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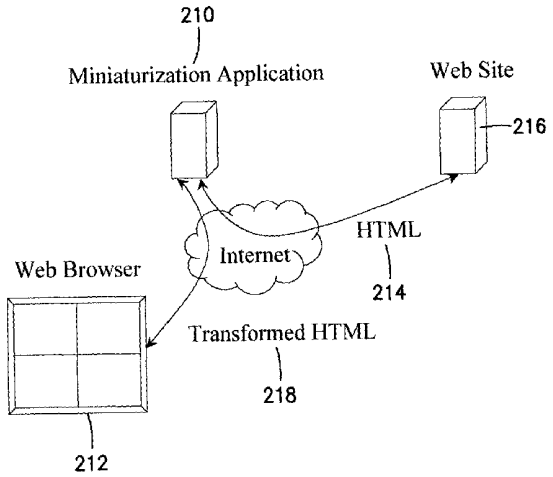
(54) Title: SERVER-SIDE WEB BROWSING AND MULTIPLE LENS SYSTEM, METHOD AND APPARATUS



(57) Abstract: Display information in a single browser window includes at least one lens (212), wherein each lens controls server side web browsing and allows the user to view a separate web page from the internet. The host server (216) provides personalized web browsing capability specific to a particular user independent of the browser, device or location of the user. After the user submits a request to view a particular web page, the web page information is retrieved by the host server and transmitted to the user for display within a selected lens. Each lens controls server-side web browsing through independent navigational controls, such as a horizontal and vertical scroll bar, a resize button and the like. One lens may also control the web content displayed in another lens. The host server may reformat entire web pages so that they can be displayed within a lens without the need for scrolling (210). Additionally, each lens may have multiple cookies associated therewith. Users may further submit bookmarks which are applicable to one or more of the lenses. Bookmarks may be recognized through initiating a single command.

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SERVER-SIDE WEB BROWSING AND MULTIPLE LENS SYSTEM, METHOD AND APPARATUS

FIELD

A server-side web browsing and multiple lens system, method and apparatus directed to electronic document processing, and more particularly directed to structured electronic documents (*e.g.* HTML, XML) which present multiple web pages within a single browser window.

BACKGROUND

In general, computer application programs may be implemented in two ways. First, a user may load and execute a local application program. Local application programs have processing instructions that are stored in a memory of the same computing device from which the user executes commands. In order to receive upgrades to these applications, a user must download and install any new version of the software. Because such local applications are also computer specific, they also do not provide personalized web browsing capability specific to a particular user and independent of the browser, platform, machine and/or location of the user.

Remote applications are accessed and implemented by a user over a computer network, such as the Internet. Generally, a user may access a remote server and request that an application be activated. The remote server then transmits display data and processing instructions to the user's computing device over the network. Such "thin-client" devices, *e.g.*, wireless and handheld devices, are limited by memory, screen size, processing and bandwidth constraints. In applications involving such devices, the commands must first be transmitted from the user's computing device to the remote server that runs the application. These applications are advantageous in that any upgrades to the software may be implemented by an operator of the server, rather than being downloaded and installed by each individual user.

One type of frequently-used application program is a web browsing application or "browser" which is generally used to view information on the Internet, such as pages of HTML data, graphical data (*e.g.* data presented in a GIF format, TIFF format or JPEG format), and multimedia presentations (*e.g.* data presented in MPEG formats). Most common web browsers present a single display area in which web page content is presented. Examples of such browsers include INTERNET EXPLORER 3.0 and NETSCAPE NAVIGATOR 4.0. The window in which the browser is active typically has navigational controls such as a horizontal scroll bar, a vertical scroll bar, a minimize command button, a maximize command button, a forward command button, a backward command button and a close window lens command button. Such controls are specific to the browser application in the displayed window and are typically implemented by the operating system (*e.g.* WINDOWS 95/98/NT/2000) rather than the browser itself.

Typically, users will visit more than one web page or web site in each browsing session, and will often want to return to and make comparisons with a previously-viewed page. Consequently, browsers with a single display area are troublesome in that a user must open multiple windows on their computing device if they wish to view more than one web page at a time. To view a previous page in such browsers, the user must repeatedly select a "back" button until the previously-viewed page is displayed. These limited features inhibit navigation on the Internet. Limited navigation ability is particularly pertinent to thin-client devices where memory, screen size, processing and bandwidth are constrained or limited.

Recently, several browsers have been introduced which provide separate display areas that allow viewing of more than one web page. One example of this type of browser is INTERNET EXPLORER 5.0 which allows a designated search page to be presented in a smaller display area of the window in which the browser is active. A larger display area is provided within the same window to view a current web page accessed by the user. However, INTERNET EXPLORER 5.0 does not provide separate navigational controls for the separate display areas within the window. Also, a user may not specify a web page other than a designated search page for presentation in the smaller display area.

A second example of a multiple-view web browser is the browser of BROADPAGE.COM. Each display area in the BROADPAGE.COM browser has

independent navigational controls. However, the browser is a local application, not a remote application. Furthermore, multiple views are, presented in a tiled fashion rather than side-by-side, so that portions of previously viewed documents become partially obscured when selecting a new web page to view. The browser of KATIESOFT.COM is another example of a local application where the multiple views are presented in a non-ovarlapping manner.

In addition to the shortcomings presented above, current browsers suffer from other limitations in their functionality. For example, browsers typically include the ability to bookmark a web page that is being viewed. Bookmarking, as referred to herein, is the process by which a user designates that a web page identifier (*e.g.* a uniform resource locator (URL)) is to be stored within the browser so that, upon later selection of the stored address, the web page may be viewed. Currently, several steps must be taken to bookmark a web page after it is presented to the user. First, the user must typically activate a general bookmark command button. Next, the user must designate that the bookmark is to be added to a bookmark folder, and, perhaps, determine a location within the folder to which the bookmark information is to be stored. Finally, a confirmation of the bookmark must be entered. Thus, bookmarking has traditionally been a multi-step process.

Another disadvantage of common browser systems is that bookmarks are saved in the local computer device. Thus, they are not portable from one device to another.

Still another disadvantage of common browsers is that they generally do not allow the entire content of a web page to be viewed at once. Many web pages contain content, the size or length of which may exceed the display area of a browser window. Typically, browsers rely on the scroll bar functions provided by the operating system to allow a user to scroll through the web site content. The ability to reformat a web page so that its entire content can be viewed within the display area of a window without scrolling has not been possible in earlier browsing systems. The need for reformatting web pages is particularly pertinent to thin-client devices with limited screen displays.

SUMMARY

The above-identified problems are solved and a technical advance is achieved by a server side web browsing and multiple lens system, method and apparatus. One advantage of the system, method and apparatus is that a host server presents centralized memory and processing to facilitate communications with thin-client devices.

Another advantage of the host server is to present multiple web page information to a user through server-side programming, which facilitates web page persistence across session, browser, device and location, *i.e.*, the host server provides personalized web browsing capability specific to a particular user independent of the browser, platform, device and/or location of the user.

Yet another advantage of the host server is that it enables translations on the fly from one protocol received from a third party server to another protocol for display to a user on a remote device. For example, the remote server can reformat web content received from a third party server so that it can be displayed within the display area of a user's device. Consequently, a user may view the entire contents of a reformatted web page within the display area of a single lens or browser window, *i.e.*, a miniaturized full view screen in lieu of using a horizontal or vertical scroll bar. The host server can further translate any input language (*e.g.*, HTML, CSS, XML, XSL, XHTML, WML) to any output language (*e.g.*, HTML, WML) for display to a particular use.

Still another advantage of the host server is that it provides a centralized memory to store bookmarks and cookies so that they are portable from one device to another device. It is a further advantage of the system, method and apparatus that a user may bookmark a web page or a plurality of web pages with a single command and store it.

It is yet another advantage of the system, method and apparatus that each lens may have multiple cookies associated therewith. Alternatively, a cookie may be stored so that it is associated with a particular user regardless of the browser, platform, device and/or location of the user. Storing cookies on the server-side allows an unlimited number and size of cookies to be stored per user or lens. The server-side storage capacity for such cookies is particularly pertinent to thin-client devices which have limited storage capacity.

Still another advantage of the system, method and apparatus is that a user may simultaneously view and interact with a plurality of web pages within a single browser window through one or more lenses wherein each lens controls server-side web browsing through an independent and full range of navigational controls, *i.e.*, full browser control capability.

An advantage of the server-side browsing capability of the system, method and apparatus is that it enables multiple browsers for thin-client devices limited by memory, screen size, processing and bandwidth constraints.

Yet another advantage of the system, method and apparatus is that one lens can control the web content displayed in another lens. For example, one lens can be used to conduct a search and the results of the search can be displayed in another lens.

In one embodiment, the system, method and apparatus presents web content to a user at a remote device. According to the embodiment, a host server transmits display information to the user comprising at least one lens for presentation within a window of a browser on the user's device. Any number of lenses can be used in the system, method and apparatus. In alternative embodiments, the number of lenses are two, four or a plurality of lenses.

Each lens controls server-side web browsing and is operative to display a separate web page upon receiving a uniform resource locator or other web identifier (collectively "URL") from the user. Each lens controls server-side browsing through any number and type of navigational controls such as a uniform resource locator entry field, a horizontal scroll bar, a vertical scroll bar, a minimize command button, a maximize command button, a close lens command button, a forward command button, a backward command button, a bookmark command button, a reformat command button or a menu command button. In another embodiment, a lens may have a full range of navigational controls, *i.e.*, full browser control capability. In still another embodiment, one lens may control the web content displayed in another lens.

In other embodiments, the host server may receive an identifier from a user, verify the identifier and transmit display information to the user, such that the user has web page persistence across session, platform, browser, device and location. The host server may also store at least one cookie associated with each

lens or with a user's identifier. The host server may further receive a single bookmark command to bookmark a web page presented to a user and store a bookmark identifier corresponding to the web page.

In still another embodiment, the host server translates any protocol received by a third party server to a second protocol to be presented to a user on a remote device. The server receives from a third party server web page display data in a first language, such as hypertext markup language (HTML), cascading style sheet language (CSS), extensible markup language (XML), extensible stylesheet language (XSL), extensible hypertext markup language (XHTML) or wireless markup language (WML) and translates the data into a second language, such as HTML or WML, for presentation on the remote device.

In yet another embodiment, the web page display data received by the host server from a third party server is reformatted by the host server so that substantially all of the display data can be displayed within the display area of the lens or window on the remote device. The server determines the size of the display area of the lens or window of a remote device. If the size of the display data is greater than the size of the display area, the server reformats the display data so that it can be presented with the display area of the lens. The server can reformat the size of the display data to be substantially equal to the size of the display area. Alternatively, if the size of the display data is less than the size of the display area, the server can reformat the size of the display data to be substantially equal to the size of the display area.

In still another embodiment, a user transmits a request to the server to reformat a web page. In response to the request, the host server reformats the web page so that substantially all of the display data is displayed within the display area of the user's lens or window, such that the user does not have to use a horizontal or vertical scroll bar to view the data. In an alternative embodiment, the web page can be reformatted by the server to any percentage of its original size selected by the user.

It is not intended that the server-side web browsing and multiple lens system, method and apparatus be summarized here in its entirety. For example, the system, method and apparatus is also directed to a remote device for receiving display information from the host server, including at least one lens present within a

window of a browser on the remote device, wherein each lens controls server-side web browsing. The system, method and apparatus is further directed to a computer readable medium having computer executable software code stored thereon for presenting, through a host server, web content to a user at a remote terminal and for receiving web content at a remote device. Further features, aspects and advantages of the system, method and apparatus are set forth in or are apparent from the following brief and detailed descriptions and drawings and claims which follow.

BRIEF DESCRIPTION OF THE DRAWINGS

Further aspects of the server-side web browsing and multiple lens, system, method and apparatus will be more readily appreciated upon review of the detailed description set forth below when taken in conjunction with the accompanying drawings, of which:

FIG. 1 is a block diagram illustrating an exemplary computer network including the application host server;

FIG. 2 is a block diagram of exemplary components of an application host server for use with the system of FIG. 1;

FIGS. 3-12 are a flowchart of an exemplary process by which a user may simultaneously view and bookmark a plurality of web pages;

FIGS. 13-15 are a flowchart of an exemplary process by which a user may maximize or minimize a lens containing web page display data;

FIG. 16 is an exemplary screen display depicting a user log-in page;

FIG. 17 is an exemplary screen display of a hierarchical tree structure (*i.e.*, a menu) for administering the content of a lens;

FIG. 18 is an exemplary screen display depicting a plurality of lenses within a single browser window;

FIG. 19 is an exemplary screen display of a lens having full browser capability;

FIG. 20 is an exemplary screen display of a maximized lens;

FIG. 21 is an exemplary network illustrating a dynamic miniaturization application; and

FIG. 22 is an exemplary illustration of a miniaturized web page to be presented within a display area of a lens or a browser window.

It will be understood that the foregoing brief description and the following detailed description are exemplary and explanatory of this invention, but are not intended to be restrictive thereof or limiting of the advantages which can be achieved by this invention. Thus, the accompanying drawings, referred to herein and constituting a part hereof, illustrate embodiments of this invention and, together with the detailed description, serve to explain the principles of this invention.

DETAILED DESCRIPTION

Referring now to FIG. 1, in general, the server-side web browsing and multiple lens system, method and apparatus allows a user at a remote device 2 to access an application host server 16 which implements multiple lens displays. The server 16 generates appropriate display data and transmits the same to the user for display within a single window of a local web browsing application. The display data formats the window to present at least one lens. The display data can be customized for each user to present data through as many lenses as suits a user's needs, *e.g.*, two, three, four, five, six or more lenses can be presented. The lenses can also be formatted in any shape or orientation.

Each lens controls server-side web browsing through independent navigational controls. The controls allow a user to, *inter alia*: (i) select a web page URL to be displayed; (ii) navigate backward and forward through a viewing history of web pages; (iii) scroll up or down or from side to side; (iv) maximize or minimize selected web pages; and (v) bookmark a web page with a single command. Such server-side browsing is accomplished by a server which presents command buttons or text entry fields having embedded commands associated therewith. The embedded commands generally take the form of:

http:// <server>:<port>/<multiple lens system>/?JLMClick=<command>[&<attribute name>=<attribute value>...]

where:

server	=	the host name of the server running the multiple lens system;
port	=	the port number on which the multiple lens system receives commands;
multiple lens system	=	the resource name of the multiple lens system;

command	=	the different commands for various lens operations described below;
attribute name	=	the argument name of a specific command; and
attribute value	=	the argument value of a specific command.

The commands used to implement the server-side web browsing and multiple lens system generally include the following:

NAME:	ATTRIBUTE:	ACTION:
JLSShowCurrentDesktop	None	Instructs the server to show the current web pages within a single window. The server keeps a copy of the web page identifiers so that in the event of a network interruption or user sign-out, the same display of web pages will persist across sessions.
JLSShowTile	JLVRows, JLVColumns	Tiles all lenses into JLVRows and JLVColumns. If one or both attributes are not specified, current row and column values are taken from the operating system of the user's device values.
JLSShowRow	JLVRow	Shows all lenses on a horizontal row of the window. JLVRow contains the row number starting from, *i.e.*, 1 at the top of the window.
JLSShowLens	JLVLens, JLVType	Shows a lens. JLVLens specifies the coordinates of the lens where, *i.e.*, 11 may designate the top left position, *i.e.*, 12 the top right position, *i.e.*, 21 the bottom left position and, *i.e.*, 22 the bottom right position. JLVType specifies how to show the lens (*e.g.* minimized or maximized).
JLSShowTitle	JLVLens, JLVType	Shows the title bar of a web page displayed in a lens.

JLSShowCurrentView	JLVLens	Shows the current view of a lens.
JLSShowPreviousView	JLVLens	Shows the previous view of a lens.
JLSShowNextView	JLVLens	Shows the next view of a lens.
JLSShowSystemMenu	JLVLens	Shows menu web page in a lens.
JLSAddLens	JLVTitleText, JLVIcon	Adds a lens to the window.
JLSRemoveLens	JLVLens	Removes a lens from the window.
JLSGetLenses	None	Retrieves the number of lenses displayed in the window.
JLSGetRows	None	Retrieves the number of rows in the window.
JLSGetColumns	None	Retrieves the number of columns in the window.
JLSGetTitleText	JLVLens	Retrieves the title text of a lens.
JLSGetIcon	JLVLens	Retrieves the icon of a lens.
JLSSetRows	None	Sets the number of rows in the window.
JLSSetColumns	None	Sets the number of columns in the window.
JLSSetTitleText	JLVLens	Sets the title text of a lens.
JLSSetIcon	JLVLens	Sets the icon of a lens.

The commands may implement programming scripts, such as may be generated in JAVASCRIPT, to perform the corresponding action. In response to these commands, the server 16 generates output in a suitable browser-compatible language such as HTML. The output includes use of FRAME or IFRAME commands to generate a multiple lens display. For each new command received from the user, the output is regenerated and re-transmitted by the server 16 for display on the user device 2. The output may be further updated if a selected web page in the display transmits refresh information or new data.

In an example of the use of these commands, a server 16 may authenticate a user who is accessing the multiple lens system. After authentication, the user, through the local web browser, transmits to the server 16 a redirection command including the JLSShowCurrentDesktop command. The server 16 may reply to the command by, for example, outputting HTML framing commands which set title bars, status bars, display areas and borders for all the lenses to be displayed in a window controlled by the local browser. When the user wants to change the layout of the window or when the user adds or removes lenses from the window, the local browser transmits a JLSShowTile command to the server 16 which in turn will tile all the lenses according to current row and column parameters.

Turning again to FIG. 1, there is depicted an exemplary computer network 1 through which a plurality of remote devices 2, 4, 6 may communicate with server 16 and a plurality of third-party servers 10, 12, 14 via network connection 8 in any known manner. Computer network 1 can be an Internet-based network such as the World Wide Web. It may also be any one or more of a local area network (LAN), a wide-area network (WAN), an intranet environment, an extranet environment, a wireless network or any other type of computer network, such as those enabled over public switched telephone networks.

Remote devices 2, 4, 6 may each be any type of computing device, such as a personal computer, a workstation, a network terminal, a hand-held remote access device, a personal digital assistant (PDA) or any other device, including wireless devices, that can accomplish two-way electronic communication over the network connection 8. Specific functions and operations of user devices 2-6, third-party web site servers 10, 12, 14 and application host server 16 are discussed further below.

Turning now to FIG. 2, displayed therein are exemplary components of a computing device, such as server 16. Any of user remote devices 2, 4 and 6 or third-party web site servers 10, 12, 14 may share a similar configuration as follows. The primary component of server 16 is processor 20, which may be any commonly available microprocessor, such as the PENTIUM III manufactured by INTEL CORP. The processor 20 may be operatively connected to further exemplary components, such as RAM/ROM 26, a clock 28, input/output devices 30, and a memory 22 which, in turn, stores one or more computer programs 24.

Processor 20 operates in conjunction with random access memory and read-only memory. The random-access memory (RAM) portion of RAM/ROM 26 may be a suitable number of Single In-line Memory Module (SIMM) chips having a storage capacity (typically measured in kilobytes or megabytes) sufficient to store and transfer, *inter alia*, processing instructions utilized by processor 20 which may be received from application programs 24. The read-only memory (ROM) portion of RAM/ROM 26 may be any permanent non-rewritable memory medium capable of storing and transferring, *inter alia*, processing instructions performed by processor 20 during a start-up routine of server 16.

Clock 28 may be an on-board component of processor 20 which dictates a clock speed (typically measured in MHz) at which processor 20 performs and synchronizes, *inter alia*, communication between the internal components of server 16.

Input/output device(s) 30 may be one or more known devices used for receiving operator inputs, network data, and the like and transmitting outputs resulting therefrom. Accordingly, exemplary input devices may include a keyboard, a mouse, a voice recognition unit and the like for receiving operator inputs. Output devices may include any known devices used to present data to an operator of the server 16 or to transmit data over the computer network 1 to a remote user or customer. Accordingly, suitable output devices may include a display, a printer and a voice synthesizer connected to a speaker.

Other input/output devices 30 may include a telephonic or network connection device, such as a telephone modem, a cable modem, a T-1 connection, a digital subscriber line or a network card, for communicating data to and from other computer devices over computer network 1, such as remote device 2. In an embodiment involving a network server, communications devices used as input/output devices 30 can have capacity to handle high bandwidth traffic in order to accommodate communications with a large number of users 2-6.

Memory 22 may be an internal or external large capacity device for storing computer processing instructions, computer-readable data, and the like. The storage capacity of the memory 22 is typically measured in megabytes or gigabytes. Accordingly, memory 22 may be one or more of the following: a floppy disk in conjunction with a floppy disk drive, a hard disk drive, a CD-ROM disk and

reader/writer, a DVD disk and reader/writer, a ZIP disk and a ZIP drive of the type manufactured by IOMEGA CORP., and/or any other computer readable medium that may be encoded with processing instructions in a read-only or read-write format. Further functions of and available devices for memory 22 will be apparent.

Memory 22 may store, *inter alia*, a plurality of programs 24 which may be any one or more of an operating system such as WINDOWS 2000 by MICROSOFT CORP., and one or more application programs, such as a web hosting program. The programs 24 may include processing instructions for accomplishing a server-side web browsing system as described herein.

Turning now to FIGS. 3-12, therein is depicted an exemplary process 30 by which a user may simultaneously view a plurality of web pages. The process 30 may begin after a user at a remote device 2 selects the URL of an application host server 16 which offers a server-side, multiple lens, browsing application. As shown in FIG. 16, the URL for the host server 16 may be entered in the URL entry field 163 of the browser residing on the user's device 2. An exemplary sign-in window 160, such as the one presented in FIG. 16, may then be presented to the user. Window 160 can have menu and resize controls which are defined by the operating system residing on the user's device 2. Such menu and re-size controls may include a menu bar 161, a minimize command button 165, a maximize command button 167 and a close window command button 169. The window 160 may furthermore offer navigational controls such as URL entry field 163.

In order to complete the sign-in, the user may enter a user name or other unique identifier into user name field 162 and may further enter a password into password field 164 (step 32). An optional field such as company field 166 may be provided for those users that subscribe to the server 16 through a group affiliation, such as a corporation. Upon entering the field information into field 162, 164 and 166, the user may transmit such information to the remote server by selecting the sign-in button 168 with a pointing device, such as a mouse. If the information has been entered incorrectly or if the user decides not to log into the server 16, the user may select the cancel command button 158 to abort the sign-in.

After signing in, the server 16 may verify the sign-in information provided by the user, *e.g.*, confirm its validity, and transmit a screen display such as that depicted in window 180 of FIG. 18. The screen display may present the last web

page(s) browsed by the user (step 34). The window 180 may have at least one lens, two lenses, three lenses, four lenses 171, 173, 181 and 183, or more, each of which may present any URL indicated by the user. Each lens may have independent navigational controls, such as a maximize command button 182, a vertical scroll bar 185, and a horizontal scroll bar 187 as shown in FIG. 18, as well as a menu command button 192, a bookmark button 194, a backward command button 196, and a forward command button 198 as depicted in window 190 of FIG. 19, the functionality of each being described further hereinbelow. Each lens may further have a full range of navigational controls, *i.e.*, full browser control capability.

