **112** enable users to enter addresses of specific Web pages **150** to be retrieved. Typically, the address of a Web page is specified as a URI or more specifically as a URL. In addition, when a page has been retrieved, the browser programs **112** may provide access to other pages or records by "clicking" on hyperlinks (or links) to previously retrieved Web pages. Such links may provide an automated way to enter the URL of another page, and to retrieve that page.

FIG. **1**b illustrates a block diagram of a processor **166** coupled to a storage device such as memory **168** and to input/output devices **170** in a client **110** and/or server **120** computing system. Stored in memory **168** may be information records **122** having any combination of exemplary content such as lists, files, and databases. Such records may include for example: user modifiable configuration settings **174**, identifier generation routines **176**, FDN registry **178**, TLD cache **180**, prefix database **182**, Templates **184**, GO List **186**, name translation table **188**, and advertising cache **190**. These information records may be further introduced and discussed in more detail throughout the disclosure of this invention.

FIG. **2** is a flowchart illustrating the steps performed by a prior art system for locating a network resource from an identifier by accessing a URI. A device such as a network access apparatus **110**, servlet, applet, stand-alone executable program, or user interface element such as a text box object, command line, speech to text interface, location field **814** of a web browser **112**, may receive and parse input such as text or voice in step **210**. It then may be determined in step **215** whether the input **210** is a URI. If the input is a URI, then an attempt may be made in step **220** to access the URI. The URI may be accessed when it is determined in step **222** that the URI is accessible. If the input is not a URI, then it may be determined in step **225** whether a URI can be generated from the input (e.g., if a scheme is missing the prefix "http://" or another scheme prefix may be concatenated to input). If so, then a URI is generated **230** and an attempt may be made in step **220** to access the URI. If the URI can not be generated or accessed, then a message indicating that the URI can not be generated or accessed may be displayed in step **235**.

FIG. **3** is a flowchart illustrating the steps performed for generating a valid URI. When it is determined in step **225** that a URI can not be generated from the input **210** in accordance with methods known to one of ordinary skill in the art, then it may be determined in step **310** whether it is configured to determine whether other methods may be applied to access a valid URI corresponding to input. If configuration **174** is not enabled, then a message indicating that the URI can not be generated may be displayed in step **235**. However, when configuration is enabled, then at least one other method may be applied in step **315** in sequence or parallel including methods explained in U.S. patent application Ser. No. 09/532,500 filed Mar. 21, 2000, by Schneider, entitled "Fictitious domain name method, product, and apparatus" such as retrieving information from user modifiable configuration settings **174**, template **184**, GO LIST **186**, name translation table **188**, and registry **178** (e.g., processing a FDN, processing a TLDA as a search request, and multiple accessibility from a plurality of generated URIs, etc.).

FIG. **4** is a flowchart illustrating the steps performed for generating a valid URI in response to determining that an existing valid URI is inaccessible. When a valid URI is determined in step **222** to be not accessible, then a valid URI may be generated in step **410** to access content by extracting keywords from the non-query component URI (e.g., directory, domain, port, or fragment, etc.) of the inaccessible URI and using such keywords as a search request or as the query portion of the generated valid URI. After valid URI generation in step **410** an attempt may be made in step **220** to access the URI.

In effect, the non-query portion of a first URI may be used in the query portion of a second URI to generate dynamic content. Validity of URI syntax is explained in T. Berners-Lee, "Informational RFC (Request for Comment) **1630**: Universal Resource Identifiers in WWW—A Unifying Syntax for the Expression of Names and Addresses of Objects on the Network as used in the World-Wide Web", Internet Engineering Task Force (IETF), June 1994, "http://www.faqs.org/rfcs/rfc1630.html", which is herein incorporated by reference.

Typically, when a HTTP request is submitted to access a URI that does not exist, an error **404** code is returned from the requested web server, and in turn, a script may be executed to redirect and display a gen-eric web page informing the user of the error **404** code. A modification may be made to the script to generate an accessible URI by creating the appropriate directories or files on the web server in response to an error **404** code (or any other applicable error code from the 300 series, 400 series, or 500 series) such that when the HTTP request is resubmitted the URI exists and is accessible.

FIG. **5** is a flowchart illustrating the steps performed for generating a frame having an accessible URI. After valid URI generation in step **410**, a script may be executed in step **510** to create a second accessible URI by adding the appropriate directories and files. The content of the newly created file may include at least one frame that displays the content of the valid generated URI. After the second accessible URI is created, an attempt may be made in step **220** to access the second URI.

