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APPLICANTS

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The term of this patent subsequent to 6,014,698 has been disclaimed

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TITLE

INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMATION BEING DELIVERED

U.S. DEPT. OF COMM./PAT. & TM—PTO-436L (Rev.12-94)

PARTS OF APPLICATION FILED SEPARATELY

L. Johnson
Applications Examiner

NOTICE OF ALLOWANCE MAILED: 9/6/01

Assistant Examiner

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DRAWING

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FORM PTO-1267 (Rev. 11-92) U.S. Department of Commerce Patent and Trademark Office

DISCLAIMER LABEL

Application No. 08-858,650

A terminal disclaimer has been entered and recorded under 35 U.S.C. 253 in this file.

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Formal Drawings ___ sms/set

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Date Entered or Counted			Date Received or Mailed
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	3.	DEC + Fee	11/26/97
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May 19, 1997

EXPRESS MAIL POST OFFICE TO ADDRESSEE LABEL NO. EM484077838US

Commissioner of Patents and Trademarks
BOX PATENT APPLICATION
Washington, D.C. 20231

Re: U.S. Patent Application: INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMATION BEING DELIVERED
Inventors: Michael John Griffiths and James David McElhiney
Our File No.: 18022-001

Sir:

The enclosed Patent Application of the above-referenced inventors, Michael John Griffiths, Westminster, Colorado, and James David McElhiney, Ottawa, Ontario, Canada, is being filed by **EXPRESS MAIL POST OFFICE TO ADDRESSEE (Label No. EM484077838US)** with the specification, claims, abstract, and drawings which are sufficient to obtain a filing date under 37 C.F.R. 1.53 of the Patent Office Rules. The applicants will complete the application by submitting the required filing fee and declaration within the time allowed under 37 C.F.R. 1.53.

The correspondence address for purposes of Rule 1.53 is as follows:

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0885B650 .051997

INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMATION BEING DELIVERED

Invented by:

Michael J. Griffiths

James D. McElhiney

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Michael John Griffiths and James David McElhiney	)	
Serial No.:	Not Yet Accorded	)	Art Unit: Not Yet Accorded
Filing Date:	Not Yet Accorded	)	
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Title:	INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMATION BEING DELIVERED	)	
Our File No.:	18022-001	)	

CERTIFICATE OF EXPRESS MAILING UNDER 37 C.F.R. 1.10

I hereby certify that the following documents:

1. Patent Application (including fifty-three (53) pages of specifications, eight (8) pages of claims (1-42), and Abstract) entitled INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMATION BEING DELIVERED;

2. Four (4) sheets of drawings (Figures 1-4);

3. Transmittal Letter to Assistant Commissioner of Patents; and

4. Post Card for return by U.S. Patent and Trademark Office

are being deposited with the United States Postal Service as EXPRESS MAIL POST OFFICE TO ADDRESSEE, postage prepaid, EXPRESS MAIL LABEL NO. EM484077838US, in an envelope addressed to: Assistant Commissioner for Patents, BOX PATENT APPLICATION, Washington, D.C. 20231, on this 19th day of May, 1997.

Scott B. Allen

BACKGROUND OF THE INVENTION

1. **Field of the Invention:**

This invention relates to the system for the storage, management, and delivery of information on a computer network and, more specifically, to the efficient and reliable storage, delivery, and monitoring of advertising and other information on a computer network.

2. **Description of the Prior Art:**

During recent years there have been rapid advancements in computers and computer networking. In particular, the world-wide network of computers commonly referred to as the Internet has seen explosive growth The Internet comprises a vast network of smaller wide area and local area computer networks connected together so as to allow the sharing of resources and to facilitate data communication between computers and users. The rapid growth of the Internet is due, in large part, to the introduction and widespread use of graphical user interfaces called browsers which allow users easy access to network servers and computers connected to the Internet and, more particularly, the World Wide Web.

The World Wide Web forms a subset of the Internet and includes a collection of servers, computers, and other devices. Each server may contain documents formatted as web pages or hypertext documents that are accessible and viewable with a web compliant browser, such as the Netscape Navigator™ browser or the Mosaic™ browser. Each hypertext document or web page may contain references to graphic files or banners that are to be displayed in conjunction with the hypertext document or web page. The files and banners may or may not be stored at the same location as the hypertext document or web page.

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A hypertext document often contains hypertext links to other hypertext documents such that the other hypertext documents can be accessed from the first hypertext document by activating the hypertext links. The servers connected to the World Wide Web utilize the Hypertext Transfer Protocol (HTTP) which is widely known protocol which allows users to use browsers to access web pages and the banners or files associated with web pages. The files, banners, hypertext documents, or web pages may contain text, graphics, images, sound, video, etc. and are generally written in a standard page or hypertext document description language known as the Hypertext Markup Language (HTML). The HTML format allows a web page developer to specify the location and presentation of the graphic, textual, sound, etc. on the screen displayed to the user accessing the web page. In addition, the HTML format allows a web page to contain links, such as the hypertext links described above, to other web pages or servers on the Internet. Simply by selecting a link, a user can be transferred to the new web page, which may be located very different geographically or topologically from the original web page.

When using a conventional browser, a user can select which web page or hypertext document the user wishes to have displayed on the user's computer or terminal by specifying the web page's Universal or Uniform Resource Locator (URL) address. Each server has a unique URL address and, in fact, so does each web page and each file needed to display the web page. For example, the URL address for the U.S. Patent and Trademark Office is currently http://www.uspto.gov. When a user types in this URL address into a browser, the user's terminal establishes a connection with the U.S. Patent and Trademark Office and the initial web page for the U.S. Patent and Trademark Office is transmitted from the server storing this web page (which

may or may not be actually located at the U.S. Patent and Trademark Office) to the user's terminal and displayed on the user's terminal. The web page may include a number of graphic images or elements, often referred to as banners, which are to be displayed on the user's terminal in conjunction with the web page. Each of the graphic images is typically stored as a separate file on the server and has its own URL address. When the web page is initially transmitted from the server to the user's terminal, the browser receives the URL addresses for the graphic images and then requests that they be transmitted from the server on which they are stored to the user's terminal for display on the user's terminal in conjunction with the web page. The server(s) on which the graphic images are stored may or may not be the same server on which the original web page is stored. More specifically, since the URL's addresses for the included graphic images are all processed separately using the HTML protocols, it is possible and, in fact, common, for these graphic images to be stored on separate and even widely distributed computers or hosts, all of which are accessible to the user's terminal via a computer network. For purposes of the present invention, the term "banner" is meant to be construed very broadly and includes any information displayed in conjunction with a web page wherein the information is not part of the same file as the web page. That is, a banner includes anything that is displayed or used in conjunction with a web page, but which can exist separately from the web page or which can be used in conjunction with many web pages. Banners can include graphics, textual information, video, audio, animation, and links to other computer sites, web sites, web pages, or banners.

The growth of easy access to the World Wide Web and the ability to create visually pleasing web pages have helped increase the amount of advertising and other promotional

materials created for use and display with web pages. For example, a car manufacturer may have a web page describing the company and the cars and car parts that the company manufactures and sells. Part of the web page may include advertising information or banners such as, for example, images of current car models sold by the manufacturer or the types and numbers or cars the manufacturer has in stock. The car manufacturer may also contract with the owners or operators of other web pages to have the car manufacturer's advertisement banners displayed when users access these other web pages. Similarly, an advertising agency may contract with various web sites to have the advertisement banners of the agency's clients displayed when users access the web pages stored on the web sites. For example, an advertising agency or ad-network firm may contract with a web site containing general information about cars to have advertising information or banners included on the web pages displayed to a user accessing the web site. The advertising banners may contain graphics, text, etc. about car models or car parts manufactured by on of the advertising agency's clients. Furthermore, the advertisement banners may not be stored on the same server or computer or web site on which the web page is stored. Rather, all or a significant portion of the advertisement banners created by an advertising agency may reside on one or more information or ad servers. Typically, an advertising agency will pay a fixed amount of money for a fixed number of displays of its advertisement banners on a single web page or group of web pages. Therefore, advertising agencies are understandably very interested in knowing which advertisement banners have been displayed with which web pages and how often each advertisement banner has been displayed on terminals or otherwise served to terminals.