In one embodiment, one lens may control the web content displayed in another lens. For example, a user may use a first lens as a search engine to conduct an informational search on any topic. The results of the search can be directed by the first lens to be displayed in a second lens.

In some cases, the validity of the sign-in information may be confirmed by matching the user-entered information to user data stored by server 16 in memory 22. The stored user data may be in the form of a secure database (not shown) having a number of records and fields for storing user names, passwords, company affiliation information, a history of web pages viewed by the user, and the like. If there is no data that matches the user-entered information, then the user may not access the server. Otherwise, the process 30 continues as described below.

From step 34, the user may decide to enter a new page to view, bookmark a page, view a previous page in the user's history or view a next page in the viewer's history. If the user chooses to enter a new web page to view, the process continues to step 36 where the user selects the menu command button 192 from one of the lenses 171, 173, 181, 183 in which the user chooses the web page to be displayed. The menu command button 192 may be selected by using a pointing device such as a mouse or by using a tab feature on the device 2 to select the menu command button 192. The local web browser residing on the user's device 2 then electronically forwards the command over network connection 8 to the application host server 16 (step 38). In response to the received command, the server 16 can return a menu web page 175 as depicted in FIGS. 17 and 18 (step 40).

The hierarchical tree structure or menu web page 175 enables the user to select a number of options, including selecting a bookmark folder 172, a history

folder 174, and a field 176 for entering a URL. The menu web page may further contain a news folder for selecting news articles or web sites, a web portal folder for selecting a desired portal, an intranet option for selecting intranet files, and an extranet folder for selecting extranet files. If the user selects the bookmark folder, the process 30 continues to step 88, as discussed below with respect to FIG. 9. If the user selects the history folder 174, the process continues to step 96 as described below with respect to FIG. 10. Alternatively, the user may instead enter a desired URL into URL entry field 176 (step 42) and then select the view button 178 to transmit the requested URL to the server 16 (step 44). The process 30 then continues to step 104 discussed below in conjunction with FIG. 11.

As described above with respect to step 34, a user may proceed to bookmark a web page after the remote server transmits display information to the user. In such a case, the process 30 continues to step 46 where the user selects the bookmark button 194 in a lens in which the desired web page is displayed. The browser residing on the user's device 2 then transmits the bookmark command to the server 16 over network connection 8 (step 48). The bookmark command may be performed in a single step, that is, by selecting the bookmark command button 194 without additional inputs. The server 16 may then store the bookmark in a location which is accessed through the user's bookmark folder 172 (step 50). The server 16 may then refresh the current web page being viewed (step 52) which is then displayed in the appropriate lens on the user's device 2 (step 54), after which the process 30 returns to step 34, described above.

Referring now to FIG. 6, the process 30 may continue from step 34 to step 56 where the user may select the backward command button 196 in a desired lens. Similar to the back command on a standard browser, the backward command is a request to view a previous web page in a viewing history of the selected lens. In response to the selection of the backward command button 196, the web browser residing on the user's device 2 transmits the backward command to server 16 over network connection 8 (step 58). If a previously-viewed web page exists, the process 30 continues to step 76, discussed below with respect to FIG. 8. Otherwise, the process 30 continues to step 62 where the server 16 refreshes the current web page being viewed, after which the refreshed web page is displayed on the user's device 2 (step 64). The process 30 then returns to step 34, discussed previously above.

Referring now to FIG. 7, the process 30 may continue from step 34 to step 66 where the user may select the forward command button 198 in a desired lens. Similar to the forward command on a standard browser, the forward command of the system is a request to view a subsequent web page in a viewing history of the selected lens. In response to the selection of the forward command button 198, the web browser residing on the user's device 2 transmits the forward command to server 16 over network connection 8 (step 68). If a next web page exists, the process 30 continues to step 76, discussed below with respect to FIG. 8. Otherwise, the process 30 continues to step 72 where the server 16 refreshes the current web page being viewed, after which the refreshed web page is displayed on the user's device 2 (step 74). The process 30 then returns to step 34, discussed previously above.

Referring now to FIG. 8, process 30 continues from either step 60 or 70 described above to step 76 where the server 16 transmits a request over network connection 8 to a third-party server (*e.g.* web site server 10, 12, 14) which hosts the requested web page. In response, the third-party server transmits web page data to the server 16 (step 78). The server 16 may then process the received data into a format suitable for transmission to the user's device 2 (step 80). The server 16 may further add the URL corresponding to the received data to the user's viewing history (step 82). The server 16 then transmits web page display data to the user including the reformatted web page data (step 84) which is then displayed in the appropriate lens on user device 2 (step 86). The process 30 then returns to step 34 above.

In processing the web page display data received from a third party server, the host server can translate such data on the fly for presentation on a user device. For example, data received from a third party server may be in any form, including HTML, CSS, XML, XSL, XHTML or WML. The host server can translate such data into any other form, such as HTML or WML, for presentation on a user's device. As discussed further below, the host server can further reformat web page data received from a third party server on the fly.

Turning to FIG. 9, process 30 may continue from step 40 described above to step 88, where the user selects the bookmark folder 172 from a menu web page 175 displayed in a lens 171. The browser on the user's device 2 then transmits a bookmark folder request over network connection 8 to server 16 (step 90). In response to the request, the server 16 generates a bookmark list page showing all

the bookmarks stored for the user and transmits the data for display in the lens 171 on the user device 2 (step 92). The user may then choose one of the desired bookmarks (step 94) after which the process 30 continues to step 104, described below with respect to FIG. 11.

Referring now to FIG. 10, the process 30 may continue from step 40 to step 96 where the user may select the history folder 174 from the menu web page 175 displayed in the lens 171. The web browser residing on user device 2 then transmits a request for viewing history data to server 16 over network connection 8 (step 98). The server 16 then generates a page displaying a predetermined number of web pages which the user has previously visited and transmits the same for display in the lens 171 of user device 2 (step 100). The user may then select one of the web pages from the viewing history (step 102), after which the process 30 continues to step 104, discussed immediately below.

Referring now to FIG. 11, the process 30 may continue from any of steps 44, 94 or 102 described above to step 104 where the browser residing on the user's device 2 transmits a requested web page to the server 16 over network connection 8. The server 16, in turn, sends a request for the web page to the appropriate third-party server, *e.g.* web site server 10, over network connection 8 (step 106). The third-party server then transmits the requested web page data back to the server 16 (step 108), after which the process 30 continues to step 110, discussed immediately below.

Turning now to FIG. 12, the process 30 continues to step 110 where the server 16 processes the received web page data to generate display data wherein the requested web page will be presented in the appropriate lens 171. The server 16 then adds the current URL to the most recent spot in the user's viewing history folder (step 112). Next, the server 16 transmits the generated display data to the user device 2 over network connection 8 (step 118). Upon receipt, the web browser residing on the user's device presents the multi-lens display to the user with the requested web page displayed in the appropriate lens 171 (step 116). The process 30 then returns to step 34, described above. Process 30 may continue until the user exits the browser, turns off the user device 2, or otherwise halts communication with server 16.

In addition to providing a user with the ability to view multiple web sites in a suitable number of lenses within a single browser window, and to navigate through different web sites using command buttons presented by a remote server 16, one embodiment allows a user to maximize a selected web page within the browser window. A process 131 for maximizing and minimizing one of a plurality of web pages within a single browser window is presented in FIGS. 13-15. Referring now to FIG. 13, the process 130 begins after a user enters a URL for a host server 16 in the URL entry line 163 of the browser residing on user device 2 which, in turn, establishes a link to the server 16 via network connection 8. The server 16 first transmits a sign-in page, such as the one presented in window 160 of FIG. 16.

The user may fill in a user name and password in the appropriate fields 162 and 164, as well as affiliation information, if applicable, and selects the sign-in button 168 (step 132). The local browser then transmits the sign-in request to the server 16 over network connection 8 (step 134). Upon receipt, the server 16 matches the received sign-in information to valid, stored user sign in data, and authenticates the user if matching data is found (step 136). The server 16 may also retrieve the last web pages viewed by the user and generates display data including at least two frames which display the last web pages viewed (step 138). The display information is then transmitted over network connection 8 to the user device 2 for display to the user (step 140). The display information may include HTML FRAME or IFRAME commands for generating the multiple lens display. The process 130 then continues to step 142, described immediately below.

Turning now to FIG. 14, the process 130 continues to step 142 where the user may wish to view a maximized version of a web page displayed in one of the plurality of lenses 171, 173, 181, 183. To accomplish this, the user may select the maximize button 182 in the desired lens. The local browser then transmits the maximize request to the server 16 over network connection 8 (step 144). In response, server 16 generates new display data in which only the selected web page will be viewed within the browser window. The new display data is then transmitted to the user device 2 over the network connection 8 (step 146). The resulting display may resemble the window 200 in FIG. 20. The process 130 then continues to step 148, discussed below.

Turning now to FIG. 15, the process continues to step 148, where the user enters a command to minimize the web page. This may be accomplished by selecting the minimize button 202 as displayed in FIG. 20. The local browser transmits the minimize request to the server 16 over the network connection 8 (step 150). The server 16 then generates new display data including the plurality of lenses with the formerly maximized web page presented in its original lens (step 152), after which the process 130 returns to step 142, described above. Process 130 may continue until the user exits the browser, turns off the user device 2, or otherwise halts communication with server 16.

In another embodiment, it is possible for the server to store multiple cookies for each lens of the user's display. Cookies refer to files transmitted by third-party servers 10, 12, 14 and which are typically stored in memory 22 of a user's device 2. The cookies may serve to identify the user to the third-party server. Rather than storing cookies on the user's device 2, the server 16 may store the cookies in the server's memory 22 and associate the same with the particular user. Cookies may be further designated as belonging to a particular lens of the user's multiple lens display rather to the user in general.

In still another embodiment, the display information may be configured by the server 16 so that substantially all the content of a selected web page may be reformatted to fit within the display area of a lens or browser window. Typically, a web page contains more data than will fit within the display area of a window. In such a case, horizontal and vertical scroll bars 187, 185 are provided so that a user may view all the content of the web page. However, it may be desirable to allow the user to view the entire content at once. Accordingly, the system, method and apparatus allow the server to reformat the display information received from a third party server 10 so that substantially all the content of a web page can be presented within the display area of a lens or a local browser window. This may be accomplished by reducing the font size of the text of the web page, compressing pixel data associated with the web content, or in any other manner. The display data of a selected web page may be reformatted to present substantially all content of the web page within the display area of each lens, either automatically or in response to a user request. A user can request that the web page display data be reformatted to any percentage of its original size. Alternatively, the system can be utilized to

increase the size of web page data so that it is substantially the same size as a larger display area.

The server-side web browsing and multiple lens system, method and apparatus enables dynamic miniaturized viewing of web pages. The system, method and apparatus is particularly suitable for thin-client technology where the viewing screen is on a small scale basis, such as in a multiple lens system described herein wherein the display area of each lens may be substantially smaller than the browser window, or in hand-held remote access wireless devices or PDA's.

FIG. 21 illustrates miniaturization application 210 as it is applied to a multiple lens display in web browser 212. To view a web page, a web browser sends a request with the appropriate URL to the system that in turns retrieves the HTML content 214 from the corresponding web site 216. The system applies the appropriate transformations to the HTML content before forwarding the reformatted or transformed HTML 218 to web browser 210. The transformations reduce the view size of the web content so that the web content can be easily viewed within a small size viewing area.

The system uses cascading style sheet technology to reduce the default text size of a web page. It also transforms the width, height and size attributes to HTML tags such as <table>, <td>, <img>, and <font>. In an exemplary illustration of the transformations, the system is programmed to reduce the view size by 50%. The system sets the default text size using cascading style sheet to 8 point size where the normal size is 12 point size. The system also reduces the width, height and size attributes of HTML tags such as <table>, <td>, <img>, and <font>, to half the original value. An example of a reformatted web page shown in its reduced size is illustrated in FIG. 22.

In an alternative embodiment, the system can be programmed to automatically reduce or enlarge the view size of a web page to any percentage of its original size, *e.g.*, 50%, 75%, 125%, 150%, 200%. Alternatively, the system can reduce or enlarge the view size of a web page to any percentage selected by a user.

Although illustrative embodiments have been described herein in detail, it should be noted and understood that the descriptions have been provided for purposes of illustration only and that other variations both in form and detail can be made thereupon without departing from the spirit and scope of this invention. The

terms and expressions have been used as terms of description and not terms of limitation. There is no limitation to use the terms or expressions to exclude any equivalents of features shown and described or portions thereof and this invention shown be defined with the claims that follow.

IN THE CLAIMS:

1. A method, performed by a host server, for presenting web content to a user at a remote device, comprising:

transmitting display information including at least one lens for presentation within a window of a browser on said remote device, wherein each lens controls server-side web browsing.

2. The method of claim 1, further comprising:

receiving a uniform resource locator through a first lens; and

transmitting a web page corresponding to said uniform resource locator for display in said first lens.

3. The method of claim 2, further comprising receiving web page display data corresponding to said web page from a second server.

4. The method of claim 3, further comprising:

receiving said web page display data in a first language; and

translating said web page display data into a second language prior to transmission for display on said remote device.

5. The method of claim 4, wherein said first language comprises at least one of hypertext markup language, cascading style sheet language, extensible markup language, extensible style sheet language, extensible hypertext markup language and wireless markup language.

6. The method of claim 4, wherein said second language comprises at least one of hypertext markup language and wireless markup language.

7. The method of claim 1, further comprising four lenses.

8. The method of claim 1, wherein each lens has at least one navigational control.

9. The method of claim 8, wherein said navigational control comprises at least one of a uniform resource locator entry field, a horizontal scroll bar, a vertical scroll bar, a minimize command button, a maximize command button, a close lens command button, a forward command button, a backward command button, a bookmark command button, a reformat command button and a menu command button.

10. The method of claim 1, wherein each lens has full browser control capability.

11. The method of claim 1, wherein a first lens controls the web content displayed in a second lens.

12. The method of claim 1, wherein each lens is operative to present web page display data for any uniform resource locator received.

13. The method of claim 1, further comprising transmitting a login page comprising a user identifier field for display within said window, prior to transmitting said display information.

14. The method of claim 13, further comprising:
receiving a user identifier; and
verifying said user identifier.

15. The method of claim 14, wherein said user identifier comprises an identification code and a password.

16. The method of claim 2, further comprising:
receiving a single command to bookmark said web page; and
storing a bookmark identifier for said web page.

17. The method of claim 16, wherein said single command is

received through a bookmark command button associated with said first lens.

18. The method of claim 1, further comprising storing at least one cookie associated with each lens.

19. The method of claim 14, further comprising storing at least one cookie associated with said user identifier.

20. The method of claim 2, wherein said web page is transmitted such that only a portion of display data associated with said web page can be viewed within a display area of said first lens without using a horizontal scroll bar or a vertical scroll bar.

21. The method of claim 20, further comprising:

receiving a request from said user to reformat said web page; and

reformatting said web page in response to said request.

22. The method of claim 21, further comprising transmitting a reformatted web page to said user for display in said first lens, wherein substantially all of said display data can be viewed within said display area without using said horizontal scroll bar or said vertical scroll bar.

23. The method of claim 21, further comprising transmitting said web page reformatted to a percentage of its original size selected by said user.

24. The method of claim 2, further comprising:

receiving display data corresponding to said web page;

determining whether said display data has a size greater than or less than a display area of said first lens; and

reformatting said web page if said size of said display data is greater than or less than said display area.

25. The method of claim 24, further comprising transmitting a reformatted web page to said user for display in said first lens, wherein substantially all of said display data can be viewed within said display area without using a horizontal scroll bar or a vertical scroll bar.

26. The method of claim 24, further comprising transmitting said web page reformatted to a percentage of its original size selected by said user.

27. A method, performed by a host server, for presenting web content to a user at a remote device, comprising:

transmitting display information including at least two lenses for presentation within a window of a browser on said remote device, wherein each lens controls server-side web browsing;

receiving a first uniform resource locator through a first lens; and

transmitting a first web page corresponding to said first uniform resource locator for display in said first lens.

28. The method of claim 27, further comprising:

receiving a second uniform resource locator through a second lens; and

transmitting a second web page corresponding to said second uniform resource locator for display in said second lens.

29. The method of claim 27, further comprising receiving web page display data corresponding to said first web page from a second server.

30. The method of claim 29, further comprising:

receiving said web page display data in a first language; and

translating said web page display data into a second language prior to transmission for display on said remote device.

31. The method of claim 30, wherein said first language comprises

at least one of hypertext markup language, cascading style sheet language, extensible markup language, extensible style sheet language, extensible hypertext markup language and wireless markup language.

32. The method of claim 30, wherein said second language comprises at least one of hypertext markup language and wireless markup language.

33. The method of claim 27, further comprising four lenses.

34. The method of claim 27, wherein each lens has at least one navigational control.

35. The method of claim 34, wherein said navigational control comprises at least one of a uniform resource locator entry field, a horizontal scroll bar, a vertical scroll bar, a minimize command button, a maximize command button, a close lens command button, a forward command button, a backward command button, a bookmark command button, a reformat command button and a menu command button.

36. The method of claim 27, wherein each lens has full browser control capability.

37. The method of claim 27, wherein a first lens controls the web content displayed in a second lens.

38. The method of claim 27, wherein each lens is operative to present web page display data for any uniform resource locator received.

39. The method of claim 27, further comprising transmitting a login page comprising a user identifier field for display within said window, prior to transmitting said display information.

40. The method of claim 39, further comprising:

receiving a user identifier; and

verifying said user identifier.

41. The method of claim 40, wherein said user identifier comprises an identification code and a password.

42. The method of claim 27, further comprising:

receiving a single command to bookmark said first web page; and

storing a bookmark identifier for said first web page.

43. The method of claim 42, wherein said single command is received through a bookmark command button associated with said first lens.

44. The method of claim 27, further comprising storing at least one cookie associated with each lens.

45. The method of claim 40, further comprising storing at least one cookie associated with said user identifier.

46. The method of claim 27, wherein said first web page is transmitted such that only a portion of display data associated with said first web page can be viewed within a display area of said first lens without using a horizontal scroll bar or a vertical scroll bar.

47. The method of claim 46, further comprising:

receiving a request from said user to reformat said first web page; and

reformatting said first web page in response to said request.

48. The method of claim 47, further comprising transmitting a reformatted first web page to said user for display in said first lens, wherein substantially all of said display data can be viewed within said display area without

using said horizontal scroll bar or said vertical scroll bar.

49. The method of claim 47, further comprising transmitting said first web page reformatted to a percentage of its original size selected by said user.

50. The method of claim 27, further comprising:

receiving display data corresponding to said first web page;

determining whether said display data has a size greater than or less than a display area of said first lens; and

reformatting said first web page if said size of said display data is greater than or less than said display area.

51. The method of claim 50, further comprising transmitting a reformatted first web page to said user for display in said first lens, wherein substantially all of said display data can be viewed within said display area without using a horizontal scroll bar or a vertical scroll bar.

52. The method of claim 50, further comprising transmitting said web page reformatted to a percentage of its original size selected by said user.

53. A method, performed by a host server, for presenting web content to a user at a remote device, comprising:

receiving an identifier from said user;

verifying said identifier; and

transmitting display information including a plurality of lenses for presentation within a window of a browser on said remote device, wherein each lens controls server-side web browsing and is operative to display a separate web page upon receiving a uniform resource locator from said user.

54. The method of claim 53, further comprising:

receiving a first uniform resource locator through a first lens; and

transmitting a first web page corresponding to said first uniform resource locator for display in said first lens.

55. The method of claim 54, further comprising receiving web page display data corresponding to said first web page from a second server.

56. The method of claim 55, further comprising:
receiving said web page display data in a first language; and
translating said web page display data into a second language prior to transmission for display on said remote device.

57. The method of claim 56, wherein said first language comprises at least one of hypertext markup language, cascading style sheet language, extensible markup language, extensible style sheet language, extensible hypertext markup language and wireless markup language.

58. The method of claim 56, wherein said second language comprises at least one of hypertext markup language and wireless markup language.

59. The method of claim 53, further comprising four lenses.

60. The method of claim 53, wherein each lens has at least one navigational control.

61. The method of claim 60, wherein said navigational control comprises at least one of a uniform resource locator entry field, a horizontal scroll bar, a vertical scroll bar, a minimize command button, a maximize command button, a close lens command button, a forward command button, a backward command button, a bookmark command button, a reformat command button and a menu command button.

62. The method of claim 53, wherein each lens has full browser control capability.

63. The method of claim 53, wherein a first lens controls the web content displayed in a second lens.

64. The method of claim 53, wherein each lens is operative to present web page display data for any uniform resource locator received.

65. The method of claim 53, wherein said identifier comprises an identification code and a password.

66. The method of claim 54, further comprising:

receiving a single command to bookmark said first web page; and

storing a bookmark identifier for said first web page.

67. The method of claim 66, wherein said single command is received through a bookmark command button associated with said first lens.

68. The method of claim 53, further comprising storing at least one cookie associated with each lens.

69. The method of claim 53, further comprising storing at least one cookie associated with said user identifier.

70. The method of claim 54, wherein said first web page is transmitted such that only a portion of display data associated with said first web page can be viewed within a display area of said first lens without using a horizontal scroll bar or a vertical scroll bar.

71. The method of claim 70, further comprising:

receiving a request from said user to reformat said first web page; and

reformatting said first web page in response to said request.

72. The method of claim 71, further comprising transmitting a reformatted first web page to said user for display in said first lens, wherein substantially all of said display data can be viewed within said display area without using said horizontal scroll bar or said vertical scroll bar.

73. The method of claim 71, further comprising transmitting said first web page reformatted to a percentage of its original size selected by said user.

74. The method of claim 54, further comprising:

receiving display data corresponding to said first web page;

determining whether said display data has a size greater than or less than a display area of said first lens; and

reformatting said first web page if said size is greater than or less than said display area.

75. The method of claim 74, further comprising transmitting a reformatted first web page to said user for display in said first lens, wherein substantially all of said display data can be viewed within said display area without using a horizontal scroll bar or a vertical scroll bar.

76. The method of claim 74, further comprising transmitting said first web page reformatted to a percentage of its original size selected by said user.

77. A method for receiving web content at a remote device, comprising:

receiving display information from a host server, the display information including at least one lens presented within a window of a browser on said remote device, wherein each lens controls server-side web browsing.

78. The method of claim 77, further comprising:

transmitting a uniform resource locator through a first lens; and

receiving a web page corresponding to said uniform resource locator displayed in said first lens.

79. The method of claim 77, further comprising four lenses.

80. The method of claim 77, wherein each lens has at least one navigational control.

81. The method of claim 80, wherein said navigational control comprises at least one of a uniform resource locator entry field, a horizontal scroll bar, a vertical scroll bar, a minimize command button, a maximize command button, a close lens command button, a forward command button, a backward command button, a bookmark command button, a reformat command button and a menu command button.