FIG. **6** is a flowchart illustrating the steps performed for creating files or directories as needed to form an accessible URI. When it is determined in step **222** that a valid URI is not

accessible it may then be further determined in step **610** whether the URI has the minimum form of "scheme://SLD.TLD/FLD" where the domain name is "SLD.TLD" and the path is "/FLD", which in this case represents a first level directory (FLD). If the URI is not of the minimum form then steps (such as **410** and/or **510**) may be performed. When it is determined in step **610** that the URI is of the minimum form, then it may be determined in step **615** whether the FLD exists. If the FLD exists, then it may be further determined in step **620** whether a file exists within the FLD. If a file exists, then it may be determined in step **625** whether the content of the file requires modification (e.g., META tag for purpose of URI redirection). If modification is needed then the content of the file may be modified in step **630** as necessary. If the FLD does not exist, then a FLD may be created in step **635**. When the FLD is created or when the FLD exists but a file within the FLD does not exist, then a file within the FLD may be created in step **640**. When it is determined in step **620** that the file already exists and does not need modification in step **625** or the file is created in step **640** or the existing file is modified in step **635** then a second URI may be generated in step **645** including the FLD as part of a search request. After the accessible URI is created, an attempt may be made in step **220** to access the URI.

For example, a device receives the input "http://update.to/news". When it is determined that the input is a valid URL (URL is a subset of a URI), a HTTP GET request is submitted to retrieve its content. A "404 error code" is received in response to the request indicating that no such URL exists. As practiced by those skilled in the art, the "404 error code" is commonly redirected to display a gen-eric informative page alerting the user that no such URL exists. Advantage may be taken by modifying the redirect script.

The modified script may be executed upon the "404 error code" and determines that a "/news" directory does not exist and is created. Furthermore, an "index.htm" is created in the "news" directory serving as a default file for the URL listed above. The content of the file includes a <META> tag which may be used to redirect the URL to another URL such as "http://update.to/cgi-bin/update.cgi?search=news" which serves as a dynamic output.

For instance, the input "update.to/news" becomes equivalent to "http://update.to/news/index.htm" and includes within the "index.htm" file the following <META> tag:

<META HTTP-EQUIV=Refresh CONTENT="5; URL=http://update.to/cgi-bin/update.cgi?search=news">

which communicates to a device that interprets HTML to load the URL "hftp://update.to/cgi-bin/update.cgi?search=news" 5 seconds after the current document "http://update.to/news/index.htm" has finished loading. Advertising may be displayed by selecting an ad from an advertising cache **190** that corresponds to any URI components or the like before automatic URI redirection. Advertisement selection is explained in U.S. Provisional Application Ser. No. 60/153,594 filed Sep. 13, 1999, by Schneider entitled "Method and apparatus for using a portion of a URI to select and display advertising." In another example, the content of the file may include a <FRAME> tag, which may be used to access content from "http://update.to/cgi-bin/update.cgi?search=news".

In effect, shorter URLs may be generated in real time or on-the-fly when necessary and used as a substitute or proxy for longer URLs. Though any filename may be used, it is a preferred aspect to use "index.htm" as a frame or redirect so the proxy URL is even shorter in string length. A shorter URL makes it easier for a user to remember the URL for future use. The invention is not limited to using only a FLD as a search request. Any directory or combination of directory levels may be either generated on the fly or used as a search request. In addition to using the directory portion of a URI as a search request, a domain (e.g., SLD) or any combination of domain levels may in turn be used to generate a query as well. For example, a subdomain may be generated to create the FQDN "news.update.to" having the minimum form of "scheme://3LD.SLD.TLD", which may be used to access content from "http://update.to/cgi-bin/update.cgi?search=news".

Analysis from major online search engines show that more than 90% of all search requests include three keywords or less. For instance, the search request "coffee and cream and sugar" can yield "http://example.com/coffee/cream/sugar/index.htm". In turn, the input "example.com/coffee/cream/sugar" can generate search results thereby combining the step of searching by entering in a web address or URI to search. Boolean logic can be applied to extend variations for simple search requests. For example, the search request "coffee or cream or sugar" yields "http://example.com/coffee.cream.sugar/index.htm" whereas the search request "coffee or cream and sugar" yields "http://example.com/coffee.cream/sugar/index.htm". In effect, URI notation can be used a system to generate a Boolean search request from the URI or vice-versa.