Unfortunately, the current state of the art is such that accurate counts are not made of how

many times an banner, even a banner containing an advertisement, is displayed to users or served to terminals. Furthermore, nature and extent of the problem of miscounting displays of banners is not well-known or even understood in the industry or by people of ordinary skill in the art. Therefore, despite the well-developed state of the art in the displaying of information, banners, and advertisements in conjunction with web pages, documents, or other information, there is still a need for a system for storing and delivering information and banners on a computer network where accurate counts of the number of times each piece of information and banner is displayed can be made and the information and banners are displayed quickly and efficiently to users or terminals. In addition, there is a need for a highly reliable, even fault-tolerant, system for storing and delivering the information and banners that will not significantly reduce the efficiency of the Internet or the servers on which the information and banners are stored, while providing for accurate monitoring and counting of the information and banners displayed to a user or served to a terminal.

SUMMARY OF THE INVENTION

Accordingly, it is a general object of the present invention to provide a system for storing and delivering information on a computer network.

It is a specific object of the present invention to provide a system for the storage, delivery monitoring, and tailoring of advertising information on a computer network.

It is another general object of the present invention to provide a system for storing and delivering information on a computer network wherein accurate counts of the number of times the

information is displayed or served to users or terminals can be made.

It is a specific object of the present invention to provide a system for storing and delivering information on a computer network wherein the operation of the computer network is not significantly affected.

It is another general object of the present invention to provide a system for storing and delivering information on a computer network wherein the system maintains a high degree of reliability and fault tolerance.

Additional objects, advantages, and novel features of the invention shall be set forth in part in the description that follows, and in part will become apparent to those skilled in the art upon examination of the following or may be learned by the practice of the invention. The objects and the advantages may be realized and attained by means of the instrumentalities and in combinations particularly pointed out in the appended claims.

To achieve the foregoing and other objects and in accordance with the purposes of the present invention, as embodied and broadly described herein, the system includes terminals connected to a computer network, either directly, or indirectly through an intermediary device such as a local or proxy server, that access computer or web sites also connected to the computer network to download or transmit pages, documents, or other information from the computer or web sites for storage or display on the terminals, wherein the pages, documents, or other information served to the terminals contain references to banners to be displayed in conjunction with the pages, documents, and information. The terminal initiates access or connection to a desired computer or web site to access a desired page. After the desired page is transmitted and

served to the terminal from the computer or web site, the terminal initiates and sends an initial banner request signal to an information server either requesting that unspecified banner be served to the terminal or that a specified banner be served to the terminal. The information server returns a redirect signal to the terminal telling the terminal the location on the computer network of the banner requested or specified by the terminal or selected by the information server, which location may be the information server, the computer site, or some other information server, computer site, or location accessible to the terminal via the computer network. The terminal then initiates a second specific banner request signal to the location of the banner requested or specified by the terminal or selected by the information server and the banner is transmitted to the terminal for display on the terminal, unless the requested or selected banner has previously been stored or cached in the terminal's memory or in the memory of a local or proxy server connected to the terminal, in which case the second banner request signal is not sent across the computer network and the banner is loaded and/or displayed directly from the terminal's memory or served to the terminal from the proxy server.

In a second embodiment, a primary information server and at least one mirror information server are connected to the computer site, but may be separated either geographically or network topologically. The banner information stored in the primary information server is also stored in each of the mirror information servers. All of the initial banner request signals are sent to the primary information server which determines which information server is best suited for delivering the banner to the terminal sending the initial banner request signal. As in the first embodiment, the banner may be specifically requested by the terminal or may be selected by the primary

information server. The primary information server then sends a signal to the terminal indicating to the terminal which information server the terminal should request the requested or selected banner from. The terminal then generates the second banner request signal to serve or transmit the banner from the information server selected by the primary information server. Should the primary information server go offline, one or more of the mirror information servers can become a new primary information server.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated in and form a part of the specification, illustrate the preferred embodiments of the present invention, and together with the descriptions serve to explain the principles of the invention.

In the Drawings:

Figure 1 illustrates a computer network over which the present invention can be implemented;

Figure 2 shows an representative web page accessible from a computer site connected to the computer network of Figure 1;

Figure 3 shows a flowchart diagram of a prior method for storing and delivering information across the computer network of Figure 1; and

Figure 4 shows a flowchart diagram of the preferred method of the present invention for storing and delivering information across the computer network of Figure 1.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

A representative computer network 30 is illustrated in Figure 1 and includes computers or terminals 32, 34, 36, 38, 40, 42, 44 with which users can access or connect to the computer network 30 and the resources connected to the computer network 30 such as the computer or web sites or servers 46, 48. The computer network 30 can include satellite links, microwave links, fiber optic transmission lines, local area networks, wide area networks, etc. Terminals, such as the terminals 36, 38, 40, 42, 44, may be connected to the computer network 30 via local or

caching proxy servers 50, 52 or other intermediary devices (not shown). Proxy servers allow multiple terminals to access the computer network 30, while reducing the number of physical connections to the computer network 30, as will be discussed in more detail below. A primary information server 54 and mirror information servers 56, 58 may also be connected to the computer network 30 to facilitate the serving and displaying of information or banners to the terminals 32, 34, 36, 38, 40, 42, 44, as will also be discussed in more detail below. The computer network 30 illustrated in Figure 1 is only meant to be generally representative of computer networks for purposes of elaboration and explanation of the present invention and other devices, networks, etc. may be connected to the computer network 30 without departing from the scope of the present invention. The computer network 30 is also intended to be representative of, and include, the Internet, the World Wide Web, privately or publicly owned or operated networks such as, for example, Tymnet, Telenet, America On-Line, Prodigy, Compuserve, Information America, and the Microsoft Network, and other local or wide area computer networks. The computer network 30 can also include or be representative of corporate or other private intranets, which are privately owned networks using Internet protocols. It should also be noted that the distinction between information servers, web site, computer sites, and generic servers is made only for the purposes of elaboration and explanation of the present invention and that a device can function simultaneously or alternatively as a computer site, web site, information server, generic server, or other device, or combinations thereof without falling outside the scope of the present invention.

By way of general introduction, in a typical computer network, a user located at a terminal

can access the resources connected to the computer network. For example, a user at the terminal 34 or terminal 36 can access the web site or computer site 46 and the information stored thereon. The computer site or server 46 may contain web pages, such as the web page 60 illustrated in Figure 2, that the user can download for display on the terminal 34. For purposes of this invention, the term "web page" shall be defined broadly and will include any hypertext document, information, screen displays, etc. that a user can download or otherwise retrieve from a computer or web site for display and/or storage on the user's terminal, and shall not be limited to only the information, pages, or documents retrievable by a user connected to the World Wide Web. Therefore, the term "web page" will be used generically to refer to information transmitted or served to a terminal from a computer site, web site, server, or other device, wherein the web page may contain banners or references to banners that can be served to the terminal and displayed in conjunction with the web page. The web page 60 may contain textual information, such as "XYZ COMPANY" and "Company History," and information configured in banners, such as the banners 62, 64, 66. The banners 62, 64, 66 may contain graphics, text, video, etc. As will be discussed in more detail below, the banners associated with a web page may not be stored at the same place as the web page and may be downloaded or served to a user's terminal separately from the web page. A significant feature and advantage of the present invention is in the way the banner information is selected and downloaded or served to a user's terminal from computer sites or information servers connected over a same computer network, as will be discussed in more detail below. The current state of the art is such that the counts of banner displays are largely inaccurate, banners are not targetable to large segments of the population using caching proxy

servers, and suffers when the performance gains provided by proxy servers are not taken into account in prior art methods of counting banner displays, as will also be discussed in more detail below.

In a conventional web page, such as the web page 60, if a user clicks on, or otherwise activates, the button associated with the textual information, a new web page might be displayed on the user's terminal. For example, if the user clicks on the button 68 associated with the textual information "Company History," a new web page devoted to the history of the XYZ company might be served from the computer site 46 to the user's terminal 34 and displayed on the user's terminal 34. Similarly, if the user clicks on the button 70 associated with the textual information "Product Line," a new web page devoted to the product line of the XYZ company might be served from the computer site 46 to the user's terminal 34 and displayed on the user's terminal 34. Each web page may contain similar "links" to other web pages, hypertext documents, web sites, etc. Activating a link available on a web page or hypertext document, therefore, provides the user with an ability to navigate or move to and display or download different documents, pages, banners, sites, or other information via the computer network 30.