82. The method of claim 77, wherein each lens has full browser control capability.

83. The method of claim 77, wherein a first lens controls the web content displayed in a second lens.

84. The method of claim 77, wherein each lens is operative to present web page display data for any uniform resource locator received.

85. The method of claim 77, further comprising, prior to receiving said display information, receiving a login page comprising a user identifier field.

86. The method of claim 85, further comprising transmitting a user identifier.

87. The method of claim 86, wherein said user identifier comprises an identification code and a password.

88. The method of claim 78, further comprising transmitting a single command to bookmark said web page.

89. The method of claim 88, wherein said single command is transmitted through a bookmark command button associated with said first lens.

90. The method of claim 78, wherein said web page is received such that only a portion of display data associated with said web page is viewed within a display area of said first lens without using a horizontal scroll bar or a vertical scroll bar.

91. The method of claim 90, further comprising transmitting a request to reformat said web page.

92. The method of claim 91, further comprising receiving a reformatted web page displayed in said first lens, wherein substantially all of said display data is viewed within said display area without using said horizontal scroll bar or said vertical scroll bar.

93. The method of claim 91, further comprising receiving said web page reformatted to a percentage of its original size selected by a user.

94. The method of claim 78, wherein said web page is reformatted such that substantially all of said web page display data is viewed within a display area of said first lens without using a horizontal scroll bar or a vertical scroll bar.

95. The method of claim 78, wherein said web page is reformatted to a percentage of its original size selected by a user.

96. A method for receiving web content at a remote device, comprising:

receiving display information from a host server, the display information including at least two lenses presented within a window of

a browser on said remote device, wherein each lens controls server-side web browsing;

transmitting a first uniform resource locator through a first lens; and

receiving a first web page corresponding to said first uniform resource locator displayed in said first lens.

97. The method of claim 96, further comprising:

transmitting a second uniform resource locator through a second lens; and

receiving a second web page corresponding to said second uniform resource locator displayed in said second lens.

98. The method of claim 96, further comprising four lenses.

99. The method of claim 96, wherein each lens has at least one navigational control.

100. The method of claim 99, wherein said navigational control comprises at least one of a uniform resource locator entry field, a horizontal scroll bar, a vertical scroll bar, a minimize command button, a maximize command button, a close lens command button, a forward command button, a backward command button, a bookmark command button, a reformat command button and a menu command button.

101. The method of claim 96, wherein each lens has full browser control capability.

102. The method of claim 96, wherein a first lens controls the web content displayed in a second lens.

103. The method of claim 96, wherein each lens is operative to present web page display data for any uniform resource locator received.

104. The method of claim 96, further comprising, prior to receiving said display information, receiving a login page comprising a user identifier field.

105. The method of claim 104, further comprising transmitting a user identifier.

106. The method of claim 105, wherein said user identifier comprises an identification code and a password.

107. The method of claim 96, further comprising transmitting a single command to bookmark said first web page.

108. The method of claim 107, wherein said single command is transmitted through a bookmark command button associated with said first lens.

109. The method of claim 96, wherein said first web page is received such that only a portion of display data associated with said first web page is viewed within a display area of said first lens without using a horizontal scroll bar or a vertical scroll bar.

110. The method of claim 109, further comprising transmitting a request to reformat said first web page.

111. The method of claim 110, further comprising receiving a reformatted first web page displayed in said first lens, wherein substantially all of said display data is viewed within said display area without using said horizontal scroll bar or said vertical scroll bar.

112. The method of claim 110, further comprising receiving said first web page reformatted to a percentage of its original size selected by a user.

113. The method of claim 96, wherein said first web page is

reformatted such that substantially all of said first web page display data is viewed within a display area of said first lens without using a horizontal scroll bar or a vertical scroll bar.

114. The method of claim 96, wherein said first web page is reformatted to a percentage of its original size selected by a user.

115. A method for receiving web content at a remote device, comprising:

transmitting an identifier to a host server; and

receiving display information from said host server, the display information including a plurality of lenses presented within a window of a browser on said remote device, wherein each lens controls server-side web browsing and is operative to display a separate web page after transmission of a uniform resource locator to said host server.

116. The method of claim 115, further comprising:

transmitting a first uniform resource locator through a first lens; and

receiving a first web page corresponding to said first uniform resource locator displayed in said first lens.

117. The method of claim 115, further comprising four lenses.

118. The method of claim 115, wherein each lens has at least one navigational control.

119. The method of claim 118, wherein said navigational control comprises at least one of a uniform resource locator entry field, a horizontal scroll bar, a vertical scroll bar, a minimize command button, a maximize command button, a close lens command button, a forward command button, a backward command button, a bookmark command button, a reformat command button and a menu command button.

120. The method of claim 115, wherein each lens has full browser control capability.

121. The method of claim 115, wherein a first lens controls the web content of a second lens.

122. The method of claim 115, wherein each lens is operative to present web page display data for any uniform resource locator received.

123. The method of claim 115, further comprising, prior to receiving said display information, receiving a login page comprising a user identifier field.

124. The method of claim 123, further comprising transmitting a user identifier.

125. The method of claim 124, wherein said user identifier comprises an identification code and a password.

126. The method of claim 116, further comprising transmitting a single command to bookmark said first web page.

127. The method of claim 126, wherein said single command is transmitted through a bookmark command button associated with said first lens.

128. The method of claim 116, wherein said first web page is received such that only a portion of display data associated with said first web page is viewed within a display area of said first lens without using a horizontal scroll bar or a vertical scroll bar.

129. The method of claim 128, further comprising transmitting a request to reformat said first web page.

130. The method of claim 129, further comprising receiving a reformatted first web page displayed in said first lens, wherein substantially all of said display data is viewed within said display area without using said horizontal scroll bar or said vertical scroll bar.

131. The method of claim 129, further comprising receiving said web page reformatted to a percentage of its original size selected by a user.

132. The method of claim 116, wherein said first web page is reformatted such that substantially all of said first web page display data is viewed within a display area of said first lens without using a horizontal scroll bar or a vertical scroll bar.

133. The method of claim 116, wherein said first web page is reformatted to a percentage of its original size selected by a user.

134. A method, performed by a host server, for bookmarking a web page presented to a user at a remote device, comprising:

receiving a uniform resource locator transmitted by said user through a window of a browser on said remote device;

transmitting a web page corresponding to said uniform resource locator for display in said window;

receiving a single command from said user to bookmark said web page; and

storing a bookmark identifier corresponding to said web page.

135. The method of claim 134, wherein said single command is received through a bookmark command button associated with said window.

136. A method for bookmarking a web page received by a user at a remote device, comprising:

transmitting a uniform resource locator to a host server through a window of a browser on said remote device;

receiving a web page corresponding to said uniform resource locator displayed in said window; and

transmitting a single command to bookmark said web page.

137. The method of claim 136, wherein said single command is transmitted through a bookmark command button associated with said window.

138. A method, performed by a host server, for reformatting a web page presented to a user at a remote device, comprising:

receiving a uniform resource locator through a window of a browser on said remote device;

transmitting a web page corresponding to said uniform resource locator for display in said window, wherein only a portion of display data associated with said web page is visible within a display area of said window;

receiving a request from said user to reformat said web page; and

reformatting said web page in response to said request.

139. The method of claim 138, further comprising transmitting a reformatted web page to said user for display in said window, wherein substantially all of said display data is visible within said display area.

140. The method of claim 138, further comprising transmitting said web page reformatted to a percentage of its original size selected by said user.

141. A method for receiving a reformatted web page at a remote device, comprising:

transmitting a uniform resource locator to a host server through a window of a browser on said remote device;

receiving a web page corresponding to said uniform resource locator displayed in said window, wherein only a portion of display data associated with said web page is visible within a display area of said

window; and

transmitting a request to reformat said web page.

142. The method of claim 141, further comprising receiving a reformatted web page in response to said request, wherein substantially all of said display data is visible within said display area.

143. The method of claim 141, further comprising receiving said web page reformatted to a percentage of its original size selected by a user.

144. A method, performed by a host server, for reformatting a web page presented to a user at a remote device, comprising:

receiving display data corresponding to a web page requested by said user;

determining whether said display data has a size greater than or less than a display area available for viewing said web page; and

reformatting said web page if said size of said display data is greater than or less than said display area.

145. The method of claim 144, further comprising transmitting a reformatted web page to said user for display in said display area, wherein substantially all of said display data is visible within said display area.

146. The method of claim 144, further comprising transmitting said web page reformatted to a percentage of its original size selected by a user.

147. A method for receiving a reformatted web page at a remote device, comprising:

requesting a host server to transmit a web page for presentation in a display area of a window of a browser on said remote device; and

receiving from said host server a reformatted web page presented within said display area, wherein substantially all of said

reformatted web page is visible within said display area.

148. A method for receiving a reformatted web page at a remote device, comprising:

requesting a host server to transmit a web page for presentation in a display area of a window of a browser on said remote device; and

receiving from said host server said web page reformatted to a percentage of its original size selected by a user.

149. A host server for presenting web site content to a user at a remote device, comprising:

a storage device and a processor connected to the storage device,

the storage device storing a program for controlling the processor,

the processor operative with the program to,

transmit display information including at least one lens for presentation within a window of a browser on said remote device, wherein each lens controls server-side web browsing.

150. The host server of claim 149, wherein the processor is further operative with the program to:

receive a uniform resource locator through a first lens; and

transmit a web page corresponding to said uniform resource locator for display in said first lens.

151. The host server of claim 150, wherein the processor is further operative with the program to receive web page display data corresponding to said web page from a second server.

152. The host server of claim 151, wherein the processor is further operative with the program to:

receive said web page display data in a first language; and

translate said web page display data into a second language prior to transmission for display on said remote device.

153. The host server of claim 152, wherein said first language comprises at least one of hypertext markup language, cascading style sheet language, extensible markup language, extensible style sheet language, extensible hypertext markup language and wireless markup language.

154. The host server of claim 152, wherein said second language comprises at least one of hypertext markup language and wireless markup language.

155. The host server of claim 149, wherein said at least one lens comprises four lenses.

156. The host server of claim 149, wherein each lens has at least one navigational control.

157. The host server of claim 156, wherein said navigational control comprises at least one of a uniform resource locator entry field, a horizontal scroll bar, a vertical scroll bar, a minimize command button, a maximize command button, a close lens command button, a forward command button, a backward command button, a bookmark command button, a reformat command button and a menu command button.

158. The host server of claim 149, wherein each lens has full browser control capability.

159. The host server of claim 149, wherein a first lens controls the web content displayed in a second lens.

160. The host server of claim 149, wherein each lens is operative to present web page display data for any uniform resource locator received.

161. The host server device of claim 149, wherein the processor is further operative with the program to transmit a login page comprising a user identifier field for display within said window, prior to transmitting said display information.

162. The host server of claim 161, wherein the processor is further operative with the program to:

receive a user identifier; and

verify said user identifier.

163. The host server of claim 162, wherein said user identifier comprises on identification code and a password.

164. The host server of claim 150, wherein the processor is further operative with the program to:

receive a single command to bookmark said web page; and

store a bookmark identifier for said web page.

165. The host server of claim 164, wherein said single command is received through a bookmark command button associated with said first lens.

166. The host server of claim 149, wherein the processor is further operative with the program to store at least one cookie associated with each lens.

167. The host server of claim 162, wherein the processor is further operative with the program to store at least one cookie associated with said user identifier.

168. The host server of claim 150, wherein the processor is further operative with the program to transmit said web page such that only a portion of display data associated with said web page can be viewed within a display area of said first lens without using a horizontal scroll bar or a vertical scroll bar.

169. The host server of claim 168, wherein the processor is further operative with the program to:

receive a request from said user to reformat said web page; and

reformat said web page in response to said request.

170. The host server device of claim 169, wherein the processor is further operative with the program to transmit a reformatted web page to said user for display in said first lens, wherein substantially all of said display data can be viewed within said display area without using said horizontal scroll bar or said vertical scroll bar.

171. The host server of claim 169, wherein the processor is further operative with the program to transmit said web page reformatted to a percentage of its original size selected by said user.

172. The host server of claim 150, wherein the processor is further operative with the program to:

receive display data corresponding to said web page;

determine whether said display data has a size greater than or less than a display area of said first lens; and

reformat said web page if said size of said display data is greater than or less than said display area.

173. The host server of claim 172, wherein the processor is further operative with the program to transmit a reformatted web page to said user for display in said first lens, wherein substantially all of said display data can be viewed within said display area without using a horizontal scroll bar or a vertical scroll bar.

174. The host server of claim 172, wherein the processor is further operative with the program to transmit said web page reformatted to a percentage of its original size selected by said user.

175. A host server for presenting web content to a user at a remote device, comprising:

a storage device and a processor connected to the storage device,

the storage device storing a program for controlling the processor,

the processor operative with the program to,

(i) transmit display information including at least two lenses for presentation within a window of a browser on said remote device, wherein each lens controls server-side web browsing;

(ii) receive a first uniform resource locator through a first lens; and

(iii) transmit a first web page corresponding to said first uniform resource locator for display in said first lens.

176. The host server of claim 175, wherein the processor is further operative with the program to:

receive a second uniform resource locator through a second lens; and

transmit a second web page corresponding to said second uniform resource locator for display in said second lens.

177. The host server of claim 175, wherein the processor is further operative with the program to receive web page display data corresponding to said first web page from a second server.

178. The host server of claim 177, wherein the processor is further operative with the program to:

receive said web page display data in a first language; and

translate said web page display data into a second language prior to transmission for display on said remote device.

179. The host server of claim 178, wherein said first language comprises at least one of hypertext markup language, cascading style sheet language, extensible markup language, extensible style sheet language, extensible hypertext markup language and wireless markup language.

180. The host server of claim 179, wherein said second language comprises at least one of hypertext markup language and wireless markup language.

181. The host server of claim 175, wherein said at least two lenses comprises four lenses.

182. The host server of claim 175, wherein each lens has at least one navigational control.

183. The host server of claim 175, wherein said navigational control comprises at least one of a uniform resource locator entry field, a horizontal scroll bar, a vertical scroll bar, a minimize command button, a maximize command button, a close lens command button, a forward command button, a backward command button, a bookmark command button, a reformat command button and a menu command button.

184. The host server of claim 175, wherein each lens has full browser control capability.

185. The host server of claim 175, wherein a first lens controls the web content displayed in a second lens.

186. The host server of claim 175, wherein each lens is operative to present web page display data for any uniform resource locator received.

187. The host server of claim 175, wherein the processor is further operative with the program to transmit a login page comprising a user identifier field for display within said window, prior to transmitting said display information.

188. The host server of claim 187, wherein the processor is further operative with the program to:

receive a user identifier; and

verify the user identifier.

189. The host server of claim 188, wherein the user identifier comprises an identification code and a password.

190. The host server of claim 175, wherein the processor is further operative with the program to:

receive a single command to bookmark said first web page; and

store a bookmark identifier for said first web page.

191. The host server of claim 190, wherein said single command is received through a bookmark command button associated with said first lens.

192. The host server of claim 175, wherein the processor is further operative with the program to store at least one cookie associated with each lens.

193. The host server of claim 192, wherein the processor is further operative with the program to store at least one cookie associated with said user identifier.

194. The host server of claim 175, wherein said first web page is transmitted such that only a portion of display data associated with said first web page can be viewed within a display area of said first lens without using a horizontal scroll bar or a vertical scroll bar.

195. The host server of claim 194, wherein the processor is further operative with the program to:

receive a request from said user to reformat said first web

page; and

reformat said first web page in response to said request.

196. The host server of claim 195, wherein the processor is further operative with the program to:

transmit a reformatted first web page to said user for display in said first lens, wherein substantially all of said display data can be viewed within said display area without using said horizontal scroll bar or said vertical scroll bar.

197. The host server of claim 195, wherein the processor is further operative with the program to transmit said first web page reformatted to a percentage of its original size selected by said user.

198. The host server of claim 175, wherein the processor is further operative with the program to:

receive display data corresponding to said first web page;

determine whether said display data has a size greater than or less than a display area of said first lens; and

reformat said first web page if said size of said display data is greater than or less than said display area.

199. The host server of claim 198, wherein the processor is further operative with the program to transmit a reformatted first web page to said user for display in said first lens, wherein substantially all of said display data can be viewed within said display area without using a horizontal scroll bar or a vertical scroll bar.

200. The host server of claim 198, wherein the processor is further operative with the program to transmit said first web page reformatted to a percentage of its original size selected by said user.

201. A host server for presenting web content to a user at a remote device, comprising:

a storage device; and

a processor connected to the storage device,

the storage device storing a program for controlling the processor;

the processor operative with the program to,

(i) receive an identifier from said user;

(ii) verify said identifier; and

(iii) transmit display information to said user including a plurality of lenses for presentation within a window of a browser on said remote device, wherein each lens controls server-side web browsing and is operative to display a separate web page upon receiving a uniform resource locator from said user.

202. The host server of claim 201, wherein the processor is further operative with the program to:

receive a first uniform resource locator through a first lens; and

transmit a first web page corresponding to said first uniform resource locator for display in said first lens.

203. The host server of claim 202, wherein the processor is further operative with the program to receive web page display data corresponding to said first web page from a second server.

204. The host server of claim 203, wherein the processor is further operative with the program to:

receive said web page display data in a first language; and

translate said web page display data into a second language prior to transmission for display on said remote device.

205. The host server of claim 204, wherein said first language comprises at least one of hypertext markup language, cascading style sheet language, extensible markup language, extensible style sheet language, extensible

hypertext markup language and wireless markup language.

206. The host server of claim 204, wherein said second language comprises at least one of hypertext markup language and wireless markup language.

207. The host server of claim 201, wherein said plurality of lenses comprises four lenses.

208. The host server of claim 201, wherein each lens has at least one navigational control.

209. The host server of claim 208, wherein said navigational control comprises at least one of a uniform resource locator entry field, a horizontal scroll bar, a vertical scroll bar, a minimize command button, a maximize command button, a close lens command button, a forward command button, a backward command button, a bookmark command button, a reformat command button and a menu command button.

210. The host server of claim 201, wherein each lens has full browser control capability.

211. The host server of claim 201, wherein a first lens controls the web content displayed in a second lens.

212. The host server of claim 201, wherein each lens is operative to present web page display data for any uniform resource locator received.

213. The host server of claim 201, wherein said identifier comprises an identification code and a password.

214. The host server of claim 202, wherein the processor is further operative with the program to:

receive a single command to bookmark said first web page;

and

store a bookmark identifier for said first web page.

215. The host server of claim 214, wherein said single command is received through a bookmark command button associated with said first lens.

216. The host server of claim 201, wherein the processor is further operative with the program to store at least one cookie associated with each lens.

217. The host server of claim 201, wherein the processor is further operative with the program to store at least one cookie associated with said user identifier.

218. The host server of claim 202, wherein the processor is further operative with the program to transmit said first web page such that only a portion of display data associated with said first web page can be viewed within a display area of said first lens without using a horizontal scroll bar or a vertical scroll bar.

219. The host server of claim 218, wherein the processor is further operative with the program to:

receive a request from said user to reformat said first web page; and

reformat said first web page in response to said request.

220. The host server of claim 219, wherein the processor is further operative with the program to transmit a reformatted first web page to said user for display in said first lens, wherein substantially all of said display data can be viewed within said display area without using said horizontal scroll bar or said vertical scroll bar.

221. The host server of claim 219, wherein the processor is further operative with the program to transmit said first web page reformatted to a percentage of its original size selected by said user.

222. The host server of claim 202, wherein the processor is further operative with the program to:

receive display data corresponding to said first web page;

determine whether said display data has a size greater than or less than a display area of said first lens; and

reformat said first web page if said size is greater than or less than said display area.

223. The host server of claim 222, wherein the processor is further operative with the program to transmit a reformatted first web page to said user for display in said first lens, wherein substantially all of said display data can be viewed within said display area without using a horizontal scroll bar or a vertical scroll bar.

224. The host server of claim 222, wherein the processor is further operative with the program to transmit said first web page reformatted to a percentage of its original size selected by said user.

225. A remote device for receiving web content from a host server, comprising:

a storage device; and

a processor connected to the storage device,

the storage device storing a program for controlling the processor;

the processor operative with the program to,

receive display information including at least one lens presented within a window of a browser on said remote device, wherein each lens controls server-side web browsing.

226. The remote device of claim 225, wherein the processor is further operative with the program to:

transmit a uniform resource locator through a first lens; and

receive a web page corresponding to said uniform resource

locator displayed in said first lens.

227. The remote device of claim 225, wherein said at least one lens comprises four lenses.

228. The remote device of claim 225, wherein each lens has at least one navigational control.

229. The remote device of claim 228, wherein said navigational control comprises at least one of a uniform resource locator entry field, a horizontal scroll bar, a vertical scroll bar, a minimize command button, a maximize command button, a close lens command button, a forward command button, a backward command button, a bookmark command button, a reformat command button and a menu command button.

230. The remote device of claim 225, wherein each lens has full browser control capability.

231. The remote device of claim 225, wherein a first lens controls the web content displayed in a second lens.

232. The remote device of claim 225, wherein each lens is operative to present web page display data for any uniform resource locator received.

233. The remote device of claim 225, wherein the processor is further operative with the program to receive a login page comprising a user identifier field, prior to receiving said display information.

234. The remote device of claim 233, wherein the processor is further operative with the program to transmit a user identifier.

235. The remote device of claim 234, wherein said user identifier comprises an identification code and a password.

236. The remote device of claim 226, wherein the processor is further operative with the program to transmit a single command to bookmark said web page.

237. The remote device of claim 236, wherein said single command is transmitted through a bookmark command button associated with said first lens.

238. The remote device of claim 226, wherein the processor is further operative with the program to receive said web page such that only a portion of display data associated with said web page is viewed within a display area of said first lens without using a horizontal scroll bar or a vertical scroll bar.

239. The remote device of claim 238, wherein the processor is further operative with the program to transmit a request to reformat said web page.

240. The remote device of claim 239, wherein the processor is further operative with the program to receive a reformatted web page displayed in said first lens, wherein substantially all of said display data is viewed within said display area without using said horizontal scroll bar.

241. The remote device of claim 239, wherein the processor is further operative with the program to receive said web page reformatted to a percentage of its original size selected by a user.

242. The remote device of claim 226, wherein said web page is reformatted such that substantially all of said web page display data is viewed within a display area of said first lens without using a horizontal scroll bar or a vertical scroll bar.

243. The remote device of claim 225, wherein said web is reformatted to a percentage of its original size selected by a user.

244. A remote device for receiving web content from a host server, comprising:

a storage device; and

a processor connected to the storage device,

the storage device storing a program for controlling the processor;

the processor operative with the program to,

(i) receive display information including at least two lenses presented within a window of a browser on said remote device, wherein each lens controls server-side web browsing;

(ii) transmit a first uniform resource locator through a first lens; and

(iii) receive a first web page corresponding to said first uniform resource locator displayed in said first lens.