FIG. **7** is a flowchart illustrating the steps performed for extracting a domain to be used as a search request. When the input **210** is a valid **215** URI or a valid URI is generated in step **230** and the configuration settings **174** indicate that domain identifier extraction may be used (e.g., SLD) then a script may be executed to extract in step **710** the SLD from the valid URI (**215**, **230**) and a second URI may be generated in step **715** by using the SLD as part of a search request. The script generates a web page having two frames. The first frame links to the valid URI and the second frame links to the second URI which displays content when accessed relating to the use of SLD as a keyword in a search request.

FIG. **8** is a diagram depicting how results may be displayed in a web browser. A client **110** web browser **112** having a web page **810** is used to connect to a server **120** via the Internet **130** that runs a CGI script **812**. The location field of the web browser **112** is suppressed and the web page **810** displays at least two frames. The first frame is the web based location field **814** and the second frame **816** is used to display the contents **150** of a web address. An input device (e.g., keyboard, mouse, pen light, touch screen, or microphone, etc.) of a client computer or network access apparatus **110** is used to receive a web address as input either directly from a hyperlink (not shown) in the web page **810**, or from the location field **814** of the web page **810**. A URL GET request is generated from the input and the browser **112** forwards the request to a server **120**, which processes the request by executing a CGI script **812** to determine accessibility **204**. An accessible URI **206** may be generated and the requested page **150** is sent to the browser **112**. The content **150** of the URI may be displayed (as discussed in FIG. **6** with a specific example) in the second frame **816** of the web page **810**. The location field **814** of the first frame may either persist by displaying the input or is cleared out for entry of another web address.

Another web page **810'** (as discussed in FIG. **7**) having a location field that is not suppressed may be displayed by using a different CGI script **812**. A URL GET request may be generated from the input and the browser **112** forwards the request to a server **120**, which processes the request by executing a CGI script **812** to determine accessibility. An accessible URI may be generated and the requested page **150** is sent to the browser **112**. The content **150** of the URI may be displayed in a first frame **818** of the web page **810'** whereas the content of the second frame **820** may be dynamically generated by corresponding the extracted SLD from the URI as a search term in a second URI. By using the steps illustrated in FIG. **7**, when a first URI "http://www.example.com" is

received as input, a script extracts "example" from the URI and generates a second URI "http://search.yahoo.com/bin/search?p=example". Both the first URI and second URI are generated as frames and displayed as a web page **810'**.

Though the above aspects demonstrate how URIs may be accessed based upon a web-based version of a location field, similar teachings may be applied to those skilled in the art by providing a user interface element such as a text box object as input. The text box object may be located anywhere and on any web page including a text box that may be embedded or displayed as part of an on-line advertisement. The text box object may be used in a stand-alone application or stored on magnetic and/or optical media that may be non-volatile, writable, removable, or portable. The text box object may be incorporated as an applet or servlet and embedded in other applications. The text box may be integrated in the task bar or any part of the GUI's OS, or the OS bypassed and a user interface element overlaid as a graphic on a display device based on modifications to a video card and/or it's associated firmware or software drivers. A command line text box may be further overlaid as an interactive object in other embodiments such as Internet television, cable television, digital television, or interactive television through an Internet appliance or set top box.

Those skilled in the art may make and use software program that functions as a browser plug-in. Such a program may be downloaded and installed for integration into the command line of a device or location field **154** of a browser program **112**. Modifying the source code of the browser program **112** itself may be more desirable, in effect, enabling tens of millions of users to take advantage of more creative ways to use input as a means to access a valid URI.

Although the invention has been shown and described with respect to a certain preferred aspect or aspects, it is obvious that equivalent alterations and modifications will occur to others skilled in the art upon the reading and understanding of this specification and the annexed drawings. In particular regard to the various functions performed by the above described items referred to by numerals (components, assemblies, devices, compositions, etc.), the terms (including a reference to a "means") used to describe such items are intended to correspond, unless otherwise indicated, to any item which performs the specified function of the described item (e.g., that is functionally equivalent), even though not structurally equivalent to the disclosed structure which performs the function in the herein illustrated exemplary aspect or aspects of the invention. In addition, while a particular feature of the invention may have been described above with respect to only one of several illustrated aspects, such feature may be combined with one or more other features of the other aspects, as may be desired and advantageous for any given or particular application.

The description herein with reference to the figures will be understood to describe the present invention in sufficient detail to enable one skilled in the art to utilize the present invention in a variety of applications and devices. It will be readily apparent that various changes and modifications could be made therein without departing from the spirit and scope of the invention as defined in the following claims.