When a user has a web page displayed on the user's terminal, the web page and its associated banners are often stored or cached in the terminal's memory for a period of time. In this fashion, if the user desires or requests that a web page previously displayed to the user on the terminal be reaccessed and displayed on the user's terminal, the web page and the banners associated with the requested web page can be loaded directly from the terminal's memory without reconnecting to the computer or web site on which the web page is stored and from which the web

page was originally served and without reconnecting to the computer site or information server on which the banners are stored and from the banners were originally served, thereby reducing the time needed to display the web page. Similarly, if the user's terminal is connected to a local or proxy server, the web page and the banners associated with the web page may be stored in the memory of the proxy server. Should the user at a terminal request a redisplay of a web page previously displayed on the user's terminal or previously displayed on any other terminal connected to the same proxy server, the web page and the banners associated from the web page can be served from the proxy server to the terminal for display on the terminal without connecting to the computer or web site on which the web page is stored and from which the web page was originally downloaded or served and without connecting to computer site or information servers on which the banners are stored and from which the banners were originally transmitted or served. Note that, in the case that the information is retrieved from a copy of the information previously stored held within a proxy server connected to the terminal, the serving of the information to the terminal will typically be completed by sending the information from the proxy server to the terminal, *i.e.*,without the participation of the computer site or server. Therefore, it is difficult for the computer site or server 46 to maintain an accurate count of the terminals 36, 38, etc. on which the information is displayed if the terminals are connected to caching proxy servers, if the performance benefits offered by the caching proxy server are desired.

As previously discussed above, a significant feature and advantage of the present invention is in the way the banner information is selected and transmitted and served to the user's terminal from computer sites or information servers connected over a same computer network. More

specifically, the method of the present invention allows banner information to be served over a computer network to a terminal, computer, etc. in a way which takes advantage of the performance enhancements offered by caching proxy servers and such that the operation of the computer network is not significantly affected while providing the ability to accurately track or count the number of times the banner information has been displayed on terminals connected to the computer network, as will be discussed in more detail below. It is not uncommon for banners to contain up to fifty kilobytes (KB) of information, thereby making the limiting of banner transmissions across a computer network very significant to the efficiency and operation of the computer network and to banner serving computer systems.

For purposes of elaboration and explanation of the present invention, the conventions and protocols of the World Wide Web, and browsers therefore, will be used as examples, in particular, the concept of a Uniform Resource Locator (URL), the Hypertext Transfer Protocol (HTTP), the Hypertext Markup Language (HTML), and the Transmission Control Protocol/Internet Protocol (TCP/IP). It should be noted, however, that the concepts underlying the present invention can be used for computer networks using other or different types of conventions and protocols. For more details on these protocols, the reader is directed to: Kevin Washburn and Jim Evans, TCP/IP running a successful network, 2nd Ed. (1996), published by Addison-Wesley, Douglas E. Comer, Internetworking with TCP/IP, 3rd Ed. (1995), published by Prentice Hall, John December and Mark Ginsberg, HTML 3.2 and CGI Unleashed Professional Reference Edition (1996), published by Sams.net Publishing, and Jerry Honeycutt *et al.*, Using HTML 3.2, 3rd Ed (1997), published by Que Corporation, all of these references of which are incorporated herein by reference. Other

information about the HTTP, HTML, TCP/IP and other network protocols can also be found in U.S. Patent No. 5,617,540 issued to *Civanlar et al.*, U.S. Patent No. 5,572,643 issued to *Judson*, and U.S. Patent No. 5,442,771 issued to *Filepp et al.*, all of which are also incorporated herein by reference. The linking of one web page or hypertext document to another is commonly done using a hypertext markup comment tag. When the user clicks on or otherwise activates the hypertext markup comment tag, a link to the new web page or hypertext document is generally initiated by the user's browser software which causes the user's terminal to request that the new web page or hypertext document be displayed on the user's terminal or computer. Similarly, if a web page served to a user's terminal contains banners, the URL addresses for the banners will be served with the web page so that the terminal can request that the banners be served to the terminal for display on the terminal along with the previously served web page.

It should also be noted that the disclosed system and method also work for all types of operating systems running on the computers, terminals, computer sites, information servers, and other devices connected to the computer network 30. Such operating systems can include, for example, Microsoft's DOS™, WINDOWS 3.x™, WINDOWS NT™, or WINDOWS 95™ software, IBM's OS/2™ software, Apple's System 7™ software, or the AIX or UNIX operating system software platforms.

Now referring back to Figure 1, computers or terminals can be connected to the computer network 30 in a variety of ways. For example, the terminals 32, 34 can be connected directly to the computer network 30 or may be attached via a dial-up line or network access service provider. Other terminals may connected to the computer via network proxy or local servers, such as the

proxy servers 50, 52. Proxy servers allow multiple computers, terminals, or computer networks to be connected to another computer network at a single point. In addition, since the connection from the terminals 32, 34 and the proxy server 50 to the computer network 30 is in most instances slower than the connections from the terminals 36, 38 to the proxy server 50, the proxy server 50 can provide significant speed improvements. For example, a large corporation may have all its terminals connected via a local area computer network. The local area computer network can be connected to a caching proxy server which is, in turn, connected to the computer network 30. In the computer network 30 illustrated in Figure 1, the terminals 36, 38 access the computer network 30 through the proxy server 50. Similarly, the terminals 40, 42, 44 access the computer network 30 through the proxy server 52. Using proxy servers allows multiple computers or terminals to access a computer network while limiting the number of physical connections to the computer network. Unfortunately, the use of proxy or network servers also creates some serious problems when the counting of banner information files displayed to users on terminals is desired, as will be discussed in more detail below.

As previously discussed above, the connection of computer sites, web sites, information servers, terminals, and other devices to a computer network allows the resources and information stored in the computer sites, information servers, and other devices to be accessible to users at the different terminals connected to the computer network. The users can also communicate with each other or the computer sites by sending messages or e-mail. When a user accesses the information stored at a computer site, information, web pages, or screen displays are generally served from the computer site for display on the user's terminal or computer. The information transmitted to

the user's terminal may contain a banner which is also served from the computer site, or which may be instead automatically served from other computer sites or information servers connected to the computer network. As a general example, referring once again to Figure 1, suppose a user at the terminal 36 accesses the web site or computer site 46 via the proxy server 50 and the computer network 30 in order to obtain information about the hypothetical XYZ Company. A web page about the XYZ Company, such as the web page 60 illustrated in Figure 2, may be served from the computer site 46 to the terminal 36 and displayed on the user's terminal 36. The web page 60 may contain places for banner information, such as the banners 62, 64, 66 illustrated in Figure 2. When the web page 60 is received by the user's terminal 36, the banners 62, 64, 66 may be received at the same time. Alternatively, instructions may be sent to the user's terminal 36 from the computer site 46 telling the terminal 36 where to find and request the banners 62, 64, 66 on the computer network 30, which may be the computer site 46, another computer site, or an information server such as the information servers 54, 56, 58. When such instructions are received by the user's terminal 36, the terminal 36 accesses the appropriate location of banners 62, 64, 66 via the computer network 30 and requests that the banners 62, 64, 66 be served for display on the user's terminal 36.

The process described above in relation to the example has many inherent problems, particularly when it is desired to count the number of times banner information is displayed on the user's terminal. More particularly, with reference to the previous example, the banners 62, 64, 66 displayed on the user's terminal may or may not be related to the XYZ Company. Regardless of the relationship between the banners 62, 64, 66 and the XYZ Company, the XYZ Company,

an advertising agency, or some other entity may wish to know how many times the banners 62, 64, 66 have been displayed on users' terminals. As a more specific example, suppose the banners 62, 64, 66 constitute advertisements. The advertiser and the company or client for whom the advertisements are created will be very interested in knowing how many times the advertisements are displayed on users' terminals. Therefore, accurate count information for the banners 62, 64, 66 is highly desirable. Unfortunately, such accurate count information is very difficult to acquire, as will now be discussed in more detail.