245. The remote device of claim 244, wherein the processor is further operative with the program to:

transmit a second uniform resource locator through a second lens; and

receive a second web page corresponding to said second uniform resource locator displayed in said second lens.

246. The remote device of claim 244, wherein said at least two lenses comprises four lenses.

247. The remote device of claim 244, wherein each lens has at least one navigational control.

248. The remote device of claim 247, wherein said navigational control comprises at least one of a uniform resource locator entry field, a horizontal scroll bar, a vertical scroll bar, a minimize command button, a maximize command button, a close lens command button, a forward command button, a backward command button, a bookmark command button, a reformat command button and a

menu command button.

249. The remote device of claim 244, wherein each lens has full browser control capability.

250. The remote device of claim 244, wherein a first lens controls the web content displayed in a second lens.

251. The remote device of claim 244, wherein each lens is operative to present web page display data for any uniform resource locator received.

252. The remote device of claim 244, wherein the processor is further operative with the program to receive a login page comprising a user identifier field, prior to receiving said display information.

253. The remote device of claim 252, wherein the processor is further operative with the program to transmit a user identifier.

254. The remote device of claim 253, wherein said user identifier comprises an identification code and a password.

255. The remote device of claim 244, wherein the processor is further operative with the program to transmit a single command to bookmark said first web page.

256. The remote device of claim 255, wherein said single command is transmitted through a bookmark command button associated with said first lens.

257. The remote device of claim 244, wherein said first web page is received such that only a portion of display data associated with said first web page is viewed within a display area of said first lens without using a horizontal scroll bar or a vertical scroll bar.

258. The remote device of claim 257, wherein the processor is further operative with the program to transmit a request to reformat said first web page.

259. The remote device of claim 258, wherein the processor is further operative with the program to receive a reformatted first web page displayed in said first lens, wherein substantially all of said display data is viewed within said display area without using said horizontal scroll bar or said vertical scroll bar.

260. The remote device of claim 258, wherein the processor is further operative with the program to receive said first web page reformatted to a percentage of its original size selected by a user.

261. The remote device of claim 244, wherein said first web page is reformatted such that substantially all of said first web page display data is viewed within a display area of said first lens without using a horizontal scroll bar or a vertical bar.

262. The remote device of claim 244, wherein said first web page is reformatted to a percentage of its original size selected by a user.

263. A remote device for receiving web content from a host server, comprising:

a storage device; and

a processor connected to the storage device,

the storage device storing a program for controlling the processor;

the processor operative with the program to,

(i) transmit an identifier to said host server; and

(ii) receive display information including a plurality of lenses presented within a window of a browser on said remote device, wherein each lens controls server-side web browsing and is operative to display a separate web page after

transmission of a uniform resource locator to said host server.

264. The remote device of claim 263, wherein the processor is further operative with the program to:

transmit a first uniform resource locator through a first lens; and

receive a first web page corresponding to said first uniform resource locator displayed in said first lens.

265. The remote device of claim 263, wherein said plurality of lenses comprises four lenses.

266. The remote device of claim 263, wherein each lens has at least one navigational control.

267. The remote device of claim 266, wherein said navigational control comprises at least one of a uniform resource locator entry field, a horizontal scroll bar, a vertical scroll bar, a minimize command button, a maximize command button, a close lens command button, a forward command button, a backward command button, a bookmark command button, a reformat command button and a menu command button.

268. The remote device of claim 263, wherein each lens has full browser control capability.

269. The remote device of claim 263, wherein a first lens controls the web content displayed in a second lens.

270. The remote device of claim 263, wherein each lens is operative to present web page display data for any uniform resource locator received.

271. The remote device of claim 263, wherein the processor is further operative with the program to receive a login page comprising a user identifier field, prior to receiving said display information.

272. The remote device of claim 271, wherein the processor is further operative with the program to transmit a user identifier.

273. The remote device of claim 272, wherein said user identifier comprises an identification code and a password.

274. The remote device of claim 264, wherein the processor is further operative with the program to transmit a single command to bookmark said first web page.

275. The remote device of claim 274, wherein said single command is transmitted through a bookmark command button associated with said first lens.

276. The remote device of claim 264, wherein the processor is further operative with the program to receive said first web page such that only a portion of display data associated with said first web page is viewed within a display area of said first lens without using a horizontal scroll bar or a vertical scroll bar.

277. The remote device of claim 276, wherein the processor is further operative with the program to transmit a request to reformat said first web page.

278. The remote device of claim 277, wherein the processor is further operative with the program to receive a reformatted first web page displayed in said first lens, wherein substantially all of said display data is viewed within said display area without using a horizontal scroll bar or a vertical scroll bar.

279. The remote device of claim 278, wherein the processor is further operative with the program to receive said first web page reformatted to a percentage of its original size selected by a user.

280. The remote device of claim 264, wherein said first web page is

reformatted such that substantially all of said first web page display data is viewed within a display area of said first lens without using a horizontal scroll bar or a vertical scroll bar.

281. The remote device of claim 264, wherein said first web page is reformatted to a percentage its original size selected by a user.

282. A host server for bookmarking a web page presented to a user at a remote device, comprising:

a storage device; and

a processor connected to the storage device,

the storage device storing a program for controlling the processor;

the processor operative with the program to,

(i) receive a uniform resource locator transmitted by said user through a window of a browser on said remote device;

(ii) transmit a web page corresponding to said uniform resource locator for display in said window;

(iii) receive a single command from said user to bookmark said web page; and

(iv) store a bookmark identifier corresponding to said web page.

283. The host server of claim 282, wherein said single command is received through a bookmark command button associated with said window.

284. A remote device for bookmarking a web page received by a user from a host server, comprising:

a storage device; and

a processor connected to the storage device,

the storage device storing a program for controlling the processor;

the processor operative with the program to,

(i) transmit a uniform resource locator to said host server through a window of a browser on said remote device;

(ii) receive a web page corresponding to said uniform resource locator displayed in said window; and

(iii) transmit a single command to bookmark said web page.

285. The remote device of claim 284, wherein said single command is transmitted through a bookmark command button associated with said window.

286. A host server for reformatting a web page presented to a user at a remote device, comprising:

a storage device; and

a processor connected to the storage device,

the storage device storing a program for controlling the processor;

the processor operative with the program to,

(i) receive a uniform resource locator through a window of a browser on said remote device;

(ii) transmit a web page corresponding to said uniform resource locator for display in said window, wherein only a portion of display data associated with said web page is visible within a display area of said window;

(iii) receive a request from said user to reformat said web page; and

(iv) reformat said web page in response to said request.

287. The host server of claim 286, wherein the processor is further operative with the program to transmit a reformatted web page to said user for display in said window, wherein substantially all of said display data is visible within said display area.

288. The host server of claim 286, wherein the processor is further operative with the program to transmit said web page reformatted to a percentage of its original size selected by said user.

289. A remote device for receiving a reformatted a web page from a host server, comprising:

a storage device; and

a processor connected to the storage device,

the storage device storing a program for controlling the processor;

the processor operative with the program to,

(i) transmit a uniform resource locator to said host server through a window of a browser on said remote device;

(ii) receive a web page corresponding to said uniform resource locator displayed in said window, wherein only a portion of display data associated with said web page is visible within a display area of said window; and

(iii) transmit a request to reformat said web page.

290. The remote device of claim 289, wherein the processor is further operative with the program to receive a reformatted web page in response to said request, wherein substantially all of said display data is visible within said display area.

291. The remote device of claim 289, wherein the processor is further operative with the program to receive said web page reformatted to a percentage of its original size selected by a user.

292. A host server for reformatting a web page presented to a user at a remote device, comprising:

a storage device; and

a processor connected to the storage device,

the storage device storing a program for controlling the processor;

the processor operative with the program to,

(i) receive display data corresponding to a web page requested by said user;

(ii) determine whether said display data has a size greater than or less than a display area available for viewing said web page; and

(iii) reformat said web page if said size of said display data is greater than or less than said display area.

293. The host server of claim 292, wherein the processor is further operative with the program to transmit a reformatted web page to said user for display in said display area, wherein substantially all of said display data is visible within said display area.

294. The host server of claim 292, wherein the processor is further operative with the program to transmit said web page reformatted to a percentage of its original size selected by said user.

295. A remote device for receiving a reformatted web page from a host server, comprising:

a storage device; and

a processor connected to the storage device,

the storage device storing a program for controlling the processor;

the processor operative with the program to,

(i) request said host server to transmit a web page for presentation in a display area of a window of a browser on said remote device; and

(ii) receive from said host server a reformatted web page in response to said request, wherein substantially all of said web page is visible within said display area of said

window.

296. A remote device for receiving a reformatted web page from a host server, comprising:

a storage device; and

a processor connected to the storage device,

the storage device storing a program for controlling the processor;

the processor operative with the program to,

(i) request said host server to transmit a web page for presentation in a display area of a window of a browser on said remote device; and

(ii) receive from said host server said web page reformatted to a percentage of its original size selected by a user.

297. A computer readable medium having computer executable software code stored thereon for presenting, through a host server, web content to a user at a remote device, comprising:

code for transmitting display information including at least one lens for presentation within a window of a browser on said remote device, wherein each lens controls server-side web browsing.

298. The computer readable medium of claim 297, further comprising:

code for receiving a uniform resource locator through a first lens; and

code for transmitting a web page corresponding to said uniform resource locator for display in said first lens.

299. The computer readable medium of claim 298, further comprising code for receiving web page display data corresponding to said web page from a second server.

300. The computer readable medium of claim 299, further comprising:

code for receiving said web page display data in a first language; and

code for translating said web page display data into a second language prior to transmission for display on said remote device.

301. The computer readable medium of claim 300, wherein said first language comprises at least one of hypertext markup language, cascading style sheet language, extensible markup language, extensible style sheet language, extensible hypertext markup language and wireless markup language.

302. The computer readable medium of claim 300, wherein said second language comprises at least one of hypertext markup language and wireless markup language.

303. The computer readable medium of claim 297, wherein said at least one lens comprises four lenses.

304. The computer readable medium of claim 297, wherein each lens has at least one navigational control.

305. The computer readable medium of claim 304, wherein said navigational control comprises at least one of a uniform resource locator entry field, a horizontal scroll bar, a vertical scroll bar, a minimize command button, a maximize command button, a close lens command button, a forward command button, a backward command button, a bookmark command button, a reformat command button and a menu command button.

306. The computer readable medium of claim 297, wherein each lens has full browser capability.

307. The computer readable medium of claim 297, wherein a first lens controls the web content displayed in a second lens.

308. The computer readable medium of claim 297, wherein each lens is operative to present web page display data for any uniform resource locator received.

309. The computer readable medium of claim 297, further comprising code for transmitting a login page comprising a user identifier field for display within said window, prior to transmitting said display information.

310. The computer readable medium of claim 309, further comprising:

code for receiving a user identifier; and

code for verifying said user identifier.

311. The computer readable medium of claim 310, wherein said user identifier comprises an identification code and a password.

312. The computer readable medium of claim 298, further comprising:

code for receiving a single command to bookmark said web page; and

code for storing a bookmark identifier for said web page.

313. The computer readable medium of claim 312, wherein said single command is received through a bookmark command button associated with said first lens.

314. The computer readable medium of claim 297, further comprising code for storing at least one cookie associated with each lens.

315. The computer readable medium of claim 310, further

comprising code for storing at least one cookie associated with said user identifier.

316. The computer readable medium of claim 298, wherein said web page is transmitted such that only a portion of display data associated with said web page can be viewed within a display area of said first lens without using a horizontal scroll bar or a vertical scroll bar.

317. The computer readable medium of claim 316, further comprising code for receiving a request from said user to reformat said web page.

318. The computer readable medium of claim 317, further comprising code for reformatting said web page in response to said request such that substantially all of said display data can be viewed within said display area without using said horizontal scroll bar or said vertical scroll bar.

319. The computer readable medium of claim 317, further comprising code for reformatting said web page to a percentage of its original size selected by said user.

320. The computer readable medium of claim 298, further comprising:

code for receiving display data corresponding to said web page;

code for determining whether said display data has a size greater than or less than a display area of said first lens; and

code for reformatting said web page if said size of said display data is greater than or less than said display area.

321. The computer readable medium of claim 320, further comprising code for reformatting said web page such that substantially all of said display data can be viewed within said display area without using a horizontal scroll bar or a vertical scroll bar.

322. The computer readable medium of claim 320, further comprising code for reformatting said web page to a percentage of its original size selected by said user.

323. A computer readable medium having computer executable software code stored thereon for presenting, through a host server, web content to a user at a remote device, comprising:

code for transmitting display information including at least two lenses for presentation within a window of a browser on said remote device, wherein each lens controls server side web browsing;

code for receiving a first uniform resource locator through a first lens; and

code for transmitting a first web page corresponding to said first uniform resource locator for display in said first lens.

324. The computer readable medium of claim 323, further comprising:

code for receiving a second uniform resource locator through a second lens; and

code for transmitting a second web page corresponding to said second uniform resource locator for display in said second lens.

325. The computer readable medium of claim 323, further comprising code for receiving web page display data corresponding to said first web page from a second server.

326. The computer readable medium of claim 325, further comprising:

code for receiving said web page display data in a first language; and

code for translating said web page display data into a second language prior to transmission for display on said remote device.

327. The computer readable medium of claim 326, wherein said first language comprises at least one of hypertext markup language, cascading style sheet language, extensible markup language, extensible style sheet language, extensible hypertext markup language and wireless markup language.

328. The computer readable medium of claim 326, wherein said second language comprises at least one of hypertext markup language and wireless markup language.

329. The computer readable medium of claim 323, wherein said at least two lenses comprises four lenses.

330. The computer readable medium of claim 323, wherein each lens has at least one navigational control.

331. The computer readable medium of claim 330, wherein said navigational control comprises at least one of a uniform resource locator entry field, a horizontal scroll bar, a vertical scroll bar, a minimize command button, a maximize command button, a close lens command button, a forward command button, a backward command button, a bookmark command button, a reformat command button and a menu command button.

332. The computer readable medium of claim 323, wherein each lens has full browser control capability.

333. The computer readable medium of claim 323, wherein a first lens controls the web content displayed in a second lens.

334. The computer readable medium of claim 323, wherein each lens is operative to present web page display data for any uniform resource locator received.

335. The computer readable medium of claim 323, further

comprising code for transmitting a login page comprising a user identifier field for display within said window, prior to transmitting said display information.

336. The computer readable medium of claim 335, further comprising:

code for receiving a user identifier; and

code for verifying the user identifier.

337. The computer readable medium of claim 336, wherein said user identifier comprises an identification code and a password.

338. The computer readable medium of claim 323, further comprising:

code for receiving a single command to bookmark said first web page; and

code for storing a bookmark identifier for said first web page.

339. The computer readable medium of claim 338, wherein said single command is received through a bookmark command button associated with said first lens.

340. The computer readable medium of claim 323, further comprising code for storing at least one cookie associated with each lens.

341. The computer readable medium of claim 336, further comprising code for storing at least one cookie associated with said user identifier.

342. The computer readable medium of claim 323, wherein said first web page is transmitted such that only a portion of display data associated with said first web page can be viewed within a display area of said first lens without using a horizontal scroll bar or a vertical scroll bar.

343. The computer readable medium of claim 342, further

comprising code for receiving a request from said user to reformat said first web page.

344. The computer readable medium of claim 343, further comprising code for reformatting said first web page in response to said request such that substantially all of said display data can be viewed within said display area without using said horizontal scroll bar or said vertical scroll bar.

345. The computer readable medium of claim 343, further comprising code for reformatting said first web page to a percentage of its original size selected by said user.

346. The computer readable medium of claim 323, further comprising:

code for receiving display data corresponding to said first web page;

code for determining whether said display data has a size greater than or less than a display area of said first lens; and

code for reformatting said first web page if said size of said display data is greater than or less than said display area.

347. The computer readable medium of claim 346, further comprising code for reformatting said first web page such that substantially all of said display data can be viewed within said display area without using a horizontal scroll bar or a vertical scroll bar.

348. The computer readable medium of claim 346, further comprising code for reformatting said first web page to a percentage of its original size selected by said user.

349. A computer readable medium having computer executable software code stored thereon for presenting, through a host server, web content to a user at a remote device, comprising:

code for receiving an identifier from said user;

code for verifying said identifier; and

code for transmitting display information to said user including a plurality of lenses for presentation within a window of a browser on said remote device, wherein each lens controls server-side web browsing and is operative to display a separate web page upon receiving a uniform resource locator from said user.

350. The computer readable medium of claim 349, further comprising:

code for receiving a first uniform resource locator through a first lens; and

code for transmitting a first web page corresponding to said first uniform resource locator for display in said first lens.

351. The computer readable medium of claim 350, further comprising code for receiving web page display data corresponding to said first web page from a second server.

352. The computer readable medium of claim 351, further comprising:

code for receiving said web page display data in a first language; and

code for translating said web page display data into a second language prior to transmission for display on said remote device.

353. The computer readable medium of claim 352, wherein said first language comprises at least one of hypertext markup language, cascading style sheet language, extensible markup language, extensible style sheet language, extensible hypertext markup language and wireless markup language.

354. The computer readable medium of claim 352, wherein said second language comprises at least one of hypertext markup language and wireless

markup language.

355. The computer readable medium of claim 349, wherein said plurality of lenses comprises four lenses.

356. The computer readable medium of claim 349, wherein each lens has at least one navigational control.

357. The computer readable medium of claim 356, wherein said navigational control comprises at least one of a uniform resource locator entry field, a horizontal scroll bar, a vertical scroll bar, a minimize command button, a maximize command button, a close lens command button, a forward command button, a backward command button, a bookmark command button, a reformat command button and a menu command button.

358. The computer readable medium of claim 349, wherein each lens has full browser control capability.

359. The computer readable medium of claim 349, wherein a first lens controls the web content displayed in a second lens.

360. The computer readable medium of claim 349, wherein each lens is operative to present web page display data for any uniform resource locator received.

361. The computer readable medium of claim 349, wherein said identifier comprises an identification code and a password.

362. The computer readable medium of claim 350, further comprising:

code for receiving a single command to bookmark said first web page; and

code for storing a bookmark identifier for said first web page.

363. The computer readable medium of claim 362, wherein said single command is received through a bookmark command button associated with said first lens.

364. The computer readable medium of claim 349, further comprising code for storing at least one cookie associated with each lens.

365. The computer readable medium of claim 349, further comprising code for storing at least one cookie associated with said user identifier.

366. The computer readable medium of claim 350, wherein said first web page is transmitted such that only a portion of display data associated with said first web page can be viewed within a display area of said first lens without using a horizontal scroll bar or a vertical scroll bar.

367. The computer readable medium of claim 366, further comprising code for receiving a request from said user to reformat said first web page.

368. The computer readable medium of claim 367, further comprising code for reformatting said first web page in response to said request such that substantially all of said display data can be viewed within said display area without using said horizontal scroll bar or said vertical scroll bar.

369. The computer readable medium of claim 367, further comprising code for reformatting said first web page to a percentage of its original size selected by said user.

370. The computer readable medium of claim 350, further comprising:

code for receiving display data corresponding to said first web page;

code for determining whether said display data has a size greater than or less than a display area of said first lens; and

code for reformatting said first web page if said size is greater than or less than said display area.

371. The computer readable medium of claim 370, further comprising code for reformatting said first web page such that substantially all of said display data can be viewed within said display area without using a horizontal scroll bar or a vertical scroll bar.

372. The computer readable medium of claim 370, further comprising code for reformatting said first web page to a percentage of its original size selected by said user.

373. A computer readable medium having computer executable software code stored thereon for receiving web content at a remote device, comprising:

code for receiving display information from a host server, the display information including at least one lens presented within a window of a browser on said remote device, wherein each lens controls server-side web browsing.

374. The computer readable medium of claim 373, further comprising:

code for transmitting a uniform resource locator through a first lens; and

code for receiving a web page corresponding to said uniform resource locator displayed in said first lens.

375. The computer readable medium of claim 373, wherein said at least one lens comprises four lenses.

376. The computer readable medium of claim 373, wherein each

lens has at least one navigational control.

377. The computer readable medium of claim 376, wherein said navigational control comprises at least one of a uniform resource locator entry field, a horizontal scroll bar, a vertical scroll bar, a minimize command button, a maximize command button, a close lens command button, a forward command button, a backward command button, a bookmark command button, a reformat command button and a menu command button.

378. The computer readable medium of claim 373, wherein each lens has full browser control capability.

379. The computer readable medium of claim 373, wherein a first lens controls the web content displayed in a second lens.

380. The computer readable medium of claim 373, wherein each lens is operative to present web page display data for any uniform resource locator received.

381. The computer readable medium of claim 373, further comprising code for receiving a login page comprising a user identifier field prior to receiving said display information.

382. The computer readable medium of claim 381, further comprising code for transmitting a user identifier.

383. The computer readable medium of claim 382, wherein said user identifier comprises an identification code and a password.

384. The computer readable medium of claim 374, further comprising code for transmitting a single command to bookmark said web page.

385. The computer readable medium of claim 384, wherein said

single command is transmitted through a bookmark command button associated with said first lens.

386. The computer readable medium of claim 374, wherein said web page is received such that only a portion of display data associated with said web page is viewed within a display area of said first lens without using a horizontal scroll bar or a vertical scroll bar.

387. The computer readable medium of claim 386, further comprising code for transmitting a request to reformat said web page.

388. The computer readable medium of claim 387, further comprising code for receiving a reformatted web page displayed in said first lens, wherein substantially all of said display data is viewed within said display area without using said horizontal scroll bar.

389. The computer readable medium of claim 387, further comprising code for receiving said web page reformatted to a percentage of its original size selected by a user.

390. The computer readable medium of claim 374, wherein said web page is reformatted such that substantially all of said web page display data is viewed within a display area of said first lens without using a horizontal scroll bar or a vertical scroll bar.

391. The computer readable medium of claim 374, wherein said web page is reformatted to a percentage of its original size selected by a user.

392. A computer readable medium having computer executable software code stored thereon for receiving web content at a remote device, comprising:

code for receiving display information from a host server, the display information including at least two lenses presented within a

window of a browser on said remote device, wherein each lens controls server-side web browsing;

code for transmitting a first uniform resource locator through a first lens; and

code for receiving a first web page corresponding to said first uniform resource locator displayed in said first lens.

393. The computer readable medium of claim 392, further comprising:

code for transmitting a second uniform resource locator through a second lens; and

code for receiving a second web page corresponding to said second uniform resource locator displayed in said second lens.

394. The computer readable medium of claim 392, wherein said at least two lenses comprises four lenses.

395. The computer readable medium of claim 392, wherein each lens has at least one navigational control.

396. The computer readable medium of claim 395, wherein said navigational control comprises at least one of a uniform resource locator entry field, a horizontal scroll bar, a vertical scroll bar, a minimize command button, a maximize command button, a close lens command button, a forward command button, a backward command button, a bookmark command button, a reformat command button and a menu command button.