What is claimed is:

1. A method for generating newly created information comprising:

a user intentionally submitting a request to locate a file that does not exist on a server, said request including a Uniform Resource Identifier (URI) having at least one of a scheme, one or more domains, port, path, one or more directory names, and one or more file names;

receiving, at said server, said request to locate said file from said server;

determining that said file can not be located on said server;

extracting at least one keyword from said at least one of a scheme, one or more domains, port, path, one or more directory names, and one or more **[**tile**]** *file* names;

generating and performing a search request having said at least one keyword to at least one Internet search engine provider to obtain at least one web page including said at least one keyword; and,

dynamically generating and providing said newly created information to said user wherein said newly created information includes results of said search request from said Internet search engine provider.

2. The method, as set forth in claim **1**, wherein said URI can be represented as "scheme://SLD.TLD/FLD/index.htm" whereby SLD.TLD is a domain name, FLD is a first level directory path, and index.htm is a default file.

3. The method, as set forth in claim **2**, further including creating said FLD and said default file when it is determined that said file can not be located on said server.

4. The method, as set forth in claim **3**, wherein said default file is capable of dynamically providing said newly created information to said user.

5. The method, as set forth in claim **1**, wherein said URI can be represented as "scheme://3LD.SLD.TLD/index.htm" whereby SLD.TLD is a domain name, 3LD is a subdomain of said domain name, and index.htm is a default file.

6. The method, as set forth in claim **5**, further including creating said 3LD and said default file when it is determined that said file can not be located on said server.

7. The method, as set forth in claim **6**, wherein said default file is capable of dynamically generating said newly created information to said user.

8. The method, as set forth in claim **1**, wherein said search request includes **[**boolean**]** *Boolean* logic translated from said path of said URI.

9. The method, as set forth in claim **1**, further including providing at least one advertisement corresponding to said at least one keyword before dynamically generating said newly created information to said user.

10. A method for presenting information, the method comprising:

receiving a user request at a computing device, the user request comprising a Uniform Resource Identifier (URI) comprising at least one of a scheme, one or more domains, port, path, one or more directory names, or one or more file names;

determining whether the user request corresponds to a valid existing resource available from the computing device;

the computing device extracting at least one keyword from the at least one of a scheme, one or more domains, port, path, one or more directory names, or one or more file names in response to determining the user request does not correspond to a valid existing resource;

the computing device generating a search request based on at least the at least one keyword to obtain an identification of at least one resource corresponding to the at least one keyword; and

the computing device communicating the identification of the at least one resource corresponding to the at least one keyword.

11. The method according to claim 10, wherein generating a search request comprises generating a search request to an Internet search engine, and wherein communicating the identification of the at least one resource comprises communicating over the Internet.

12. The method according to claim 10, wherein the URI comprises a representation comprising "HLD.TLD/DP" whereby HLD.TLD is a domain name comprising a top level

domain (TLD) and at least one hierarchal second or higher level domain name (HLD), and DP is a directory path.

13. The method according to claim 12, further comprising creating the DP and a resource corresponding to the URI in response to the URI not corresponding to a valid existing resource.

14. The method according to claim 13, wherein the resource is adapted to dynamically provide newly created information.

15. The method according to claim 10, wherein the URI comprises a representation comprising "3LD.SLD.TLD" whereby SLD.TLD is a domain name comprising a top level domain name (TLD) and a second level domain name (SLD), and 3LD is a subdomain of the second level domain name.

16. The method according to claim 15, further comprising creating the 3LD and a resource in response to the URI not corresponding to a valid existing resource.

17. The method according to claim 16, wherein the resource is capable of dynamically generating newly created information.

18. The method according to claim 10, wherein the query comprises Boolean logic translated from a path of the URI.

19. The method according to claim 10, further comprising providing information relating to at least one advertisement relating to the at least one keyword.

20. A non-transitory tangible computer readable medium having instructions stored thereon, the instructions comprising:

instructions for receiving a user request to locate a file, the user request including a Uniform Resource Identifier (URI) having at least one of a scheme, one or more domains, port, path, one or more directory names, or one or more file names;

instructions for determining that the file cannot be located on a server;

instructions for extracting at least one keyword from the at least one of a scheme, one or more domains, port, path, one or more directory names, or one or more file names;

instructions for generating a search request having the at least one keyword to obtain at least one web page; and,

instructions for dynamically generating and providing newly created information wherein the newly created information comprises, at least in part, information that leads to the at least one web page.

21. A non-transitory tangible computer readable medium having instructions stored thereon that cause a computing device to perform operations comprising:

determining whether a user request comprising a Uniform Resource Identifier (URI) comprising at least one of a scheme, domain, port, path, directory name, or file name corresponds to an existing resource;

extracting at least one keyword from the at least one of a scheme, domain, port, path, directory name, or file name in response to determining that the user request does not correspond to an existing resource;

generating a query based on at least the at least one keyword to obtain an identification of at least one resource corresponding to the at least one keyword; and

communicating the identification of the at least one resource corresponding to the at least one keyword.