Now referring to Figure 3, a conventional method 72 used to download or serve web pages and banner information to a user's terminal is illustrated. Using the examples discussed above, a user at the terminal 36 can access the computer site 46 via the computer network 30 and request a web page to be served from the computer site 46 to the terminal 36 during the request page step 74. When the user requests a page during the request page step 74, a signal is sent from the user's terminal 36 to the computer site 46 via the proxy server 50 and the computer network 30 telling the computer site 46 which page stored on the computer site 46 the user desires to have displayed on the user's terminal 36. However, the request signal sent by the user's terminal 36 during the request page step 74 may not reach the computer site 46. If the user at the terminal 36 had previously requested the same page from the computer site 46, the page may already be stored in the user's terminal 36. Similarly, if any users at the terminals 36, 38 had requested the same page from the computer site 46, the page may be stored in the proxy server 50. After the user requests a page during the request page step 74, the terminal 36 may determine if the desired page is already stored in the terminal 36 during storage determination step 76. If the desired page is

already stored in the terminal 36, the terminal 36 will display the page during display step 78 without sending the signal to the computer site 46. If the desired page is not already stored in the terminal 36, the terminal 36 will send the page request signal during send page request step 80. Since the terminal 36 is connected to the proxy server 50, the page request signal sent during step 80 must pass through the proxy server before reaching the computer network 30. As a result, the proxy server 50 may determine if the desired page is already stored in the proxy server 50 during storage determination step 82 before it sends any signal to the computer site 46 over the computer network 30. If the desired page is already stored in the proxy server 50, the proxy server 50 can stop or otherwise terminate the page request signal, thereby stopping the page request signal from being received by the computer site 46, and the proxy server will serve the desired page directly to the terminal 36 for display on the terminal 36 during serve requested page step 84. The terminal 36 may also store the desired page in its own memory during the serve requested page step 84. If the proxy server 50 does not have the desired page already stored in its own memory, the proxy server 50 will send the page request signal to the computer site 46 over the computer network 30 during send page request step 85. The computer site 46 will then serve the desired page to the proxy server 50 and the terminal 36 for display on the terminal 36 during the serve requested page step 86. Either or both the terminal 36 and the proxy server 50 may store the desired page during the serve requested page step 86.

Since terminals may be connected to the computer network 30 without also being connected to proxy servers, the steps 82, 84, and 85 may not always be necessary in the method 72. For example, now referring to Figure 1, the terminal 34 is not connected to a proxy server but is

connected to the computer network 30. Therefore, the steps 82, 84 in the method 72 are not needed and the terminal 34 will send the page request signal via the computer network 30 directly to the computer site 46 during the send page request signal step 80.

The web page requested by the user from the computer site 46 may contain banner information, such as the banners 62, 64, 66 in the web page 60 illustrated in Figure 2. The banner information may be served with the web page or, more commonly, the banner information may reside in separate files which will need to be requested by the user's terminal 36 before the banner information can be displayed on the user's terminal 36 along with the requested web page. Typically, the web page information served to the terminal 36 for display on the terminal 36 will contain the electronic address information containing the location of the banner information on the computer network 30. The banner information may be located on the computer site 46 or at other locations connected to the computer network 30, as will be discussed in more detail below.

The terminal 36 will determine during banner determination step 88 if the page served to the terminal during steps 78, 84, or 86 contains banner information not already included in the web page displayed on the terminal 36. If the answer is no, *i.e.*, the web page served to the terminal 36 is complete, the process is ended. If the answer is yes, *i.e.*, the page served to the terminal 36 is not complete and contains banner information that needs to be served to the terminal 36, the terminal 36 requests the banner during request banner step 90.

Similar to the process described above for service of the desired page to the terminal 36, the terminal 36 first determines if the requested banner is already stored in the memory of the terminal 36 during banner storage determination step 92. The banner storage determination step

92 can occur in conjunction with the banner request step 90 such that no signal is generated by the terminal 36 if the requested banner is already stored in the terminal 36. If the requested banner is, in fact, already stored in the memory of the terminal 36, the terminal 36 will display the requested banner during display banner step 94 and the process is over. If the requested banner is not already stored in the memory of the terminal 36, the terminal 36 will generate and send a banner request signal during send banner request signal step 96. The request banner signal sent during the step 96 contains the address of the location of the desired banner so the computer network 30 can properly locate the desired banner.

Since the terminal 36 is connected to the proxy server 50, in a similar manner as described above in relation to steps 82, 84, 85, 86, once the proxy server 50 receives the banner request signal from the terminal 36, the proxy server 50 will determine whether or not the desired banner is already stored in the memory of the proxy server 50 during banner storage determination step 98. If the desired banner is already stored in the memory of the proxy server 50, the proxy server 50 will transmit and serve the banner directly to the terminal 36 for display by the terminal 36 during serve banner step 100. The terminal 36 may also store the banner in its own memory during the serve banner step 100. If the requested banner is not already stored in the proxy server 50, the proxy server will send the banner request signal to the device on which the requested banner is stored via the computer network 30 during the send banner request signal step 102. The device on which the requested banner is stored will then download or serve the requested banner to the proxy server 50 and the terminal 36 during the serve banner step 104 for display by the terminal 36. Either or both the terminal 36 and the proxy server 50 may store the banner served

by the device on which the requested banner is stored during the serve banner step 104.

The steps 98, 100, and 102 will not be necessary if a terminal requesting the banner information is not connected to a proxy server. For example discussed above, since the terminal 34 is not connected to a proxy server, the steps 98, 100, and 102 are not needed for the terminal 34 and the terminal 34 will send the page request signal via the computer network 30 directly to the server on which the requested banner is stored during send banner request signal step 102.

When the computer site 46 in the example described above in relation to Figure 3 is a web site using the HTTP and HTML protocols, the user selects and accesses the web site 46 by entering the Uniform Resource Locator (URL) address of the web site 46 into the terminal 36. The page request signal generated by the terminal 36 during step 74 tells the computer network 30 and the equipment associated with the computer network 30 which computer site the user wishes to access. Each computer and device attached to the computer network 30 will have its own unique URL address and each page and file stored in each computer will usually also have its own URL address so that each page and file can be made accessible to users via the computer network 30. For example, if the user desires to access the web page 60 for the XYZ company, the user may enter the URL address for the web page 60, http://www.xyzcompany.com, into the browser software operating on the user's terminal. The URL address contains an alphanumeric portion or domain name, "www.xyzcompany.com" that identifies the web site in an easy to understand and remember format. Each computer or web site and other host devices, end systems, networks, or network router devices connected to the computer network 30, however, has a unique Internet Protocol (IP) address that is thirty-two bits in length and is generally written as four

decimal numbers in the range zero (0) through 255, separated by periods. For example, an IP address could be 128.10.2.30 which in its full thirty-two bit format is 10000000.00001010.00000010.00011110. Providing every host computer on a computer network with a unique IP address allows any host computer to communicate with any other host computer.

By a process known as domain name resolution or by the use of Domain Name System (DNS), the IP address of the computer or web site on which XYZ Company's web page 60 and the web page 60 are stored can be determined from the domain name provided in the URL address. In fact, the IP address for computer or web site must first be determined when an URL address is entered by the user at a terminal that does not contain the IP address. For example, if a user at a terminal or computer enters the alphanumeric domain name address, *i.e.*, http://www.xyzcompany.com, the alphanumeric domain name must be resolved by the Domain Name System to a specific IP address, *i.e.*, http://019.247.56.38, before the designated and desired computer containing the web page 60 for the XYZ Company can be accessed. If the user enters the specific IP address directly, then use and access of the Domain Name System is not required. If resolution or determination of an IP address is required, the name server will return the appropriate IP address to the terminal which generated the signal in which the IP address was not included. The use and operation of domain name resolution and the Domain Name System for determining IP addresses are well known to people of ordinary skill in this art and need not be explained in any further detail for purposes of the present invention.