397. The computer readable medium of claim 392, wherein each lens has full browser control capability.

398. The computer readable medium of claim 392, wherein a first lens controls the web content displayed in a second lens.

399. The computer readable medium of claim 392, wherein each lens is operative to present web page display data for any uniform resource locator received.

400. The computer readable medium of claim 392, further comprising code for receiving a login page comprising a user identifier field, prior to receiving said display information.

401. The computer readable medium of claim 400, further comprising code for transmitting a user identifier.

402. The computer readable medium of claim 401, wherein said user identifier comprises an identification code and a password.

403. The computer readable medium of claim 392, further comprising code for transmitting a single command to bookmark said first web page.

404. The computer readable medium of claim 403, wherein said single command is transmitted through a bookmark command button associated with said first lens.

405. The computer readable medium of claim 392, wherein said first web page is received such that only a portion of display data associated with said first web page is viewed within a display area of said first lens without using a horizontal scroll bar or a vertical scroll bar.

406. The computer readable medium of claim 405, further comprising code for transmitting a request to reformat said first web page.

407. The computer readable medium of claim 406, further comprising code for receiving a reformatted first web page displayed in said first lens, wherein substantially all of said display data is viewed within said display area without using said horizontal scroll bar or said vertical scroll bar.

408. The computer readable medium of claim 406, further comprising code for receiving said first web page reformatted to a percentage of its original size selected by a user.

409. The computer readable medium of claim 392, wherein said first web page is reformatted such that substantially all of said first web page display data is viewed within a display area of said first lens without using a horizontal scroll bar or a vertical scroll bar.

410. The computer readable medium of claim 392, wherein said first web page is reformatted to a percentage of a display area of its original size selected by a user.

411. A computer readable medium having computer executable software code stored thereon for receiving web content at a remote device, comprising:

code for transmitting an identifier to a host server; and

code for receiving display information from said host server, the display information including a plurality of lenses for presentation within a window of a browser on said remote device, wherein each lens controls server-side web browsing and is operative to display a separate web page after transmission of a uniform resource locator to said host server.

412. The computer readable medium of claim 411, further comprising:

code for transmitting a first uniform resource locator through a first lens; and

code for receiving a first web page corresponding to said first uniform resource locator displayed in said first lens.

413. The computer readable medium of claim 411, wherein said

plurality of lenses comprises four lenses.

414. The computer readable medium of claim 411, wherein each lens has at least one navigational control.

415. The computer readable medium of claim 414, wherein said navigational control comprises at least one of a uniform resource locator entry field, a horizontal scroll bar, a vertical scroll bar, a minimize command button, a maximize command button, a close lens command button, a forward command button, a backward command button, a bookmark command button, a reformat command button and a menu command button.

416. The computer readable medium of claim 411, wherein each lens has full browser control capability.

417. The computer readable medium of claim 411, wherein a first lens controls the web content displayed in a second lens.

418. The computer readable medium of claim 411, wherein each lens is operative to present web page display data for any uniform resource locator received.

419. The computer readable medium of claim 411, further comprising code for receiving a login page comprising a user identifier field, prior to receiving said display information.

420. The computer readable medium of claim 419, further comprising code for transmitting a user identifier.

421. The computer readable medium of claim 420, wherein said user identifier comprises an identification code and a password.

422. The computer readable medium of claim 412, further

comprising code for transmitting a single command to bookmark said first web page.

423. The computer readable medium of claim 422, wherein said single command is transmitted through a bookmark command button associated with said first lens.

424. The computer readable medium of claim 412, wherein said first web page is received such that only a portion of display data associated with said first web page is viewed within a display area of said first lens without using a horizontal scroll bar or a vertical scroll bar.

425. The computer readable medium of claim 424, further comprising code for transmitting a request to reformat said first web page.

426. The computer readable medium of claim 425, further comprising code for receiving a reformatted first web page displayed in said first lens, wherein substantially all of said display data is viewed within said display area without using said horizontal scroll bar or said vertical scroll bar.

427. The computer readable medium of claim 425, further comprising receiving said first web page reformatted to a percentage of its original size selected by a user.

428. The computer readable medium of claim 412, wherein said first web page is reformatted such that substantially all of said first web page display data is viewed within a display area of said first lens without using a horizontal scroll bar or a vertical scroll bar.

429. The computer readable medium of claim 412, wherein said first web page is reformatted to a percentage of its original size selected by a user.

430. A computer readable medium having computer executable software code stored thereon for bookmarking a web page presented by a host server

to a user at a remote device, comprising:

code for receiving a uniform resource locator transmitted by said user through a window of a browser on said remote device;

code for transmitting a web page corresponding to said uniform resource locator for display in said window;

code for receiving a single command from said user to bookmark said web page; and

code for storing a bookmark identifier corresponding to said web page.

431. The computer readable medium of claim 430, wherein said single command is received through a bookmark command button associated with said window.

432. A computer readable medium having computer executable software code stored thereon for bookmarking a web page received by a user on a remote device, comprising:

code for transmitting a uniform resource locator to a host server through a window of a browser on said remote device;

code for receiving a web page corresponding to said uniform resource locator displayed in said window; and

code for transmitting a single command to bookmark said web page.

433. The computer readable medium of claim 432, wherein said single command is transmitted through a bookmark command button associated with said window.

434. A computer readable medium having computer executable software code stored thereon for reformatting a web page presented by a host server to a user at a remote device, comprising:

code for receiving a uniform resource locator through a window of a browser on said remote device;

code for transmitting a web page corresponding to said uniform resource locator for display in said window, wherein only a portion of display data associated with said web page is visible within a display area of said window; and

code for receiving a request from said user to reformat said web page.

435. The computer readable medium of claim 434, further comprising code for reformatting said web page in response to said request such that substantially all of said display data is visible within said display area.

436. The computer readable medium of claim 434, further comprising code for reformatting said web page to a percentage of its original size selected by said user.

437. A computer readable medium having computer executable software code stored thereon for reformatting a web page received on a remote device, comprising:

code for transmitting a uniform resource locator to a host server through a window of a browser on said remote device;

code for receiving a web page corresponding to said uniform resource locator displayed in said window, wherein only a portion of display data associated with said web page is viewed within a display area of said window; and

code for transmitting a request to reformat said web page.

438. The computer readable medium of claim 437, further comprising code for receiving a reformatted web page in response to said request, wherein substantially all of said display data is visible within said display area.

439. The computer readable medium of claim 437, further comprising code for receiving said web page reformatted to a percentage of its original size selected by a user.

440. A computer readable medium having computer executable software code stored thereon for reformatting a web page presented to a user at a remote device, comprising:

code for receiving display data corresponding to a web page requested by said user;

code for determining whether said display data has a size greater than or less than a display area available for displaying said web page; and

code for reformatting said web page if said size of said display data is greater than or less than said display area.

441. The computer readable medium of claim 440, further comprising code for reformatting said web page such that substantially all of said display data is visible within said display area.

442. The computer readable medium of claim 440, further comprising code for reformatting said web page to a percentage of its original size selected by said user.

443. A computer readable medium having computer executable software code stored thereon for receiving a reformatted web page on a remote device, comprising:

code for requesting a host server to transmit a web page for presentation in a display area within a window of a browser on said remote device; and

code for receiving from said host server a reformatted web page.

444. The computer readable medium of claim 443, wherein substantially all of said reformatted web page is visible within said display area.

445. The computer readable medium of claim 443, wherein said web page has been reformatted to a percentage of its original size selected by a user.

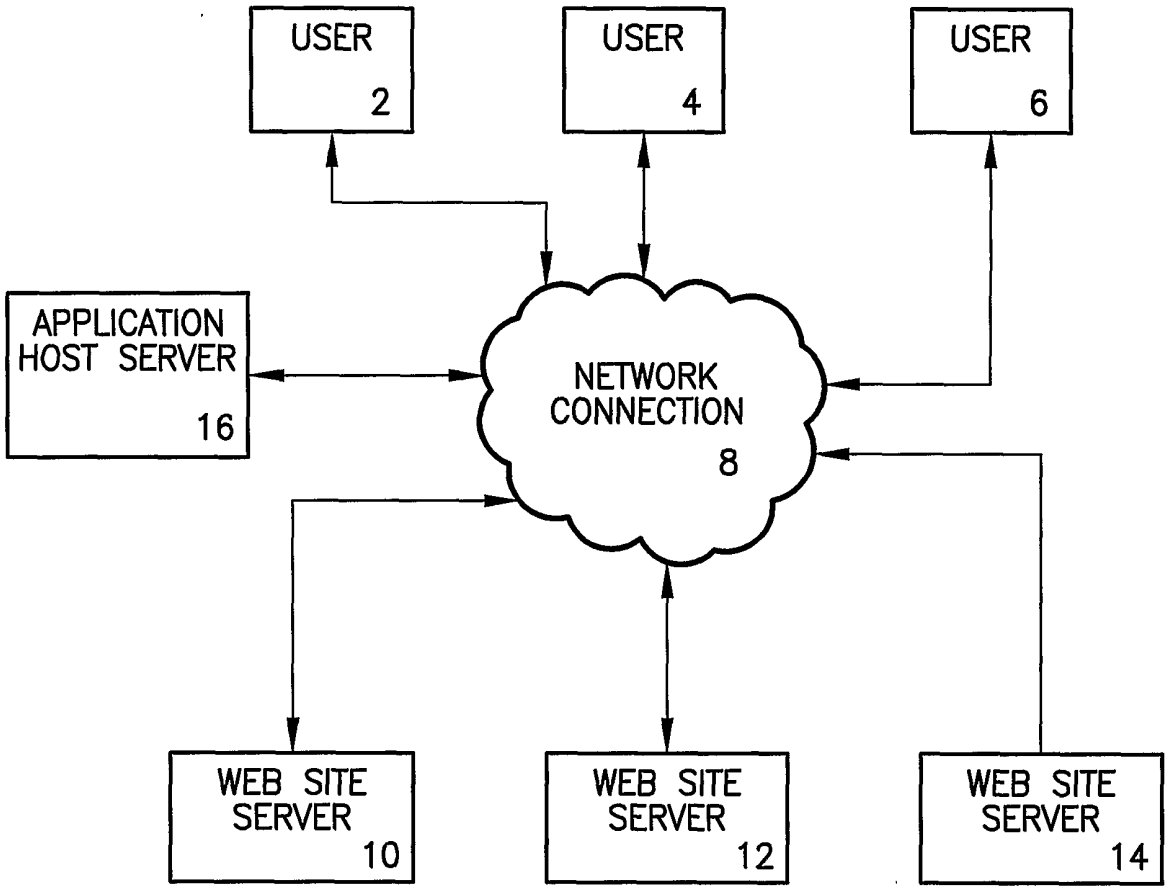
USER
2
USER
4
USER
6
APPLICATION
HOST SERVER
16
NETWORK
CONNECTION
8
WEB SITE
SERVER
10
WEB SITE
SERVER
12
WEB SITE
SERVER
14

Fig. 1

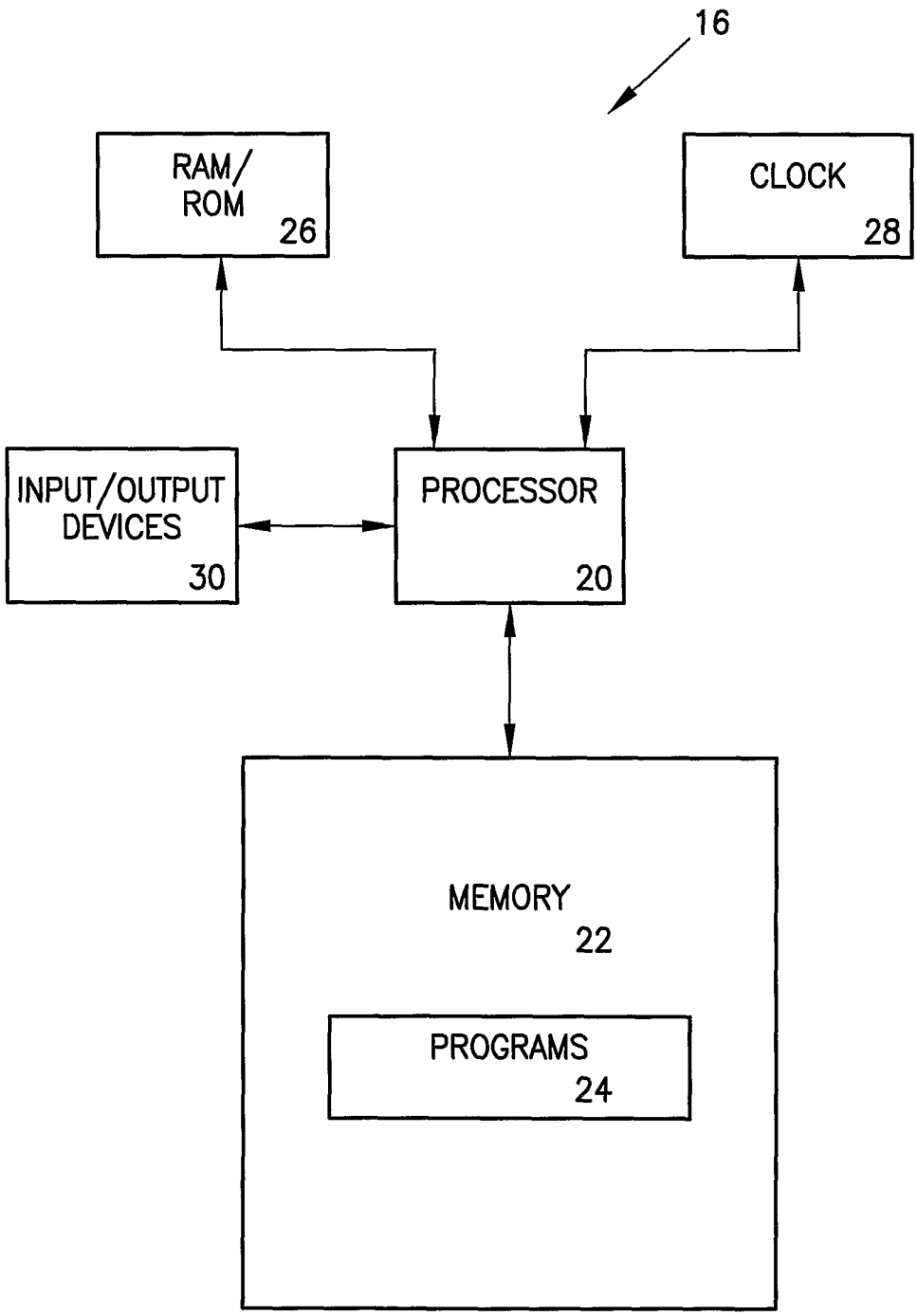
16
RAM/
ROM
26
CLOCK
28
INPUT/OUTPUT
DEVICES
30
PROCESSOR
20
MEMORY
22
PROGRAMS
24

Fig. 2

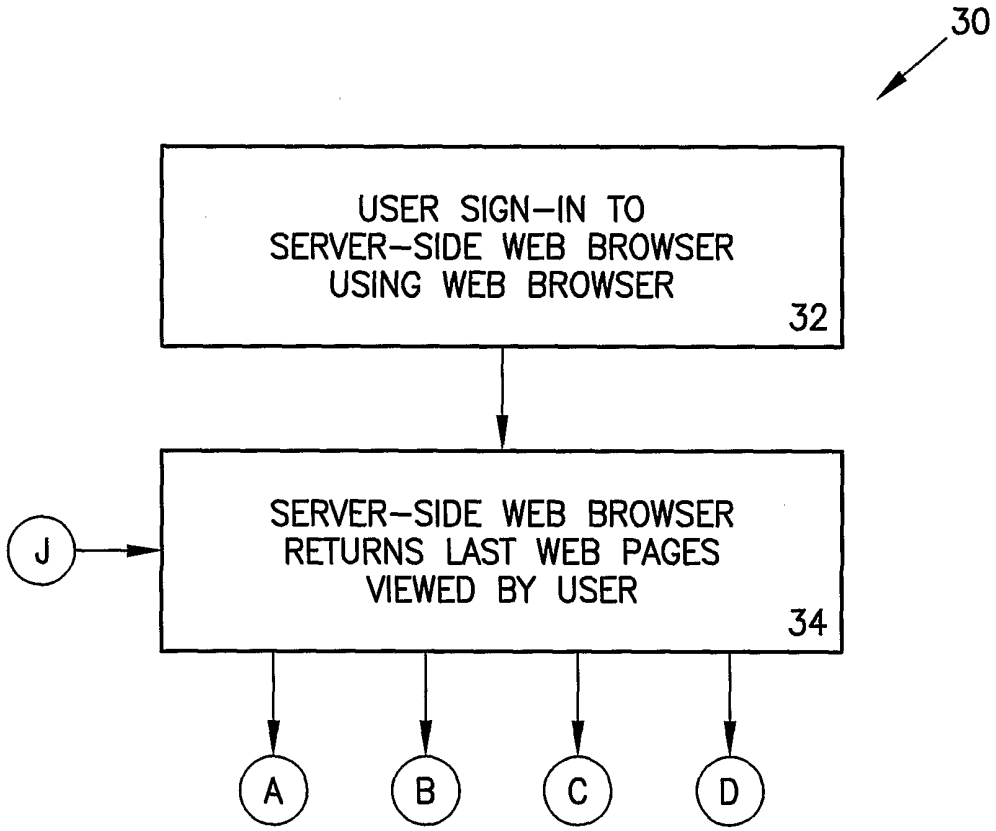
30
USER SIGN-IN TO SERVER-SIDE WEB BROWSER USING WEB BROWSER
32
SERVER-SIDE WEB BROWSER RETURNS LAST WEB PAGES VIEWED BY USER
34
J
A
B
C
D

Fig. 3

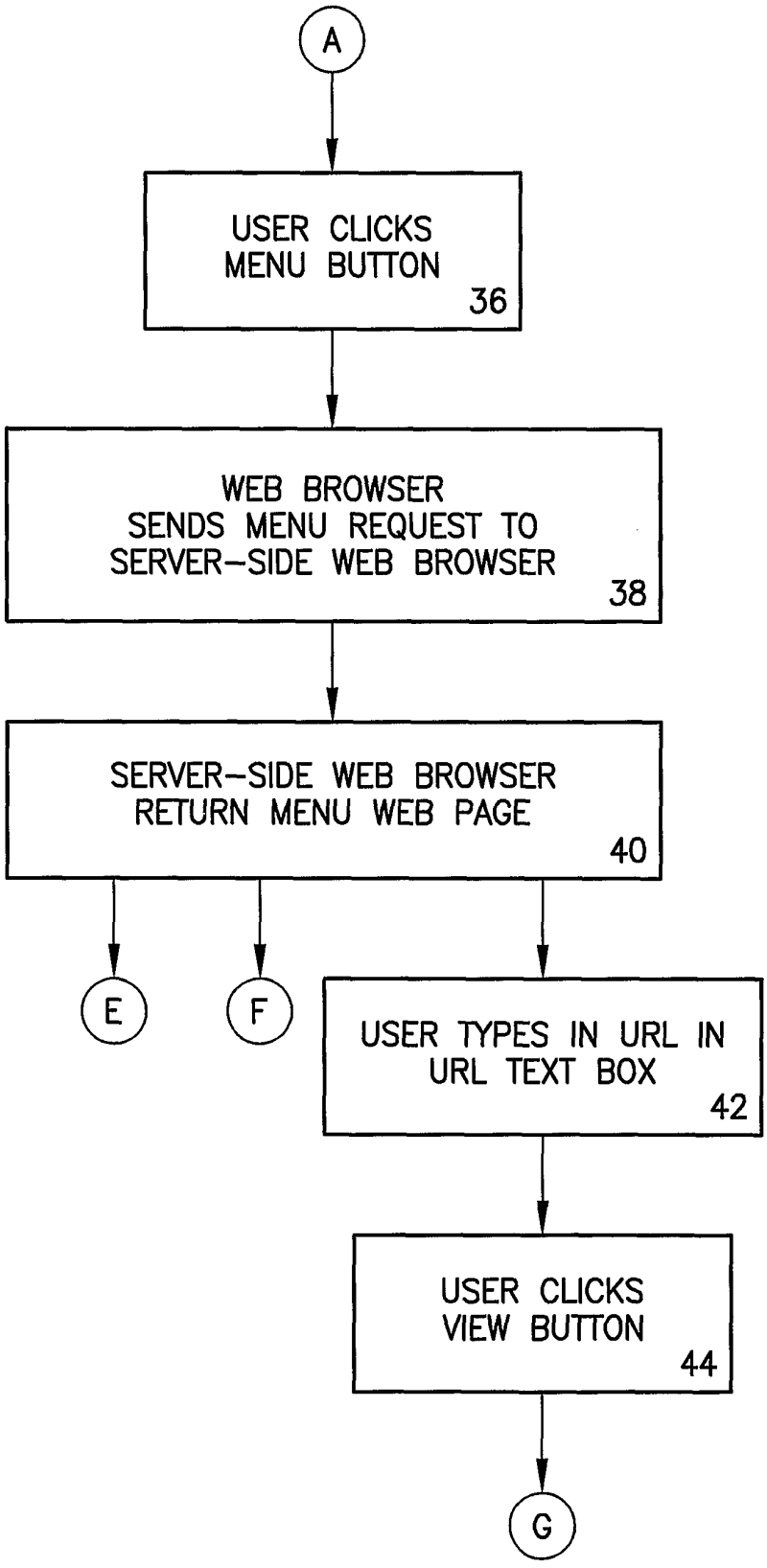
A
USER CLICKS MENU BUTTON
36
WEB BROWSER SENDS MENU REQUEST TO SERVER-SIDE WEB BROWSER
38
SERVER-SIDE WEB BROWSER RETURN MENU WEB PAGE
40
E
F
USER TYPES IN URL IN URL TEXT BOX
42
USER CLICKS VIEW BUTTON
44
G