22. The non-transitory tangible computer readable medium according to claim 21, wherein generating a query comprises generating a search request to an Internet search engine and communicating the identification of the at least one resource comprises communicating via the Internet.

23. The non-transitory tangible computer readable medium according to claim 21, wherein the URI comprises a representation comprising "HLD.TLD/DP" whereby HLD.TLD is a domain name comprising a top level domain (TLD) and at least one hierarchal second or higher level domain name (HLD), and DP is a directory path.

24. The non-transitory tangible computer readable medium according to claim 23 having instructions stored thereon that cause the computing device to perform operations further comprising:

creating the DP and a resource corresponding to the URI in response to determining that the URI does not correspond to an existing resource.

25. The non-transitory tangible computer readable medium according to claim 21 having instructions stored thereon that cause the computing device to perform operations further comprising:

providing information relating to at least one advertisement relating to the at least one keyword.

26. A system, comprising:

at least one interface adapted to receive a user request, the user request comprising a Uniform Resource Identifier (URI) comprising at least one of a scheme, domain, port, path, directory name, or file name; and

at least one computing device adapted to:

determine whether the user request corresponds to an available resource;

extract at least one keyword from the at least one of a scheme, domain, port, path, directory name, or file name in response to determining that the request does not correspond to an available resource;

generate a query based on at least the at least one keyword to obtain an identification of at least one resource corresponding to the at least one keyword; and

communicate through the at least one interface, at least one of the query or the identification of the at least one resource corresponding to the at least one keyword.

27. The system according to claim 26, wherein generating a query comprises generating a search request to an Internet search engine, and communicating at least one of the query or the identification of the at least one resource comprises communicating over the Internet.

28. The system according to claim 26, wherein the URI comprises a representation comprising "HLD.TLD/DP" whereby HLD.TLD is a domain name comprising a top level domain (TLD) and at least one hierarchal second or higher level domain name (HLD), and DP is a directory path.

29. The system according to claim 26, wherein the computing device is further adapted to create the DP and a new resource corresponding to the URI in response to the computing device determining that the URI does not correspond to an available resource.

30. The system according to claim 29, wherein the computing device is adapted to create the new resource to be adapted to dynamically provide newly created information.

31. The system according to claim 26, wherein the URI comprises a representation comprising "3LD.SLD.TLD" whereby SLD.TLD is a domain name comprising a top level domain name (TLD) and a second level domain name (SLD), and 3LD is a subdomain of the second level domain name.

32. The system according to claim 31, wherein the computing device is adapted to create the 3LD and a default resource in response to the computing device determining that the URI does not correspond to an available resource.

33. The system according to claim 32, wherein the computing device is adapted to create the default resource to be adapted to dynamically generate newly created information.

34. The system according to claim 26, wherein the computing device is adapted to generate the query comprising Boolean logic translated from a path of the URI.

35. The system according to claim 26, wherein the computing device is further adapted to:

provide information relating to at least one advertisement relating to the at least one keyword.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : RE43,690 E
APPLICATION NO. : 12/044804
DATED : September 25, 2012
INVENTOR(S) : Schneider et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On the Title Page, item (56), under "OTHER PUBLICATIONS", in Column 2, Line 1, delete "the Telephone" and insert -- The Telephone --, therefor.

On Page 5, item (56), under "OTHER PUBLICATIONS", in Column 2, Line 12, delete "al.;" and insert -- al., --, therefor.

On Page 5, item (56), under "OTHER PUBLICATIONS", in Column 2, Line 13, delete "http:--ww.faqs.org-rfcs-rfc954.html." and insert -- http:--www.faqs.org-rfcs-rfc954.html. --, therefor.

On Page 5, item (56), under "OTHER PUBLICATIONS", in Column 2, Line 25, delete "Schol," and insert -- School, --, therefor.

On Page 5, item (56), under "OTHER PUBLICATIONS", in Column 2, Line 38, delete "new_pr_51700.hmtl." and insert -- new_pr_51700.html. --, therefor.

In Column 2, Line 47, delete "URLs" and insert -- URIs --, therefor.

In Column 12, Line 34, in Claim 8, delete "said" and insert -- [said] *a* --, therefor.

Signed and Sealed this
Twenty-sixth Day of February, 2013

Teresa Stanek Rea
Acting Director of the United States Patent and Trademark Office