When the web page requested by the user during page request step 74 is served to the terminal 36 during steps 78, 84, or 86, the web page will often contain the URL addresses of

banners or banner information to be displayed along with the web page on the user's terminal 36 instead of the banner information itself. The terminal 36 will then use the URL addresses of the desired banner information to access the computer network 30 and request that the desired banner information be served to the terminal 36 for display on the terminal 36. For example, when the web page 60 for the XYZ company is served to a terminal, the web page may contain URL addresses for the banners 62, 64, 66. The URL address for the banner 62 may be of the form http://www.bannersite1.com/banner1.gif. The "bannersite1.com" portion of the URL address for the banner 62 indicates which device, for example the information server 54, connected to the computer network contains the requested banner 62 where the "banner1.gif" portion of the URL address for the banner 62 indicates which file stored on the indicated device constitutes the banner 62. Similarly, the URL address for the banner 64 may be of the form http://www.bannersite2.com/banner54.gif. The "bannersite2.com" portion of the URL address for the banner 64 indicates which device, for example the information server 56, connected to the computer network contains the requested banner 64 where the "banner54.gif" portion of the URL address for the banner 64 indicates which file stored on the indicated device constitutes the banner 64. As shown by these examples, the banner 62 may not be stored on the same device as the banner 64. In addition, as previously discussed above, the banners 62, 64 may be located on the same web site as the requested page or may be located on other web or computer sites, such as the computer or web site 48 shown in Figure 1, or on information servers, such as the information servers 54, 56, 58 shown in Figure 1. When the terminal 36 requests the banner information during step 96, the banner request signal will contain the URL addresses for each banner to be

displayed with the web page so that the banners can be located at, and served from, the appropriate devices on the computer network 30.

The prior art method 72

~~The method 72~~ discussed above and illustrated in Figure 3 has many inherent problems, however, which make it unsuitable for counting the number of times a banner is displayed on the terminals connected to the computer network 30, as will now be discussed in more detail. Since the web page, and the banners to be displayed with the web page, selected by the user can be stored in either the user's terminal or the proxy server connected to the user's terminal, not all requests for the banner information are forwarded by the user's terminal or respective proxy server and transmitted over the computer network 30. While this result may appear to be beneficial in that the amount of data traffic on the computer network 30 is reduced, in fact, this result prevents the accurate count of banner displays. More specifically, entities such as advertising agencies, advertising repping firms, and the entities hiring them want to count and know each time a banner is displayed on a user's terminal so that the success or failure of various advertising banners can be determined and so that the correct payment for the display of the advertising banners can be computed. There are two conventional ways in which the number of times a banner is displayed is counted. The first way is to count the number of times an information server or computer site serves a page during the step 86. The second way is to count the number of times that the information server actually serves a banner during the step 104. Unfortunately, a page requested by a terminal during the step 74 is already stored on either the terminal or a proxy server connected to the terminal, the display of the banner on the user's terminal is not counted under the first method. Similarly, if a banner requested by a terminal

during the step 90 is already stored on either the terminal or a proxy server connected to the terminal, the display of the banner on the user's terminal is not counted under the second method. The discrepancy between the number of times a banner is actually displayed on a user's terminal and the number of times the display of the banner on the user's terminal is counted can become significant, even reaching error rates of eighty percent or higher.

One solution to the problem is to prevent banner information from being stored or cached on either the user's terminal or the proxy server to which the user's terminal is attached. Therefore, each time a banner is requested by the user's terminal, the banner will have to be downloaded or served from the computer site or information server on which the banner is stored to the user's terminal for display on the user's terminal. For example, the HTTP and HTML protocols allow banners to be tagged or indicated as being uncachable or unstorable at the user's terminal or the proxy server connected to the user's terminal, as will be discussed in more detail below. Therefore, such a solution can be implemented where after each request for banner information, the requested banner information is served from the location storing the banner information, thereby allowing the display of the banner information to be counted accurately at the location at which the requested banner information is stored.

The solution described in the preceding paragraph creates a significant problem, however, that creates even more significant consequences, thereby making its use for accurately counting advertisement and banner displays highly impractical and undesirable. More specifically, the storage of web pages and banner information at the user's terminal or in the proxy server connected to the user's terminal provides several important benefits that will be eliminated by this

simple solution. First, the speed at which the information is displayed on the user's terminal will be reduced since the information will always have to be transmitted or served to the user's terminal for display on the user's terminal each time the user requests the information. If the information had previously been requested by the user such that the information was already stored in the user's terminal or the proxy server connected to the user's terminal, or if the information had previously been requested by a second user at a terminal connected to the same proxy server as the first user's terminal such that information was already stored in the proxy server connected to the first user's terminal, re-requesting the information to be downloaded or served from another device connected to the computer network and the actual serving of the information to the user's terminal will take substantially longer than loading the information already stored in the user's terminal or serving the information to the user's terminal only from the proxy server to which the user's terminal is connected. If the banners contain advertisements, the length of time the banner is displayed to the user may also be critically important to the advertiser. The user may not wait for the banner information to be served and displayed before the user selects another web page, thereby minimizing the success of the banner.

A second and more serious problem created by having to serve the information displayed on the user's terminal each time the information is requested is that the amount of data traffic on the computer network will significantly increase, and can even bring the flow of information to a virtual stop, particularly if all requests for banner information from any terminal connected to the computer network require the information to be transmitted across the computer network to the terminal.

A third problem created with the prior art method 72 is that the step 100 eliminates any possibility of targeting specific information to be displayed with specific web pages. That is, if any demographic or other information about the user or terminal 36 is known by the server on which the banners are stored, the prior art method 72 prevents the server from using the demographic or other information to target the user with a specific banner or to tailor a banner to the specific user. Such targeting or tailoring of banners can be very important when the banners contain advertising information and the advertisers want to send specific advertisement banners to users about whom specific demographic or other information is known.

The method 110 of the present invention solves the initial problem of how to create accurate counts of banner information displays on user terminals while avoiding the problems created by requiring the banner information to be retransmitted across the computer network each time the banner information is requested by a user or a user's terminal, as will now be discussed in more detail in reference to Figure 4. In addition, the method 110 allows for the use of content general and content specific signals, which allow banner displays to be targeted to specific users while taking advantage of the performance gains possible with caching proxy servers, as will also now be discussed in more detail in reference to Figure 4.

In the method 110, the steps 74, 80, 82, 84, 85, 86, and 88 are essentially the same as described above in relation to the prior art method 72 illustrated in Figure 3. Therefore, no further discussion of these steps is required for purposes of explanation of the method 110 of the present invention. After a requested page containing a banner has been displayed on a user's terminal during the steps 78, 84, or 86, and, as determined during banner determination step 88,

if the page contains banners to be displayed on the user's terminal 36 along with the page, an initial request banner signal is generated by the user's terminal 36 during initial banner request step 112. Unlike the previous situation with the method 72, however, the terminal 36 and the proxy server 50 preferably do not check to see if the banner information has already been stored and the terminal 36 and the proxy server 50 preferably cannot stop the initial banner request signal sent by the terminal 36 during the step 112 from being transmitted across the computer network 30. That is, the initial banner request signal sent by the terminal 36 during the step 112 is preferably a mandatory signal to be transmitted across the computer network 30 and that cannot be blocked or terminated by either the terminal 36 or the proxy server 50, even if the banner to be served to the terminal 36 is already stored in either the terminal 36 or the proxy server 50.

The initial banner request signal generated by the terminal 36 during the step 112 preferably does not contain the location information of the desired banner as does the banner request signal generated by the terminal 36 during the request banner step 90 of the prior art method 72. In other words, the initial banner request signal generated by terminal 36 during the step 112 can be a content general signal and may contain only the minimum amount of information needed to tell a designated computer site, information server, or other device which receives the initial banner request signal and on which a banner may or may not be stored or located, only that the terminal 36 desires that an unspecified banner be served to the terminal. The designated computer site, information server, or other device can then select which banner is to be served to the terminal 36. The process of selecting which banner is to be served to the terminal 36 can be made during the optional banner selection step 113, which would occur after the step 112 and

before the step 114 in the method 110 illustrated in Figure 4. If the optional selection step 113 is not used with the method 110, the terminal 36 will request during the step 112 that a specific banner to be served to the terminal 36. If the optional selection step 113 is used with the method 110, the terminal 36 will only request during step 112 that a banner be served to the terminal 36, but the terminal 36 will not specify which banner is to be served to the terminal 36.

Since the designated computer site, information server, or other device should, barring any problems with the computer network 30, always receive the initial request banner signal from the terminal 36 sent during the step 112, the display of the banner on the user's terminal 36 can always be counted and monitored. Instead of returning or serving a banner to the terminal 36, however, the designated computer site, information server, or other device will usually return or send a banner location signal to the terminal 36 during return banner location address step 114 specifying the location address of the banner requested by the terminal 36 (if the optional step 113 is not used) or the banner selected by the designated computer site, information server, or other device (if the optional step 113 is used), to be served to the terminal 36. The signals transmitted during the steps 112 and 114 are very short or small since the signals contain only a small amount of information, particularly when compared to a banner which may contain a large amount of information.