Fig. 4

RECEIVED 18 JUN 2001

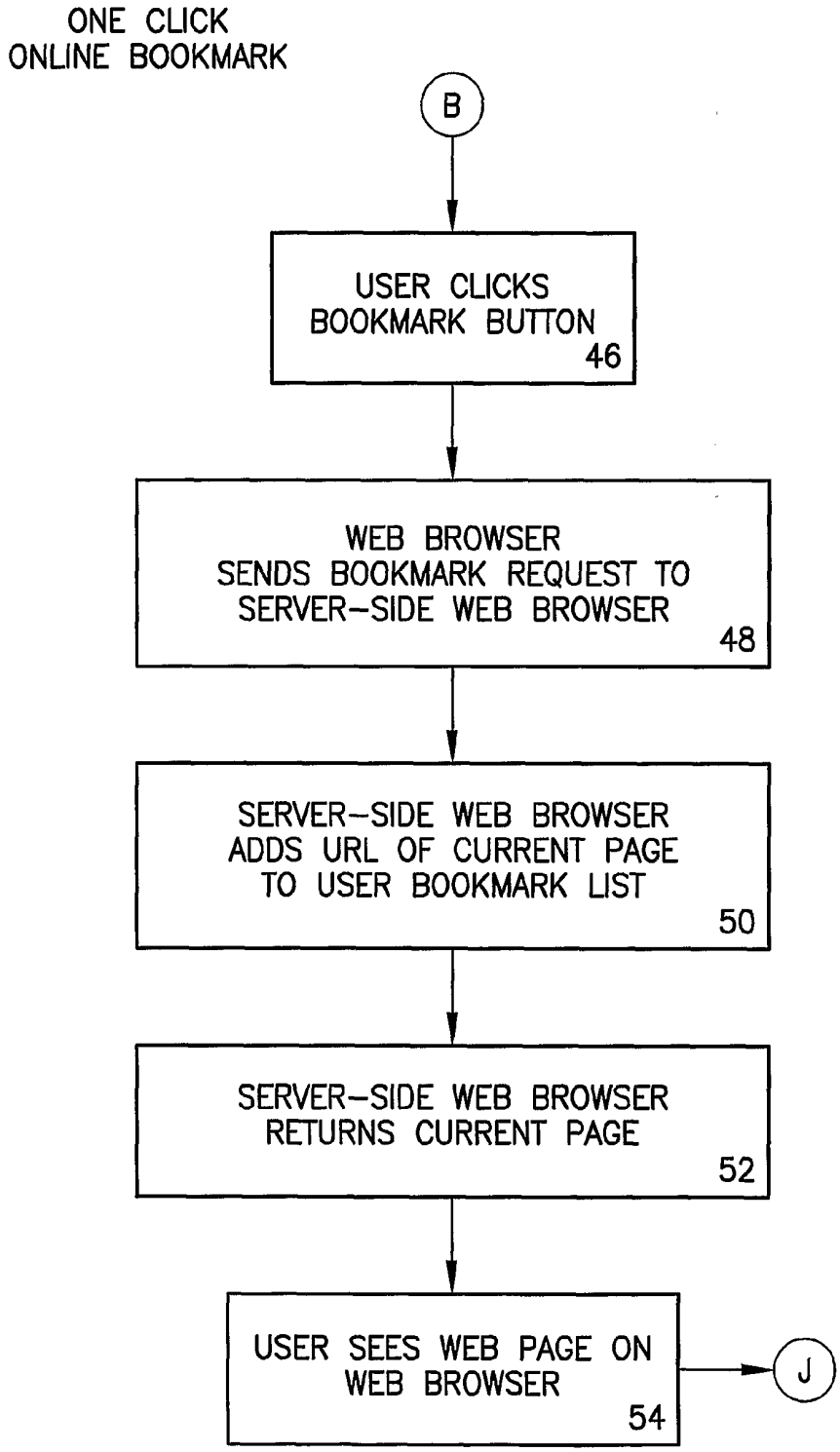

Fig. 5

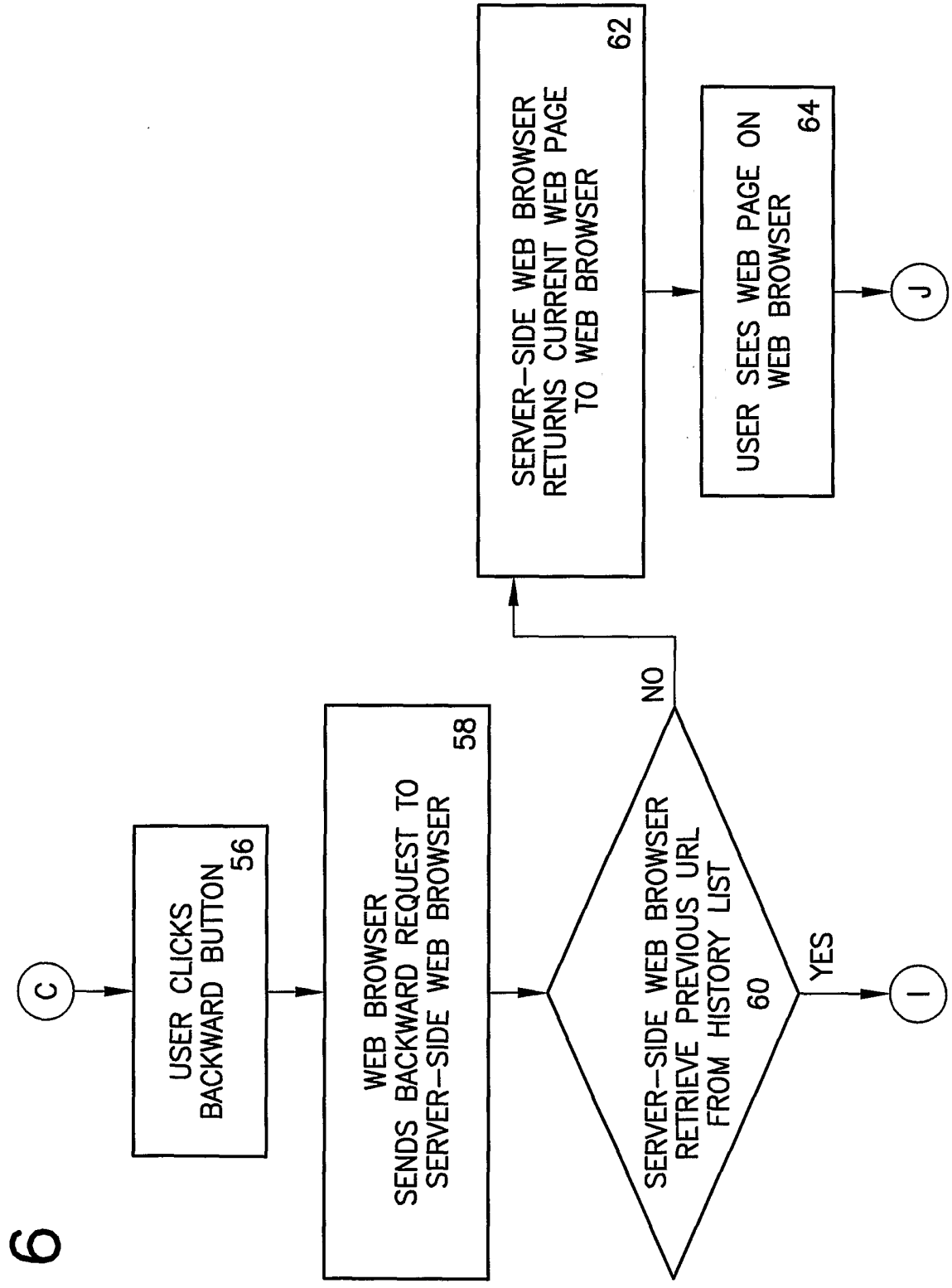
C
USER CLICKS BACKWARD BUTTON
56
WEB BROWSER SENDS BACKWARD REQUEST TO SERVER-SIDE WEB BROWSER
58
SERVER-SIDE WEB BROWSER RETRIEVE PREVIOUS URL FROM HISTORY LIST
60
NO
YES
I
SERVER-SIDE WEB BROWSER RETURNS CURRENT WEB PAGE TO WEB BROWSER
62
USER SEES WEB PAGE ON WEB BROWSER
64
J

Fig. 6

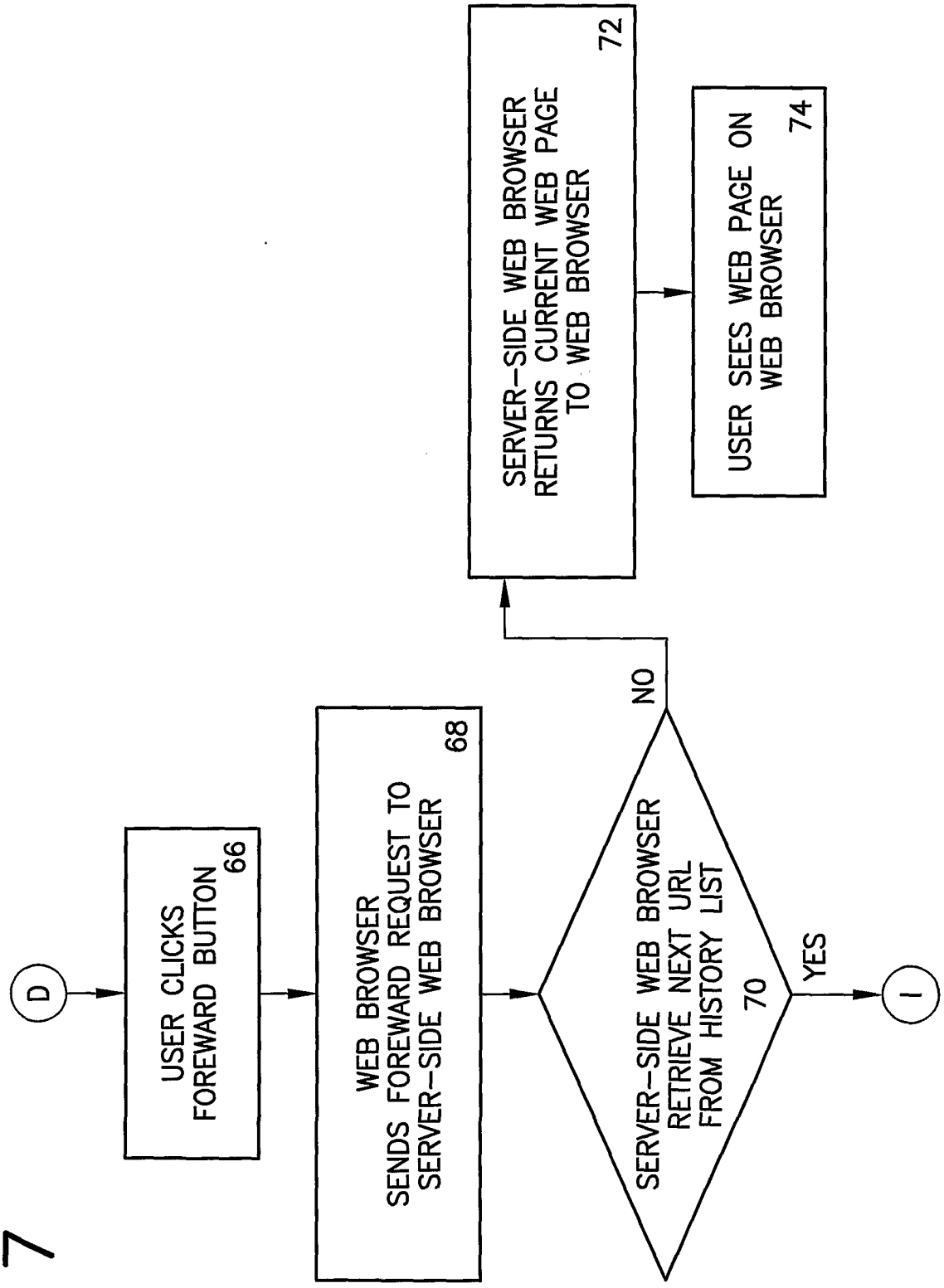
D
USER CLICKS FOREWARD BUTTON
66
WEB BROWSER SENDS FOREWARD REQUEST TO SERVER-SIDE WEB BROWSER
68
SERVER-SIDE WEB BROWSER RETRIEVE NEXT URL FROM HISTORY LIST
70
NO
YES
I
SERVER-SIDE WEB BROWSER RETURNS CURRENT WEB PAGE TO WEB BROWSER
72
USER SEES WEB PAGE ON WEB BROWSER
74

Fig. 7

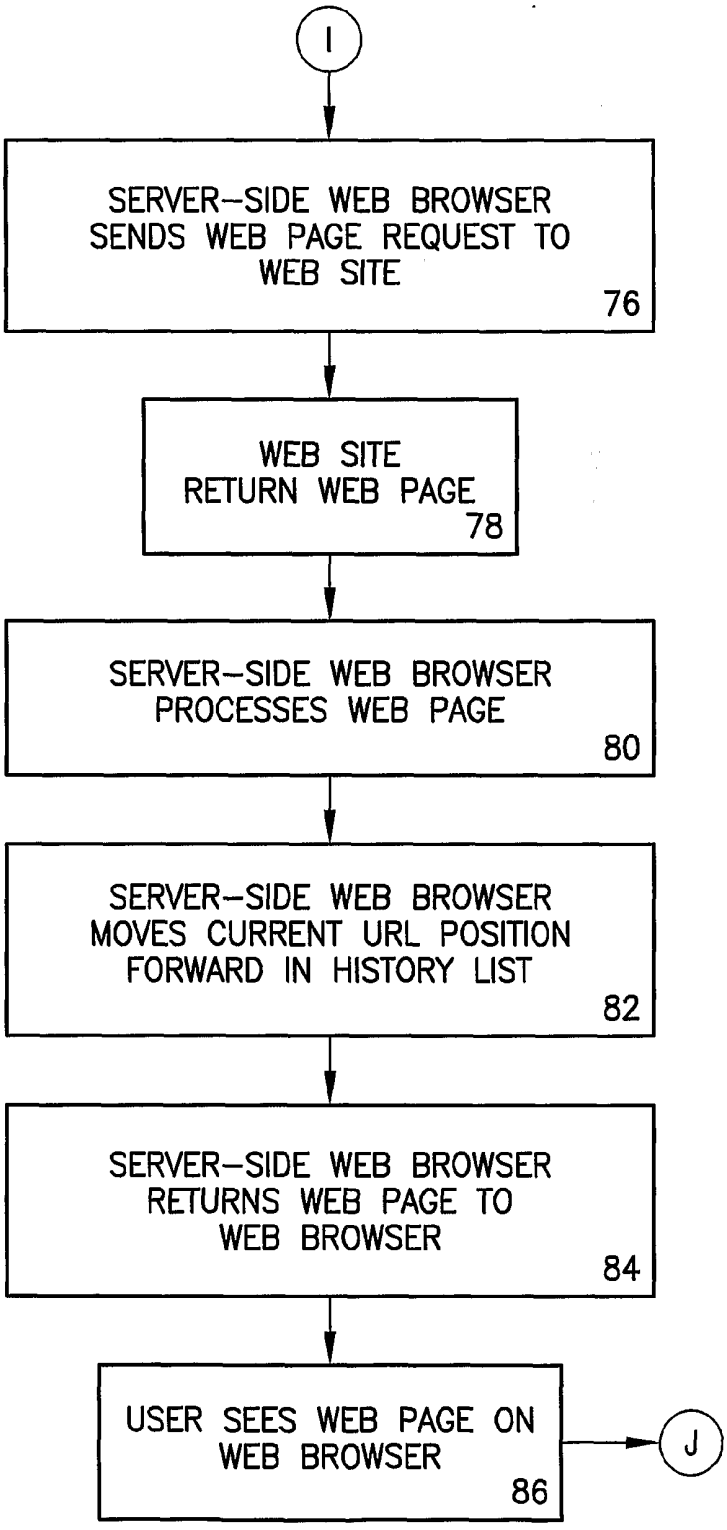
I
SERVER-SIDE WEB BROWSER SENDS WEB PAGE REQUEST TO WEB SITE
76
WEB SITE RETURN WEB PAGE
78
SERVER-SIDE WEB BROWSER PROCESSES WEB PAGE
80
SERVER-SIDE WEB BROWSER MOVES CURRENT URL POSITION FORWARD IN HISTORY LIST
82
SERVER-SIDE WEB BROWSER RETURNS WEB PAGE TO WEB BROWSER
84
USER SEES WEB PAGE ON WEB BROWSER
86
J

Fig. 8

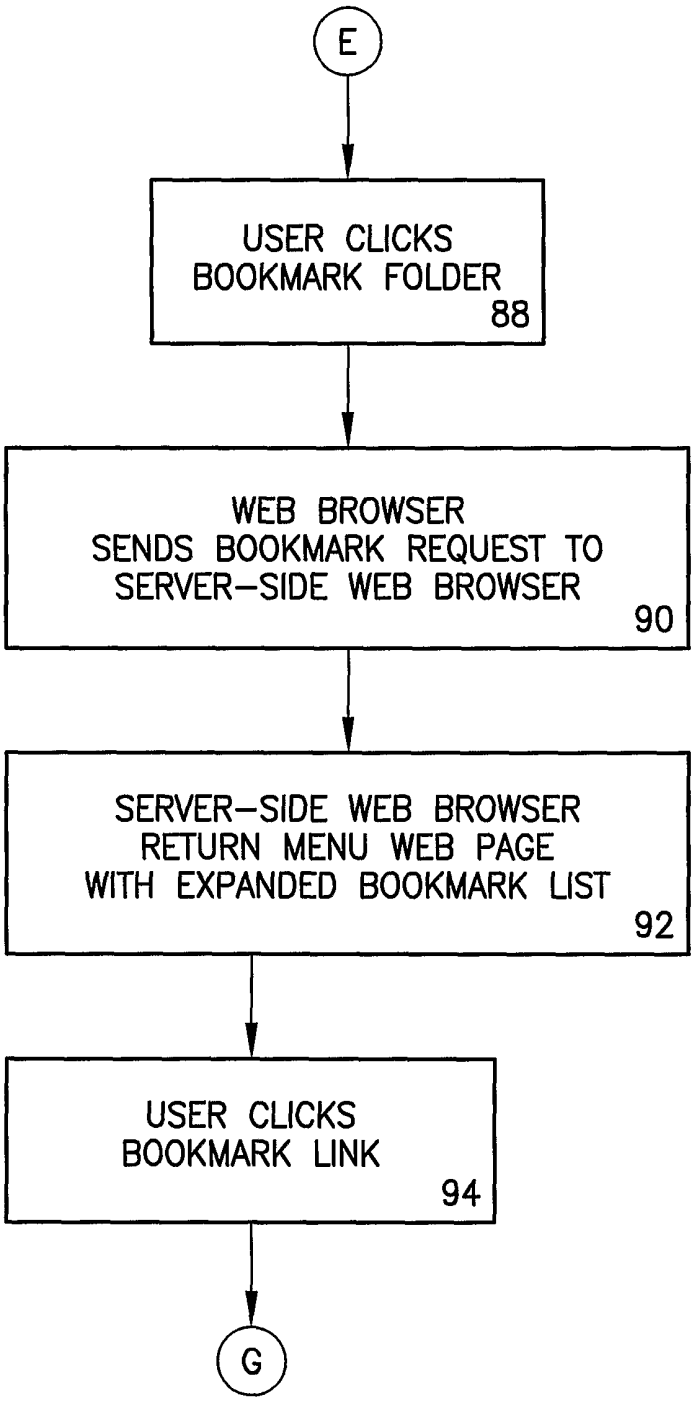
E
USER CLICKS BOOKMARK FOLDER 88
WEB BROWSER SENDS BOOKMARK REQUEST TO SERVER-SIDE WEB BROWSER 90
SERVER-SIDE WEB BROWSER RETURN MENU WEB PAGE WITH EXPANDED BOOKMARK LIST 92
USER CLICKS BOOKMARK LINK 94
G

Fig. 9

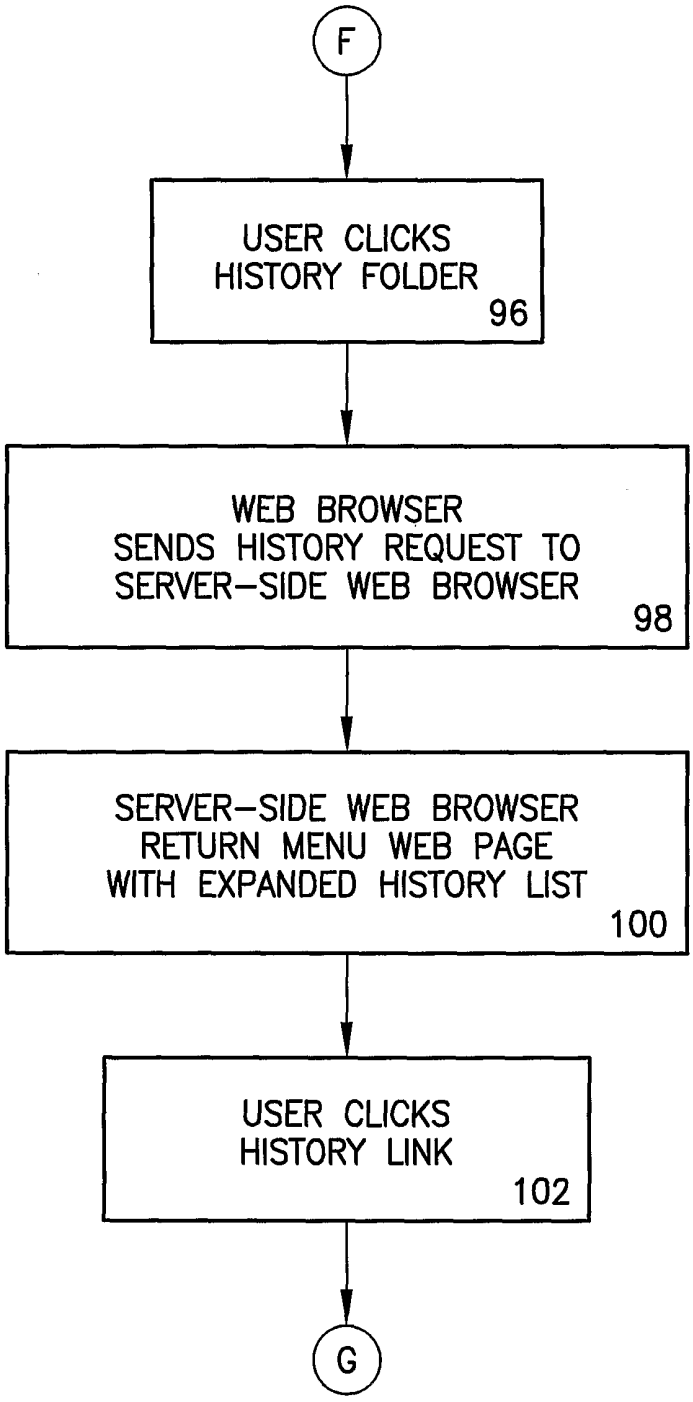
F
USER CLICKS HISTORY FOLDER
96
WEB BROWSER SENDS HISTORY REQUEST TO SERVER-SIDE WEB BROWSER
98
SERVER-SIDE WEB BROWSER RETURN MENU WEB PAGE WITH EXPANDED HISTORY LIST
100
USER CLICKS HISTORY LINK
102
G