Similar to the process described above for service of the desired page to the terminal 36 during step 76, the terminal 36 first determines if the requested (if the optional step 113 is not used) or the selected (if the optional step 113 is used) banner is already stored in the memory of the terminal 36 during banner storage determination step 92. If the requested or selected banner

is, in fact, already stored in the memory of the terminal 36, the terminal 36 will display the banner during display banner step 94 and the process is over. If the requested or selected banner is not already stored in the memory of the terminal 36, the terminal 36 will generate and send a second banner request signal during send second banner request signal step 116. The second banner request signal sent during the step 116 is essentially the same as the signal sent during the step 96 of the method 72 and, therefore, contains the address of the location of the requested or selected banner so the computer network 30 can properly locate the requested or selected banner.

Since the terminal 36 is connected to the proxy server 50, in a similar manner as described above in relation to steps 82, 84, 86, once the proxy server 50 receives the second banner request signal from the terminal 36, the proxy server 50 will determine whether or not the selected banner is already stored in the memory of the proxy server 50 during banner storage determination step 98. If the selected banner is already stored in the memory of the proxy server 50, the proxy server 50 will transmit the banner directly to the terminal 36 for display by the terminal 36 during serve banner step 100. The terminal 36 may also store the banner in its own memory during the serve banner step 100. If the requested or selected banner is not already stored in the proxy server 50, the proxy server will send the second banner request signal to the location of the banner on the computer network 30 during the send second banner request signal step 118 in a similar manner to the send banner request signal step 102 in the method 72. The device on which the requested or selected banner is stored will then download and serve the banner to the proxy server 50 and the terminal 36 during the serve banner step 104 for display by the terminal 36. Either or both the terminal 36 and the proxy server 50 may store the banner served by the computer site 50

during the serve banner step 104.

When the computer site 46 in the example described above in relation to Figure 4 is a web site using the HTTP and the HTML protocols, as previously described above, the user selects and accesses the web site 46 by entering the Uniform Resource Locator (URL) address of the desired web site 46 into the terminal 36. The page request signal generated by the terminal 36 during page request step 74 tells the computer network 30 which computer or web site the user wishes to access. As previously discussed above, when the requested page is served to the terminal 36 from the web site 46, it may contain the URL addresses of specific banners to be displayed along with the requested web page, or it may contain the URL addresses in a content general format, *i.e.*, the URL address does not specify exactly which banner is to be served to the terminal 36, only that a banner is to be served to the terminal 36. It should be noted that steps 80, 85, 112, 116, and 118 may also include name resolution of the IP address needed to transmit the signals across the computer network to the designated and desired computer web site or information server and these steps should be construed to include such IP address resolution and the use of the Domain Name System (DNS).

Again using the example of the XYZ Company and the web page 60, the web page 60 served to the terminal 36 or loaded by the terminal 36 during steps 78, 84, or 86 may include general content URL addresses for banners or specific content URL addresses for the specific banners 62, 64, 66. A general content URL address for a banner does not provide the necessary information to determine which banner is to be displayed. Rather a general content URL address for a banner only indicates that a banner is to be displayed and the receiver of the signal generated

by the terminal 36 during the step 112 can decide which banner is to be displayed during the selection step 113. A general content URL address for a banner could be of the form http://www.bannersite1.com/image;spacedesc=contentsitename. A server at www.bannersite1.com looks to see if the first word after the name of the site is "image" or any other previously designated word which can be distinguished from an existing file name. It the first word after the name of the site is "image," then the URL address is recognized as a generic request or content general request for a banner, which, as a result, does not specify any particular banner. The server than looks for a space descriptor immediately following the text "spacedesc=" which provides a reference to a section of the server in which banners are stored or located and from where a specific banner can be selected to be served to the terminal 36. The space descriptor field in the general content URL address can reference different groups of banners such as, for example, a collection of car advertisements, a collection of detergent advertisements, etc., depending on the web page providing the general content URL address.

A specific content URL address for a banner does contain the necessary information to determine which banner is to be displayed and the location for the banner. As illustrated in the examples above, the specific content URL address for the banner 62 may be of the form http://www.bannersite1.com/banner1.gif. The "bannersite1.com" portion of the specific content URL address for the banner 62 indicates which device, for example the information server 54, connected to the computer network contains the banner 62 and the "banner1.gif" portion of the specific content URL address for the banner 62 indicates which file stored on the indicated device constitutes the banner 62 and the physical location of the file.

Preferably, the initial banner request signal generated by the terminal 36 during the step 112 is a general content URL address that merely requests a banner to be displayed on the terminal 36, but does not specify which banner is to be displayed. The recipient of the initial banner request signal can then select which banner is to be displayed on the terminal 36 during the selection step 113, thereby allowing targeting and variation in the banners displayed, and return a specific content URL address to the terminal 36 during the step 114 in the form of a Status HTTP 302 Redirect (temporary) signal to the terminal 36 to tell the terminal 36 where the selected banner to be displayed on the user's terminal 36 is located on the computer network 30, *i.e.*, to provide the terminal 36 with the content specific URL address of the selected banner to be displayed on the user's terminal 36. An HTTP 302 temporary redirect signal does not create an association between the general content URL address signal generated by the terminal 36 during the step 112 and the banner to be displayed on the terminal 36 or the response signal sent to the terminal 36 during the step 114. Therefore, even though the banner displayed on the user's terminal 36 may be cached or stored on the user's terminal 36 or on the proxy server 50, the response sent during the step 114 to the general content URL address signal generated by the terminal 36 during the step 112 is not cached. Therefore, the signal sent by the terminal 36 during the step 112 will not be blocked or otherwise prevented from being transmitted over the computer network 30 by either the terminal 36 or the proxy server 50.

An alternative to using only the HTTP 302 Redirect signal is to use, in addition, standard HTML response header tags. More specifically, every time a server responds to a request for a document or page from a client's browser software, the response from the server can contain one or more

response header lines. Each line of the response header describes a different aspect of the response, including its size, the type of content it is (image, text, etc.), a status code, and one or more tags which affect the changing nature of the document and how proxy servers or terminals should deal with the document.

The method 110 of the present invention can use HTML tags to tell proxy servers and terminals that the response sent during the step 114 is not cachable, even if the actual banner eventually served to the terminal is itself cachable. There are many types of tags that can be used for this purpose. For example, the Expiry tag which specifies the date and time beyond which a cached copy of the response is no longer valid. By setting the Expiry tag to a date in the past, the response sent to the terminal 36 during the step 114 will not be considered valid for any further signals sent by the terminal during later steps 112. Therefore, the response sent to the terminal 365 during a previous step 114 is no longer valid and the signal sent by the terminal 36 during the current step 112 cannot be blocked by the terminal 36 or the proxy server 50. Another tag that could be used is the Last-Modified Tag which specifies the last time the response was modified. By setting the Las-Modified Tag for a response as a date far in the past, the terminal or proxy server may consider the response to be too "stale" to be considered valid. A third tag that could be used is the Cache-Control Tags or the obsolete pragma:no-cache tag which informs a receiver of the response that the response is not be cached or stored in the receiver.

Another option for implementing the method 110 of the present invention using standard HTML and HTTP protocols is to incorporate variable components into the links on a web page or hypertext document such that the variable components are incorporated into the general content

URL addresses sent by the terminal during the step 112 . For example, referring to the web page 60 in Figure 2, the hypertext links or URL addresses returned for the banners 62, 64, 66 when the web page 60 is displayed on the user's terminal 36 during steps 78, 84, or 86 can contain a variable component such as, for example, a random number, a time/date stamp, cgi-bin string, or a random page identifier. In this manner, each time the web page 60 is displayed on the terminal 36, the URL addresses for the needed banners 62, 64, 66 will be different. When the terminal 36 sends the initial banner request signal during step 112, the initial banner request signal can incorporate the variable component URL addresses generated when the web page 60 is served or displayed on the terminal 36. Since the variable component URL addresses are, by definition, different every time, the initial banner request signal generated during the step 112 will be different every time, thereby preventing the terminal 36 or the proxy server 50 from blocking the transmission to the computer network 30 of the initial banner request signal generated during the step 112.