Fig. 10

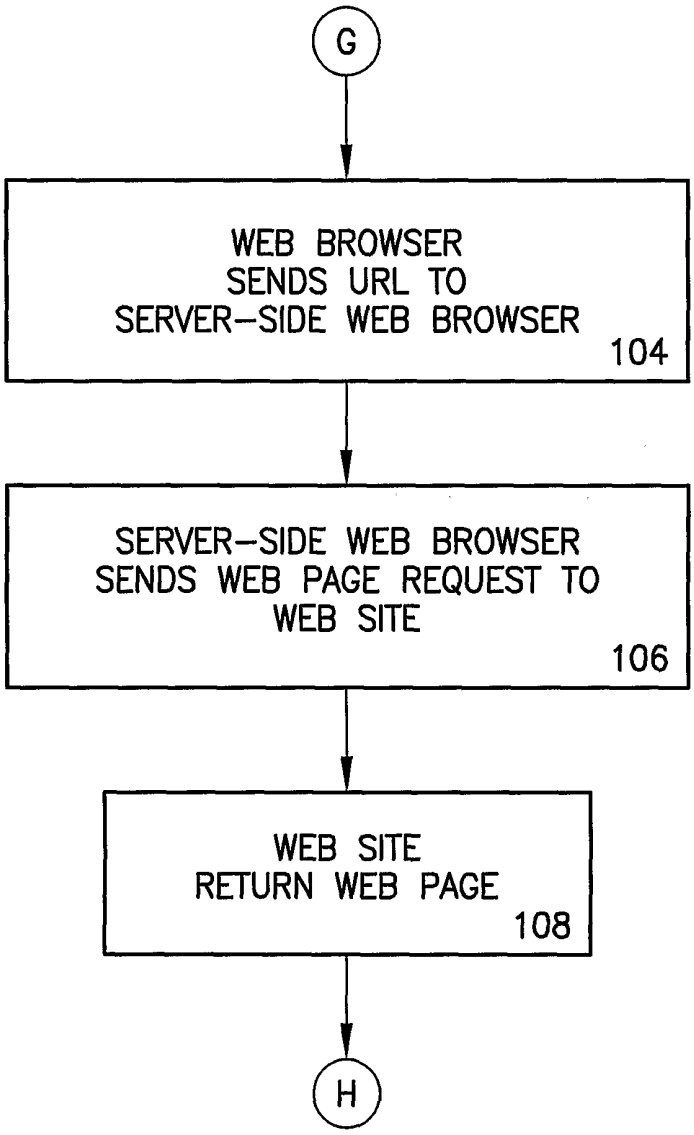
G
WEB BROWSER SENDS URL TO SERVER-SIDE WEB BROWSER
104
SERVER-SIDE WEB BROWSER SENDS WEB PAGE REQUEST TO WEB SITE
106
WEB SITE RETURN WEB PAGE
108
H

Fig. 11

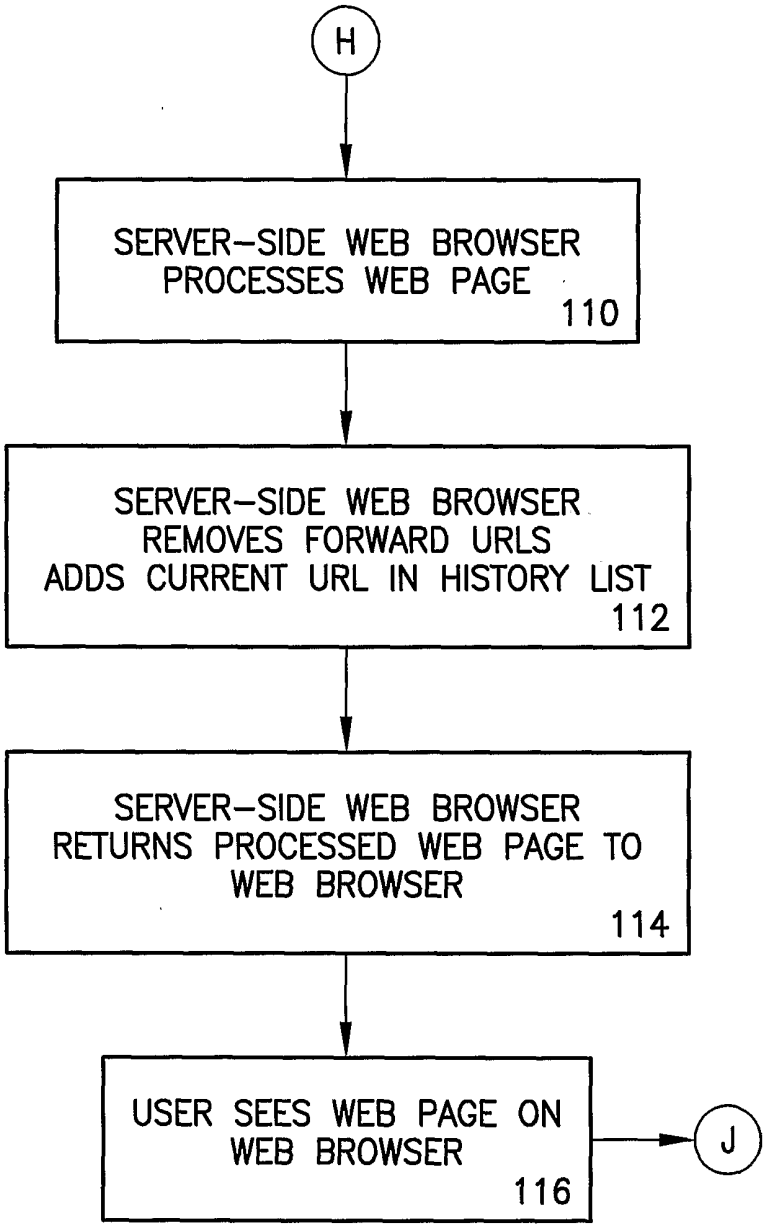
H
SERVER-SIDE WEB BROWSER PROCESSES WEB PAGE
110
SERVER-SIDE WEB BROWSER REMOVES FORWARD URLS ADDS CURRENT URL IN HISTORY LIST
112
SERVER-SIDE WEB BROWSER RETURNS PROCESSED WEB PAGE TO WEB BROWSER
114
USER SEES WEB PAGE ON WEB BROWSER
116
J

Fig. 12

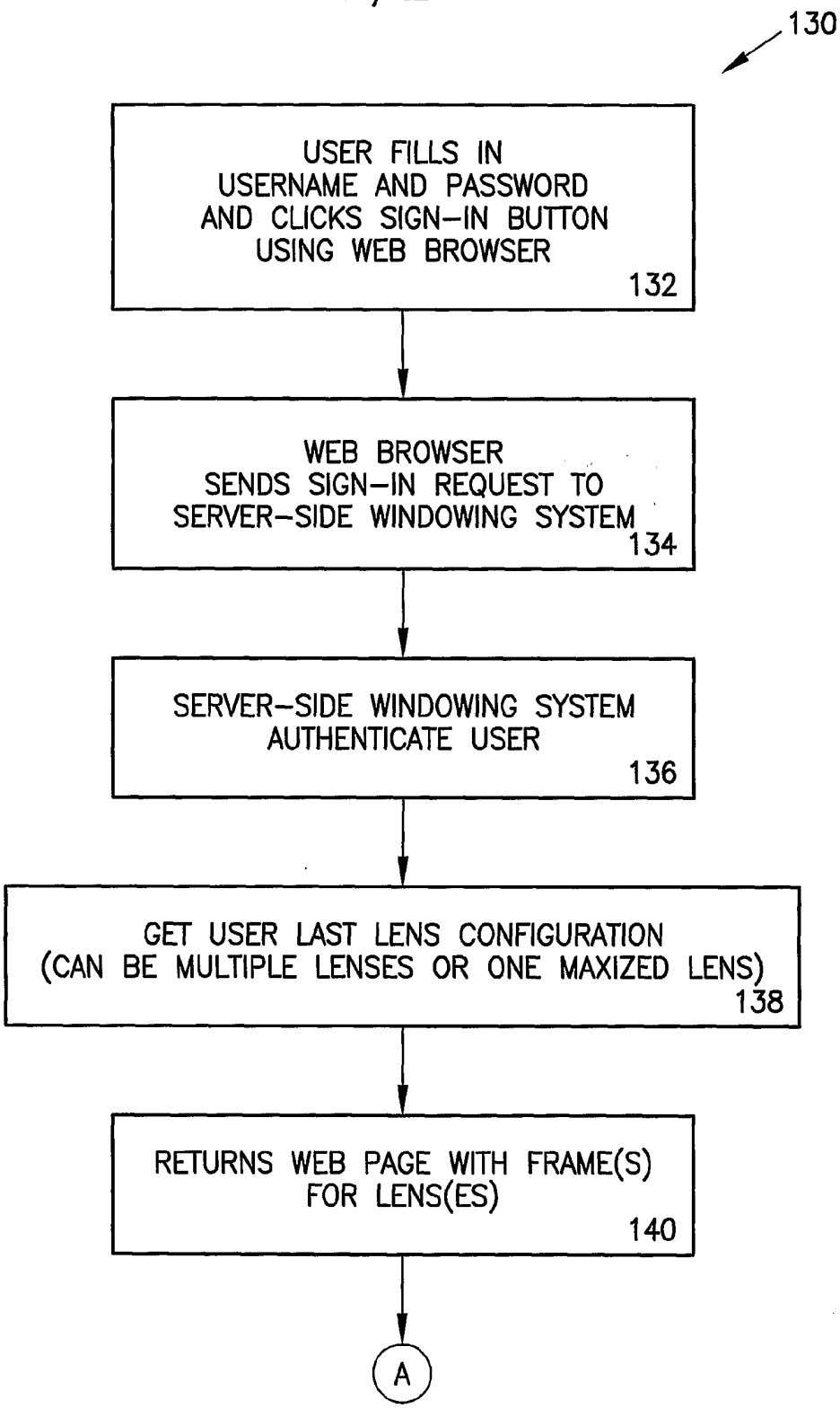
130
USER FILLS IN USERNAME AND PASSWORD AND CLICKS SIGN-IN BUTTON USING WEB BROWSER
132
WEB BROWSER SENDS SIGN-IN REQUEST TO SERVER-SIDE WINDOWING SYSTEM
134
SERVER-SIDE WINDOWING SYSTEM AUTHENTICATE USER
136
GET USER LAST LENS CONFIGURATION (CAN BE MULTIPLE LENSES OR ONE MAXIZED LENS)
138
RETURNS WEB PAGE WITH FRAME(S) FOR LENS(ES)
140
A

Fig. 13

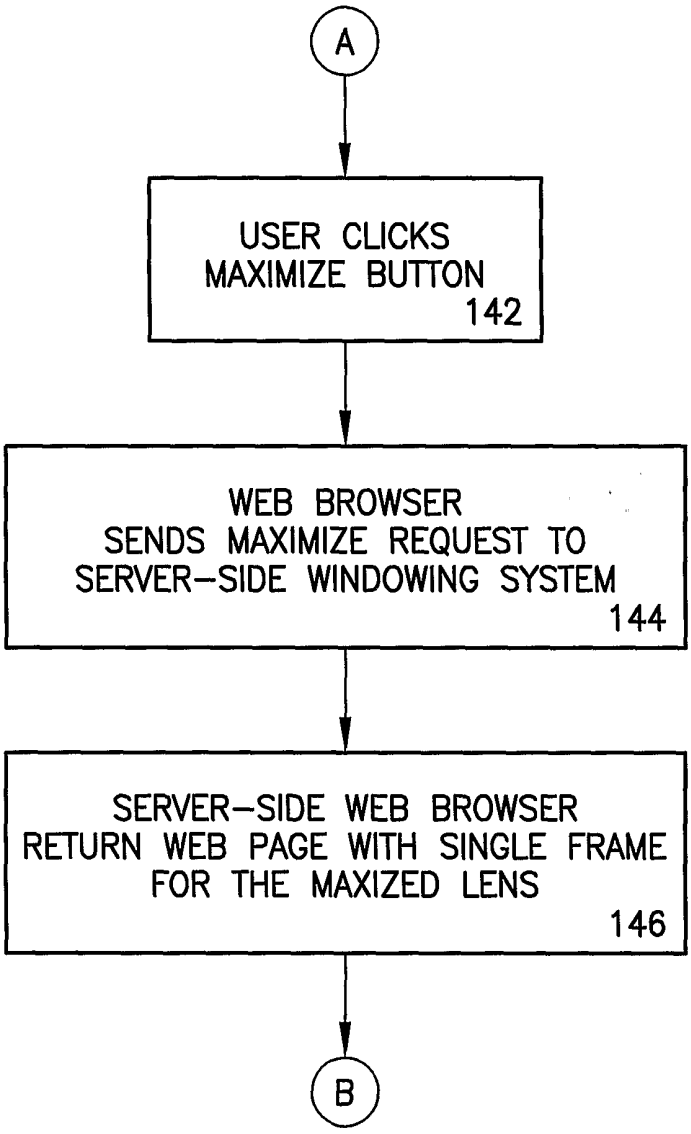
A
USER CLICKS MAXIMIZE BUTTON 142
WEB BROWSER SENDS MAXIMIZE REQUEST TO SERVER-SIDE WINDOWING SYSTEM 144
SERVER-SIDE WEB BROWSER RETURN WEB PAGE WITH SINGLE FRAME FOR THE MAXIZED LENS 146
B

Fig. 14

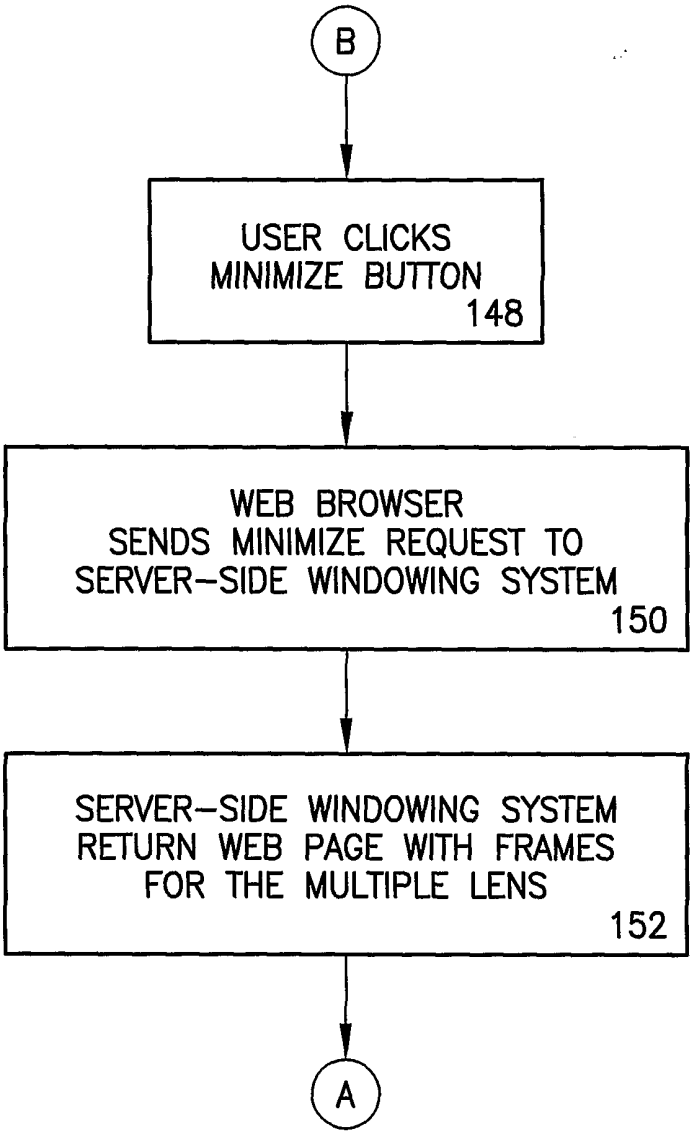
B
USER CLICKS MINIMIZE BUTTON 148
WEB BROWSER SENDS MINIMIZE REQUEST TO SERVER-SIDE WINDOWING SYSTEM 150
SERVER-SIDE WINDOWING SYSTEM RETURN WEB PAGE WITH FRAMES FOR THE MULTIPLE LENS 152
A

Fig. 15

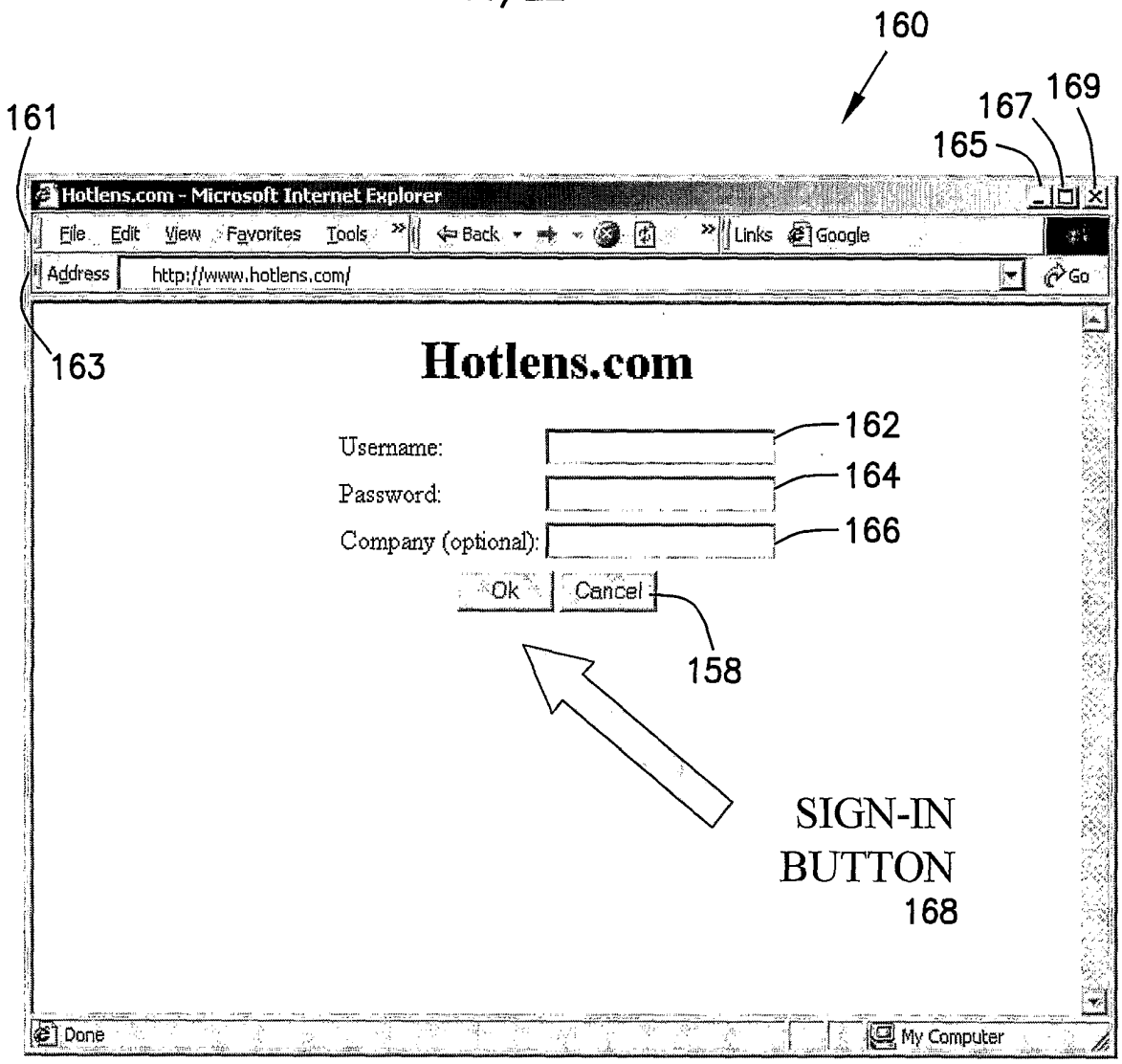
160
161
167
169
165
Hotlens.com - Microsoft Internet Explorer
File Edit View Favorites Tools
Back
Links Google
Address http://www.hotlens.com/
Go
163
Hotlens.com
Username:
Password:
Company (optional):
162
164
166
Ok
Cancel
158
SIGN-IN
BUTTON
168
Done
My Computer

Fig. 16

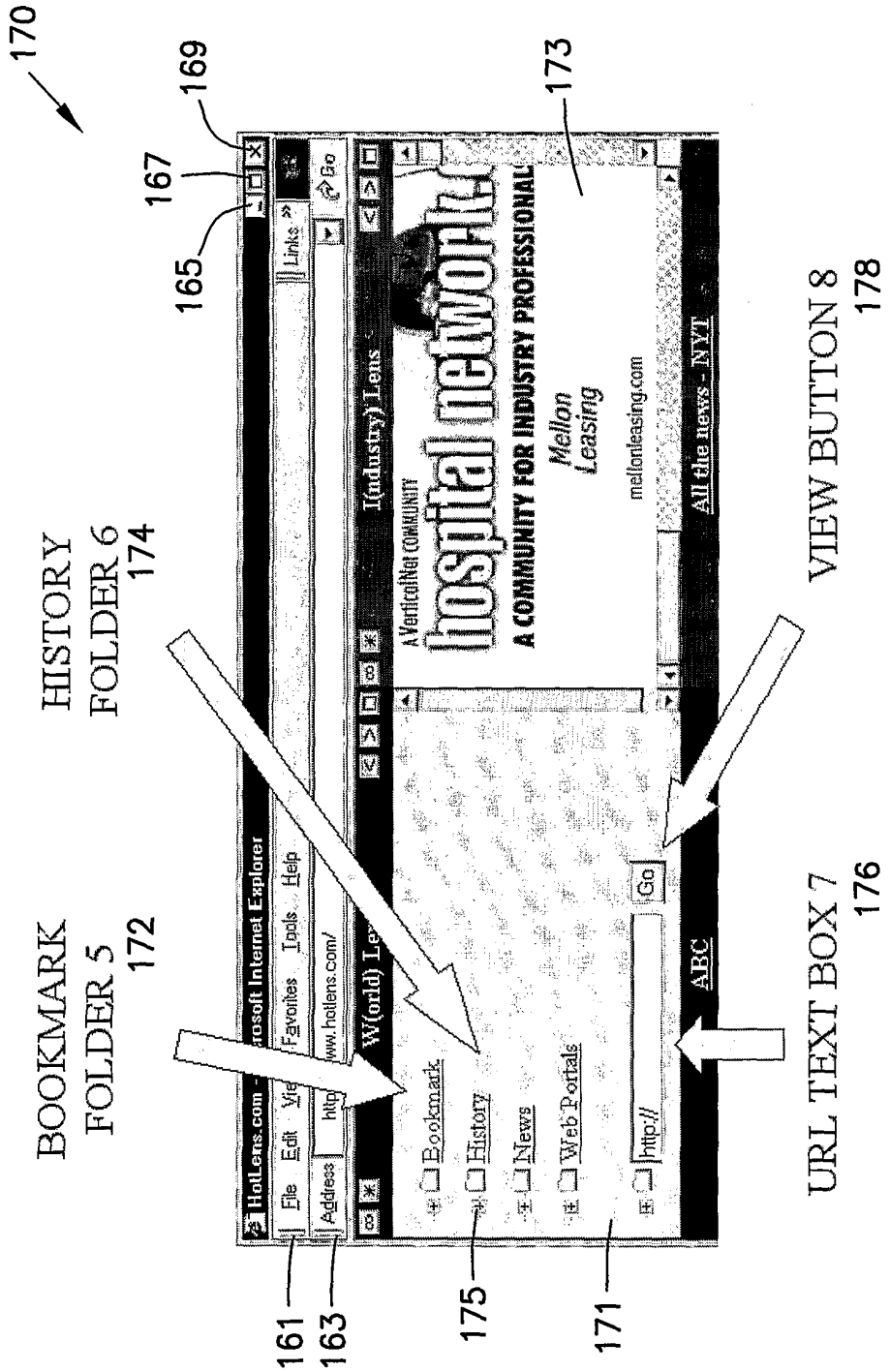
170
169
167
165
173
HISTORY FOLDER 6
174
BOOKMARK FOLDER 5
172
VIEW BUTTON 8
178
URL TEXT BOX 7
176
161
163
175
171
HotLens.com
File Edit View Favorites Tools Help
Address http://www.hotlens.com/
Links
Go
W(orld) Lens
I(ndustry) Lens
Bookmark
History
News
Web Portals
http://
Go
ABC
A VerticalNet COMMUNITY
hospital network
A COMMUNITY FOR INDUSTRY PROFESSIONALS
Mellon Leasing
mellonleasing.com
All the news - NYT

Fig. 17

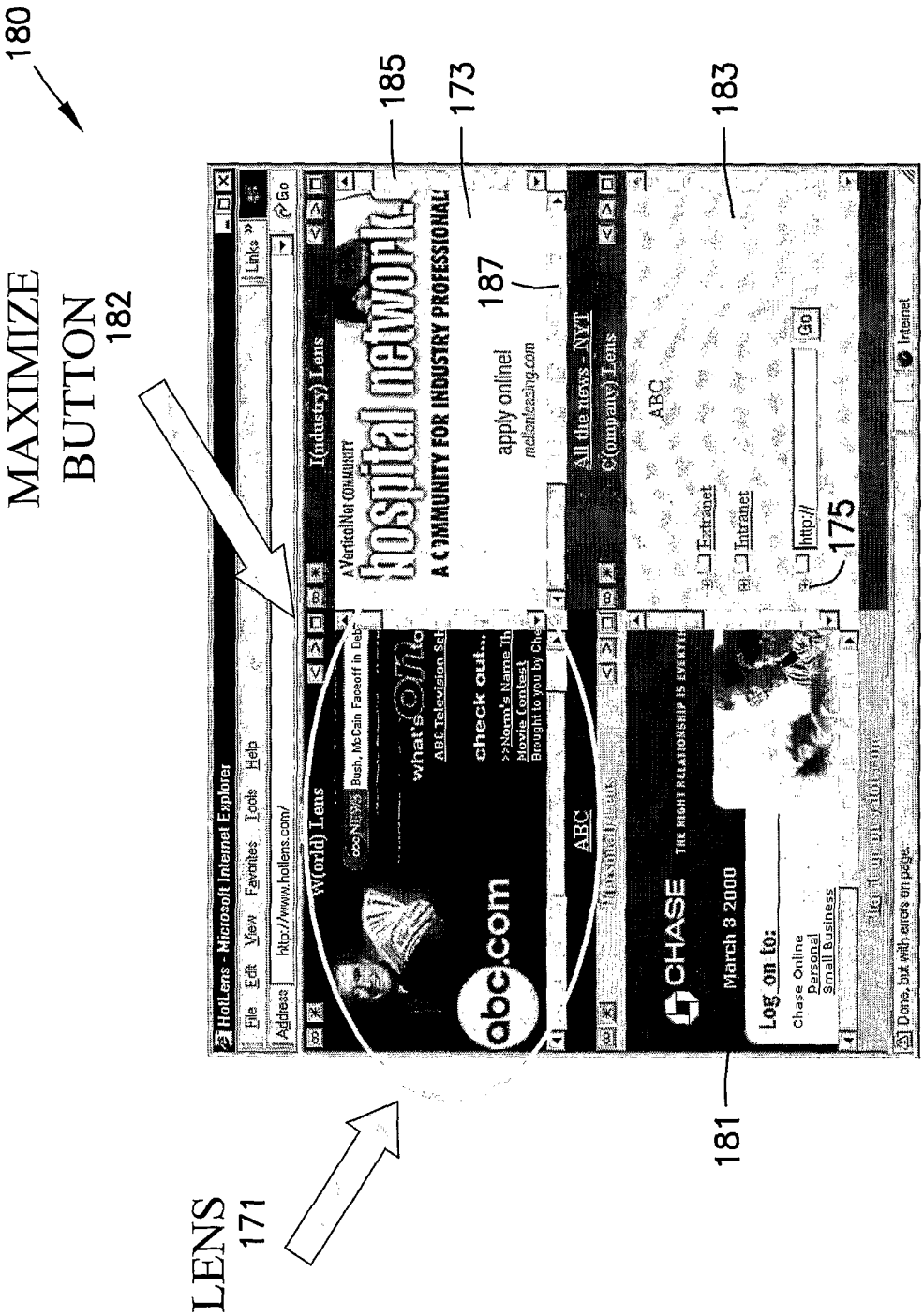
180
MAXIMIZE BUTTON
182
185
173
183
187
175
181
LENS
171
HotLens - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address http://www.hotlens.com/
Links
Go
W(orld) Lens
I(ndustry) Lens
A VerticalNet COMMUNITY
hospital network
A COMMUNITY FOR INDUSTRY PROFESSIONALS
apply online!
mellonleasing.com
All the news - NYT
C(ompany) Lens
ABC
Extranet
Intranet
http://
Go
abc.com
check out...
CHASE
March 3 2000
Log on to:
Chase Online
Personal
Small Business
Done, but with errors on page.
Internet

Fig. 18

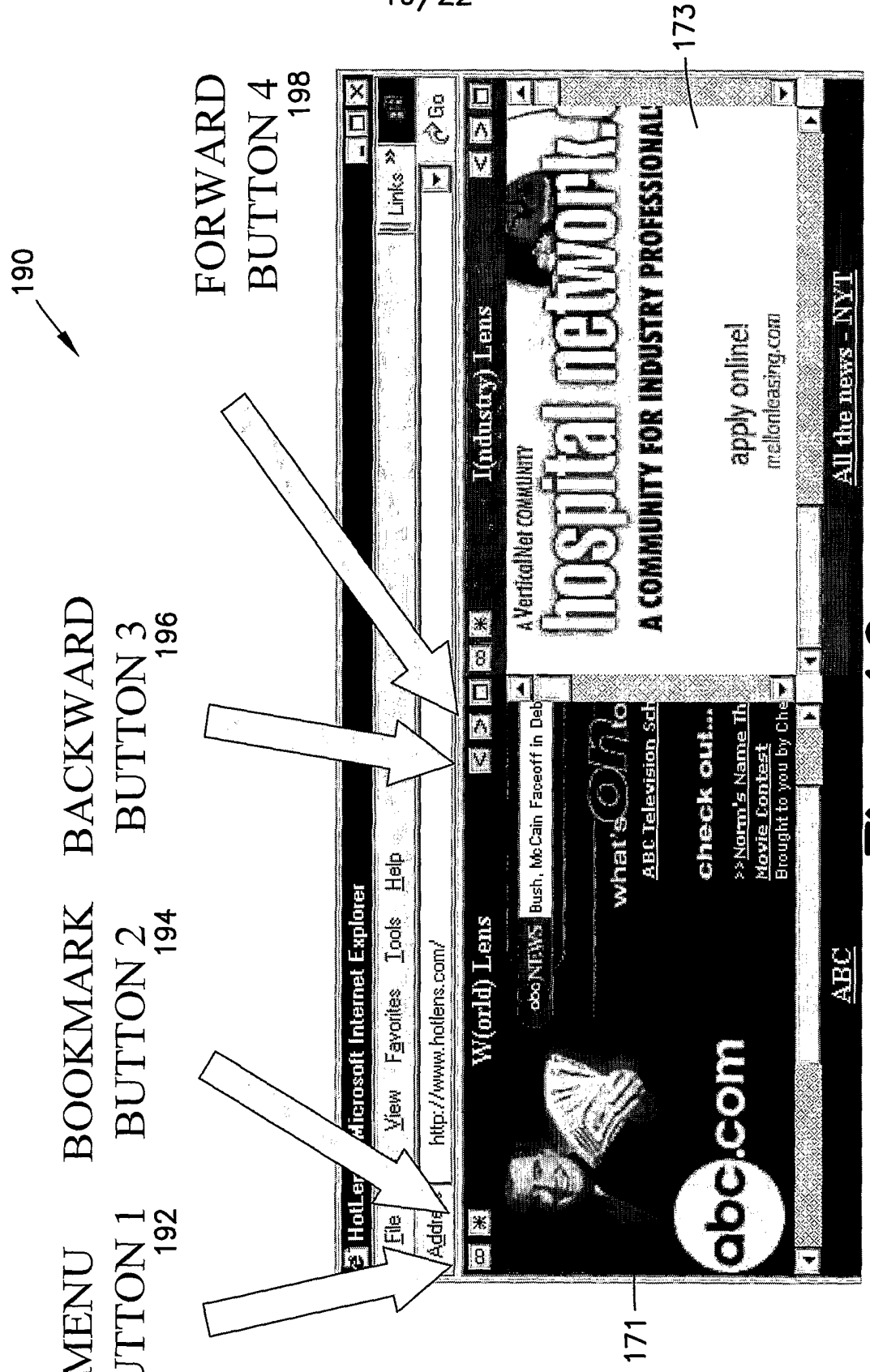
190
MENU BUTTON 1
192
BOOKMARK BUTTON 2
194
BACKWARD BUTTON 3
196
FORWARD BUTTON 4
198
171
173
Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address http://www.hollens.com/
Links
Go
W(orld) Lens
I(ndustry) Lens
ABC NEWS
Bush, McCain Faceoff in Deb
what's on
ABC Television Sch
check out...
>>Norm's Name Th
Movie Contest
Brought to you by Che
abc.com
A VerticalNet COMMUNITY
hospital network
A COMMUNITY FOR INDUSTRY PROFESSIONALS
apply online!
mallonleasing.com
ABC
All the news - NYT

Fig. 19

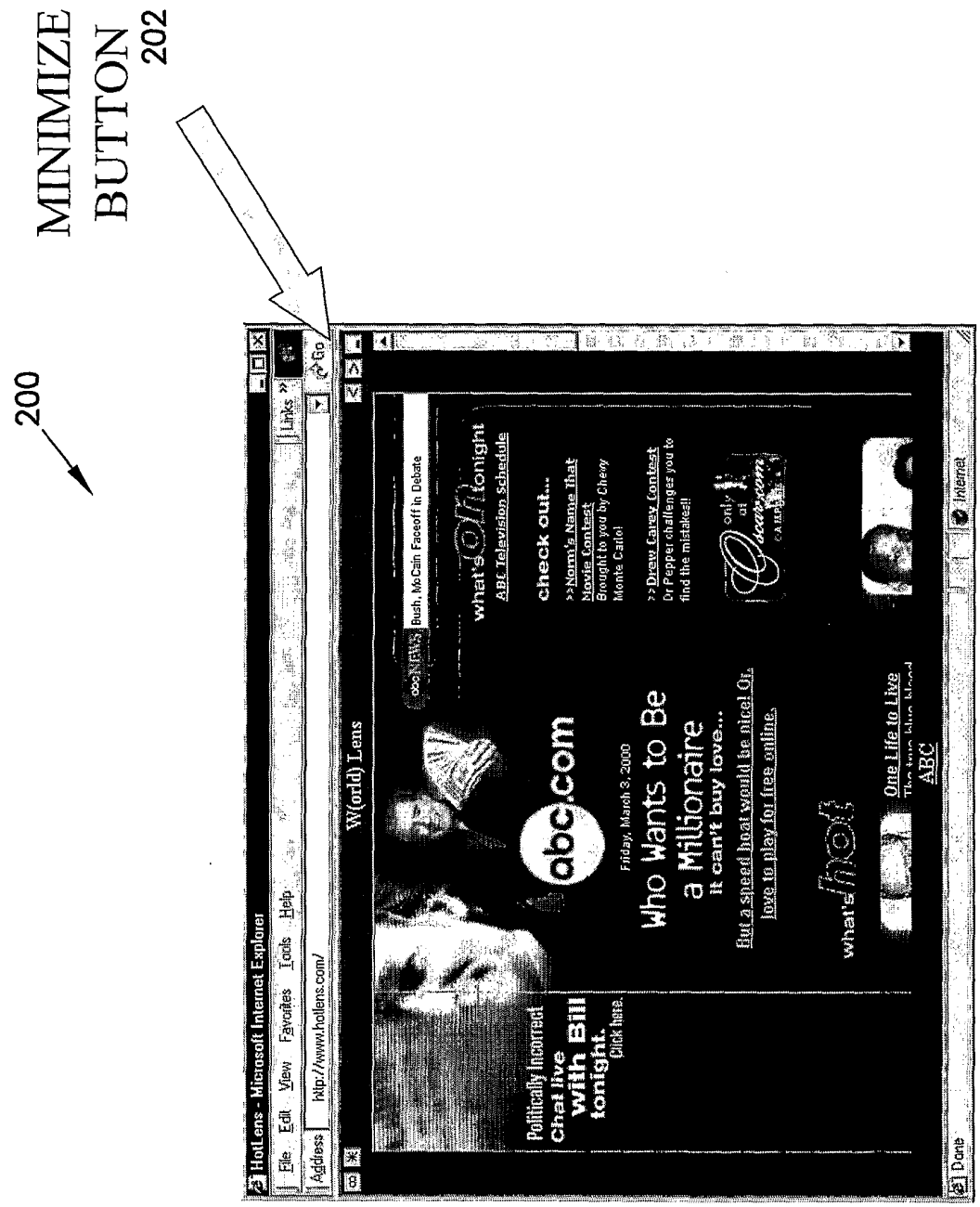
MINIMIZE BUTTON
202
200
HotLens - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address http://www.hollens.com/
Links
Go
W(orld) Lens
Politically Incorrect
Chat live with Bill tonight.
Click here.
abc.com
Friday, March 3, 2000
Who Wants to Be a Millionaire
it can't buy love...
But a speed boat would be nice! Or,
love to play for free online.
what's hot!
Bush, McCain Faceoff In Debate
what's on tonight
ABC Television Schedule
check out...
>>Norm's Name That Movie Contest
Brought to you by Chevy
Monte Carlo!
>> Drew Carey Contest
Dr Pepper challenges you to find the mistake!!
Oscar.com
One Life to Live
ABC
Done
Internet

Fig. 20

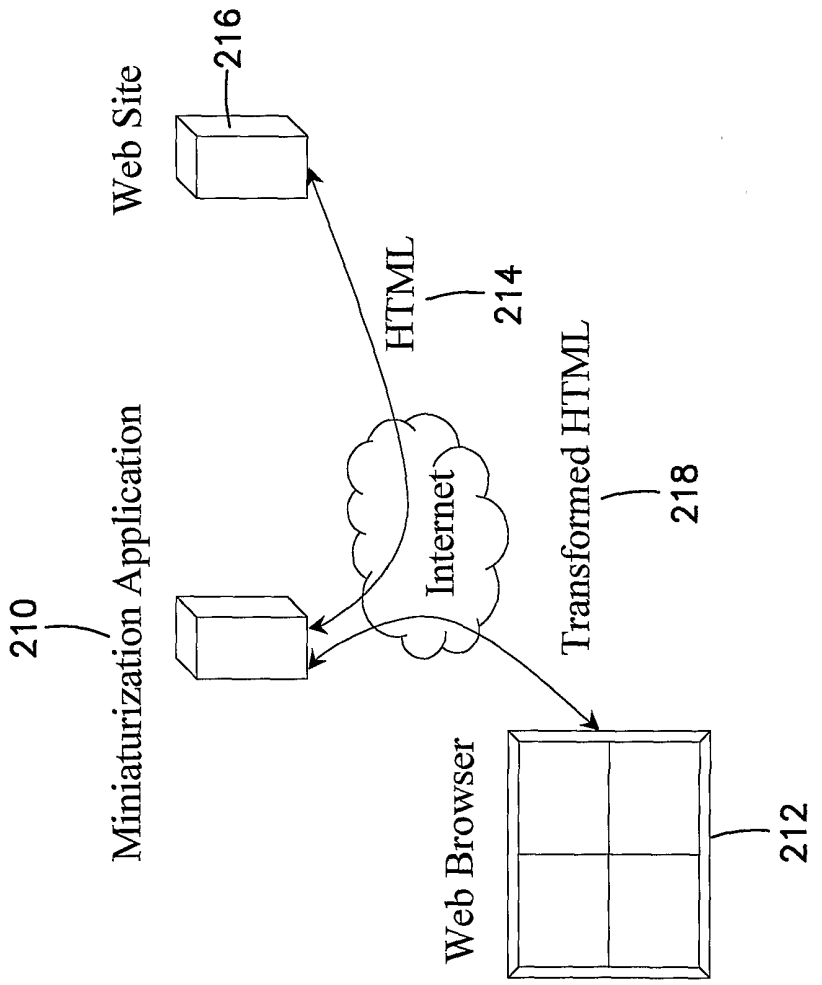
Web Site
216
HTML
214
Internet
Transformed HTML
218
210
Miniaturization Application
Web Browser
212

Fig. 21

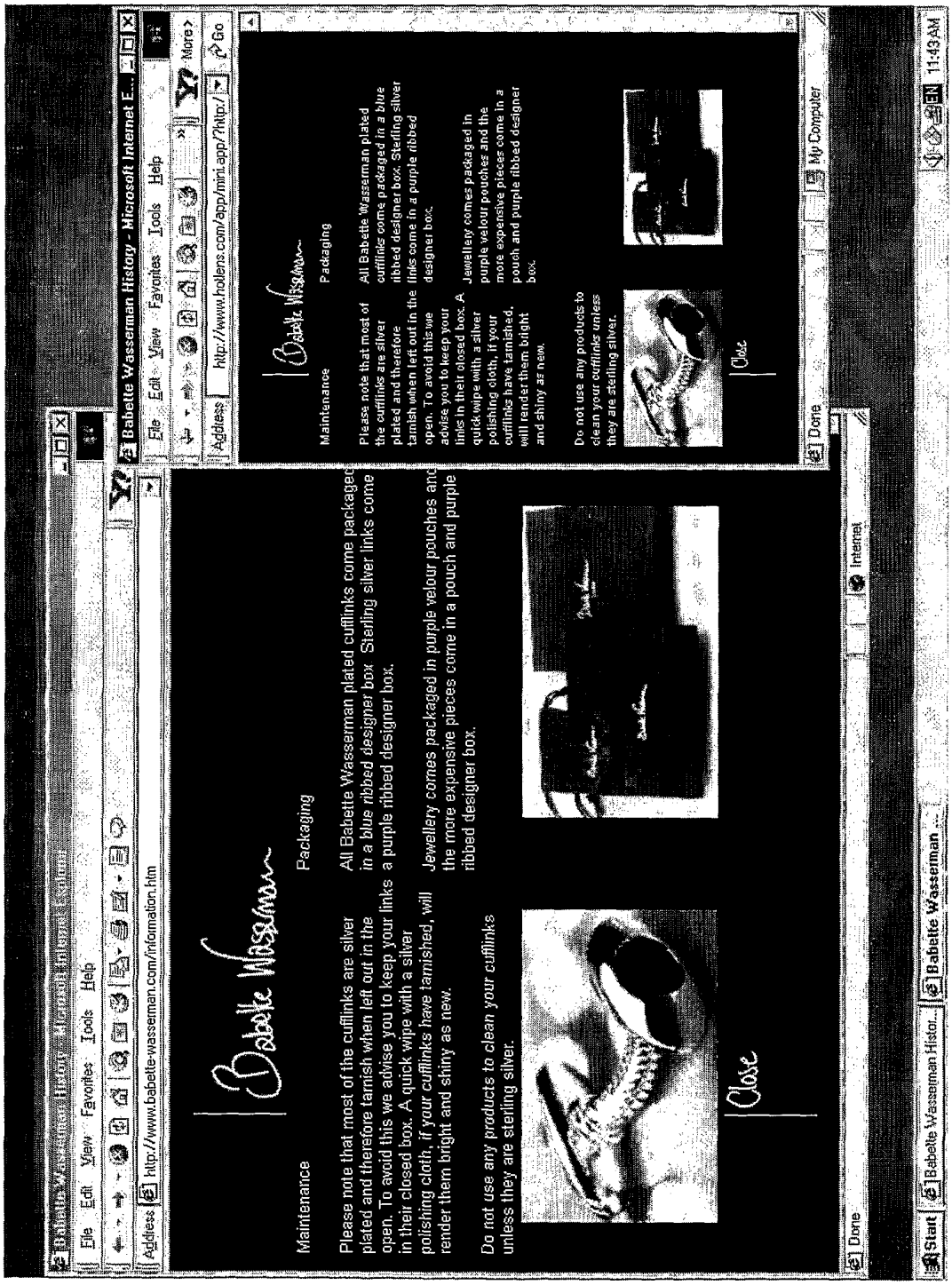
Babette Wasserman
Packaging
Maintenance
Please note that most of the cufflinks are silver plated and therefore tarnish when left out in the open. To avoid this we advise you to keep your links in their closed box. A quick wipe with a silver polishing cloth, if your cufflinks have tarnished, will render them bright and shiny as new.
Do not use any products to clean your cufflinks unless they are sterling silver.
All Babette Wasserman plated cufflinks come packaged in a blue ribbed designer box. Sterling silver links come a purple ribbed designer box.
Jewellery comes packaged in purple velour pouches and the more expensive pieces come in a pouch and purple ribbed designer box.
Close
Babette Wasserman History - Microsoft Internet E...
http://www.babette-wasserman.com/information.htm
http://www.hollens.com/app/mini.app/?http:/
Done
Internet
My Computer
Start
11:43 AM

Fig. 22

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US01/07244

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :G06F 17/30
US CL : 707/501, 513, 526; 345/326, 339, 342, 346
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 707/501, 513, 526; 345/326, 339, 342, 346

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WEST USPAT Database
search terms: internet, browser, web page, html, frame, windows, proxy server

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6,023,714 A (HILL et al) 08 February 2000, col.2, line 1 to col3, line 37	1-445
Y	US 5,923,326 A (BITTINGER et al) 13 July 1999, col.1, line 51 to col. 3, line 67.	1-445
Y	US 6,003,032 A (BUNNEY et al) 14 December 1999, col.2, line 1 to col.2, line 53; col.9, col.1 to col10, line 35.	1-445
A	US 5,918,010 A (APPLEMAN et al) 29 June 1999, all.	1-445
A	US 5,951,636 A (ZERBER) 14 September 1999, all.	1-445
A	US 6,025,844 A (PARSONS) 15 February 2000, all.	1-445

[X] Further documents are listed in the continuation of Box C. [ ] See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 26 APRIL 2001	Date of mailing of the international search report 21 MAY 2001
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer STEPHEN HONG Telephone No. (703) 305-3900

Form PCT/ISA/210 (second sheet) (July 1998)*

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US01/07244

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A, P	US 6,151,622 A (FRAENKEL et al) 21 November 2000, all.	1-445