Another alternative for implementing the method 110 of the present invention is to use for the general content URL address, an URL address which, though constant, is interpreted by caching proxy servers and/or caching web browsers or terminals to resemble a constantly changing URL address and, as a result, is not cached. More specifically, caching proxy servers exist which will specifically avoid caching content related to any URL address containing the strings "cgi-bin" and "?" which are ~~stings~~ strings conventionally used in the construction of URL addresses for which responses are dynamically generated and, therefore, are unsuitable for caching. It should be noted that a general content URL address using this techniques such as, for example,

http://www.bannersite1.com/cgi-bin/image;spacedisc=contensitename?variable, need not use the cgi-bin directory and need not use the variable after the "?". Since these markers exist in the URL address, some caching proxy servers will be led to conclude that the URL address should not be cached.

In order to speed up the process of downloading, transmitting, or serving a specific banner from an information server to the terminal 56, the content specific URL address of the requested or selected banner sent to the terminal during step 114 can contain the exact Internet Protocol (IP) address of the requested or selected banner. For example, instead of providing the specific content URL address for the banner 62 as http://www.bannersite1.com/banner1.gif, the specific content URL address for the banner 62 could be provided as, for example, http://236.45.78.190/banner1.gif, thereby removing any need to use the Domain Name System (DNS) to convert the alphanumeric address "www.bannersite1.com" of the information server to its exact IP address. The use of content general and content specific URL addresses and IP addressing is well known to people of ordinary skill in the art and need not be explained in any further detail for purposes of the present invention.

The method 110 of the present invention has particular application to the advertising industry, as will now be discussed in more detail. While the previous discussions in regard to the prior art method 72 and the method 110 of the present invention have indicated that the banner information can be located on either the computer or web sites connected to a computer network or information servers connected to the computer network, the conventional practice in the advertising business is to have all of the banners located on one or more information or ad servers,

such as the information servers 54, 56, 58. As previously discussed above, advertising agencies create the banners and then arrange or contract to have the banners be associated with web pages or web sites such that when users access the web sites and the web pages are displayed on the user's terminal, the banners are also displayed on the user's terminal. While the advertisements can be stored on the computer or web sites connected to the computer network, it is typically more convenient for the advertisements to be centrally stored on an information or ad server, particularly if the advertisements change or the advertisers want to target specific advertising banners to specific users. Therefore, when a web page requested by the user is served to the user's terminal and the web page contains advertising banners, the web page will often include the address information for the advertising banner to be displayed in conjunction with the requested web page so that the terminal can request the serving of the advertising banners. By keeping the advertising banners centrally located in an information server, the advertiser can keep each advertising banner's address information included in the web page constant while changing the actual advertising banner associated with the banner address information. In addition, the generation of content general URL addresses during the step 112, the selection of banners to be displayed by a central or primary information server during optional step 113, and the return of content specific URL addresses during the step 114 allow the advertiser to rotate and change the advertising banners displayed to users. Furthermore, if the device receiving the initial banner request signal generated by a user's terminal during step 112 has any demographic or other information about the user, the use of content general URL addresses and content specific URL addresses in the method 110 allows the device sending the banner location signal during step 114

to select an advertising banner targeted to the particular user during the step 113, thereby increasing the appeal and success of the advertising banner. In contrast, the prior art method 72 previously discussed above does not utilize content specific and content general URL addressing. Nor does the prior art method allow for the selection or targeting of banners to be made by an information server.

The prior art method 72 also does not allow each display of the banners associated with a page to be counted, while the method 110 of the present invention specifically allows for each such display of a banner to be counted and monitored. More specifically, allowing the user's terminal or proxy server connected to the user's terminal to terminate or block a banner request from the user's terminal (created during step 90) when the banner is already stored in either the user's terminal or the proxy server connected to the user's terminal in the prior art method 72 prevents accurate banner display counts to be made. In contrast, the method 110 of the present invention specifically allows each banner display to be counted by preventing the user's terminal or the proxy server connected to the user's terminal from terminating or blocking the initial banner request signal (created during step 112) from reaching the information or ad server in which the desired banner is stored or which is controlling the selection of the banner to be served to the terminal.

In addition to the advantage of the method 110 described above, a significant feature of the method 110 of the present invention is that it does not significantly impact the operation or efficiency of the computer network 30. While the initial banner request signal created by the terminal during the step 112 and the banner location signal generated during the step 114 are

additional signals created in the method 110 that are not created in the prior art method 72, thereby creating additional data traffic and overhead on the computer network 30, the initial banner request signal and the banner location signal are both extremely small, often comprising no more than a single packet or one-hundred to two-hundred bytes. Therefore, the overhead created by the additional banner signal during the step 112 and the banner location signal during step 114 is negligible. More importantly, since the method 110 still allows the web pages and the banner information to be cached or stored in the terminals and proxy servers, there is no unnecessary retransmission of the web pages or banners from the computer or web sites or the information or ad servers to the terminals which would significantly increase the data traffic and overhead on the computer network 30.

In a second embodiment of the method 110 of the present invention, multiple information servers storing the banner information used in conjunction with the displays of web pages on user terminals are connected to the computer network. Using mirror information servers allows for banners to be distributed faster to user terminals and increases the reliability of the method 110. For example, the computer network 30 illustrated in Figure 1 includes a primary information server 54 and mirror information servers 56, 58 which preferably contain a duplicate of the banners stored on the primary information server 54. When the terminal 36 creates and sends the initial banner request signal during the step 112, the initial banner request signal is preferably configured so that it sent to and received by the primary ad or information server 54 which in turn creates and sends the address location information of a selected banner to the terminal 36 during the step 114. The selected banner is preferably stored at the primary information server 54 and

at also the mirror servers 56, 58. The address location information for the banner sent by the primary information server 54 to the terminal during the step 114 is preferably includes the address location for the banner at the information server best suited to handle a transmittal of the banner to the terminal 36 or includes other information with which the terminal 36 can determine the best suited information server to serve the banner. Typically, the information server best suited to handle the serving or transmittal of a banner to the terminal 36 will be the information server that can download or serve the banner to the terminal 36 in the shortest period of time. Other selection criteria can be used, however, in determining which information server is best suited to download or serve a banner to a terminal, including the network topological distance between the terminal 36 and the information servers, the geographical distance between the terminal 36 and the information servers, the bandwidth of the information servers, or the round trip times for a message between the terminal 36 and the information servers. The use of a primary information server and mirror information servers allows all of the intelligence, databases, banner display counting processes, etc. for operating the method 110 of the present invention to be stored and operated in a single location, *i.e.*, the primary information server, while allowing mirror information servers to be little more than network accessible memory devices or servers on which the banners are stored. Many Internet Service Providers (ISPs) and other network service providers connected to computer networks will provide memory space and will store documents and other files for access and retrieval from the computer network for relatively low cost and such storage capabilities are easy to implement and maintain.

As a further example, suppose that the user at the terminal 36 sends an initial banner

request signal to the primary information server 54 during the step 112 and the primary information server selects a banner to be served to the during step 113. If desired, the primary information server 54 can update the count information for the particular banner selected to be displayed on the user's terminal 36. The primary information server 54 may determine that the mirror information server 56 is best suited for serving the selected banner to the terminal 36 since the mirror information server 56 can serve the selected banner to the terminal 36 in the shortest period of time. Alternatively, the primary information server 54 may determine that either it, the mirror information server 58, or some other information server (not shown) connected to the computer network 30 can serve the selected banner to the terminal 36 in the shortest period of time. The information servers 54, 56, 58 may themselves be separated geographically or topologically such that every terminal connected to the computer network 30 has an optimal information server from which banners can be served, even if the terminals are scattered across a wide geographical or topological area. Therefore, for example, the terminal 36 may be optimally served by the mirror information server 56 while the terminal 32 may be optimally served by the primary information server 54 and the terminal 44 is optimally served by the mirror information server 58. When the primary information server 54 has determined which information server is best suited to handle the serving of the selected banner to the terminal 36, the primary information server 54 will return the banner location address for the selected banner at the selected information server to the terminal 36 during the return banner location address step 114. The terminal 36 can then request that the selected banner be served from the selected information server during the steps 98, 100, 104, 116, and 118 for display at the terminal 36.

As previously discussed above, the selection of which mirror information server is the best suited for serving a particular banner to a particular terminal can be made a variety of ways. The criteria to be considered can include precision, *i.e.*, the accuracy of the determination of which information server is best suited to serve a particular banner to a particular terminal, the ease of implementation, and the time required for the primary information server to make the determination of which information server is best suited to serve a particular banner to a particular terminal. The decision can be made by either the primary information server or by some other method.

As one example implementation of the decision criteria implemented in a primary information server, a table or matrix can be stored and maintained at the primary information server 54 which showing the relationship between each information server 54, 56, 58 and the particular terminal. The matrix preferably contains the round trip times for messages sent back and forth between each information server and the terminal. The information in the matrix can be updated continuously or periodically as desired. This information server determination method has several advantages. First, with such a matrix stored at the primary information server, the primary information server can quickly and accurately determine which information server is best suited to serve a particular banner to a particular terminal. Also, the time for the primary information server to make a decision is very fast and does not require additional searches of the computer network 30. Furthermore, the primary information server will know exactly which information server served each and every banner to every terminal on the computer network, which can be very valuable for evaluating the efficiency of the method 110.

This information server determination method described above does, however, also have several disadvantages. First, a significant effort is needed to generate the matrix and the information stored in the matrix, particularly if the computer network is quite large. More specifically, this method requires that monitoring software and/or hardware be operating at each information server to measure the round trip times between the information servers and the terminals. In addition, the matrix at the primary information server will need to be updated with the information created by the monitoring software and hardware at the mirror information servers so that accuracy of the matrix is maintained. Since the computer network may be continuously changing or evolving as new devices and networks are connected or disconnected from the computer network, and portions of the computer network may become temporarily disabled or offline, the overhead of monitoring the round trip times can be significant. The ability to create a matrix with the round trip times between all of the information servers and all of the terminals may take too long to develop, particularly if there is a significant number of terminals that do not ever request a banner stored on the information servers. This problem can be reduced by assuming that the round trip time between an information server and a particular terminal is the same, or at least approximately the same as, for example, other terminals connected to the same proxy server, the same as other terminals connected to the same sub-network, or the same as other terminals in a /24 network (a set of 256 contiguous IP addresses).

Another method in which the information server is best suited for serving a particular banner to a particular server uses and takes advantage of the Domain Name System (DNS) already being implemented on the Internet. As previously discussed above, DNS is a system for resolving

or determining the thirty-two bit Internet Protocol (IP) addresses for each host computer or network device on the computer network. Every time a signal is generated by terminal or other device connected to the computer network requesting access to, or communication with, another device on the computer network, the IP address for the desired device must be determined if the signal does not already contain the IP address.

The DNS process is very complex and so a complete description of it is beyond the purview necessary for a complete understanding of the present invention. In addition, the DNS process is well known to people of ordinary skill in this art. For purposes of a general explanation of how the DNS process can be used for selection of the information server to serve a banner to a particular terminal, the DNS process uses name servers or resolvers located in the computer network to determine the IP addresses. The name servers maintain listings of each computer or device in the computer network and their IP addresses. If a particular name server does not know a specific IP address when it is queried for the IP address, the name server can forward the query to another name server. Once the correct IP address is determined, it is passed along the reverse path to the terminal and is stored on all name servers who received the query and forwarded the query along.

With the present invention, each information server 54, 56, 58 operates a name server. Furthermore, each name server is configured to respond to a DNS request with the IP address of the information server containing the name server. When the banner location signal is returned to the terminal 36 during the step 114 from the primary information server 54, the banner location signal contains a reference or general URL address of the banner to be served to the terminal, but

not the specific IP address. The terminal 36 then initiates a DNS name resolving process prior to step 116 to determine the information server from which to serve the desired banner. Upon receiving the name resolving request from the terminal 36 or its nearby DNS name server, over the course of several transactions, each of the name server in each information servers returns an IP address to the terminal containing the IP address of the information server in which the name server is located. That is, name server in the information server 56 returns the IP address of the information server 56, while the name server in the information server 58 returns the IP address of the information server 58, etc. All of the IP addresses becomes stored in the DNS name server closest topologically to the terminal 36 since that DNS name server would have been the first name server to receive the name resolution request from the terminal 36. The DNS name server keeps a list of all of the IP addresses for all of the information servers and the round trip times for communications between the DNS name server and the name servers located at the information servers. The round trip times are initially set to zero. When the DNS name server gets a request from the terminal 36, it selects the information server having the shortest round trip time and provides the terminal 36 with the IP address of the selected information server. Since initially all of the round trip times are set to zero (0), the DNS server will randomly select one IP address and return it to the terminal 36. The DNS name server will then monitor the round trip time between DNS server and the information server and update DNS name server's round trip time list for the particular information server's IP address returned to the terminal 36. The next time the terminal 36 requests name resolution from the DNS server, the DNS name server will return the IP address of a different information server since the round trip time of the first information server will no

longer be zero (0). After this process is implemented at least as many times for each terminal or each specified group or domain of terminals as there are information servers, the best information server for serving banners to the terminals or groups or domains of terminals will be determined and the appropriate IP addresses will be returned to the terminal requesting the DNS process. The standard DNS process includes ways for insuring that the route trip times are updated so that particular terminals are not locked into always receiving banners from particular information servers if other information servers become better suited for serving banners to the particular terminals.

This second information server determination method described above has several advantages. Unlike the first method described above, this method takes advantage of the already existing DNS process and requires no special monitoring or sniffing software or hardware to be installed at the information servers. Also the second method does not require a matrix to be generated and stored in the primary information server or updates to a matrix to be made. In comparison, the operation of a name server at each mirror site is simple to implement and operate. Therefore, in contrast to the first method, the second method is easy and relatively inexpensive to implement. Unfortunately, in contrast to the first method, the second system may be less precise and take longer to implement since a DNS search or rotation process will have to be implemented each time a banner is to be served to a terminal. In addition, until the round trip times for each information server are determined, the second method may produce less than optimal results. Furthermore, updating of the round trip time information may require using an information server other than the optimal information server to serve a particular banner to a

particular terminal. Finally, the shortest round trip time between the DNS name server and the name servers at the information servers may not be an accurate reflection of the round trip times between the terminal and the information servers, particularly if a given user's DNS name server is topologically distant from the terminal. As a result, the information server selected by the DNS name server may not always have the shortest round trip time to the terminal.

Other methods for determining which information server is best suited to serve a particular banner to a particular terminal include looking at the information, if any, about the terminal received in the initial banner request signal generated during step 112. The information might include things such as the country code or the network code in which or on which the terminal resides. In addition, the information might include information about how the initial banner request signal was routed from the terminal to the primary information server, thereby giving an indication of the topological location of the terminal in the computer network. The primary information server can then use this information dynamically or in conjunction with a matrix look-up process to determine which information server to select to serve the selected banner to the terminal requesting a banner.

Another important benefit of mirroring is that it allows for redundancy and back-up if one or more of the information servers connected to the computer network 30 goes offline or becomes otherwise inaccessible or incapable of serving banners to terminals. For example, in the preferred method, the initial banner request signal is preferably sent by a terminal to the primary information server 54 during the send initial banner request signal step 112, thereby allowing the primary information server 54 to be the centralized source of intelligence and the centralized source of

banner display monitoring and counting. If however, the primary information server 54 becomes disabled or goes offline for any reason, one of the mirror information servers 56, 58 can temporarily or permanently become the primary information server for the computer network 30, thereby allowing the delivery of banners to terminals to continue. Preferably, the switch from the disabled primary information server 54 to the back-up information server 56 or 58 can take place very quickly such that little impact on the delivery of banner information is noticed or even created. It should be noted, however, that the backup primary information server will need to contain all of the centralized intelligence, databases, banner counting and monitoring software, etc. operating on the original primary information server 54 such that the backup primary information server can operate appropriately if the original primary information server 54 becomes disabled or goes offline.

The switch over to the backup primary server can be handled in a variety a ways. For example, once again taking advantage of the Domain Name System (DNS) process and Internet Protocol (IP) addresses, both the primary information server and the backup information server will operate a name resolver or name server such that when the initial banner request signal is generated during the step 112 that does not contain the needed IP address, the IP address for the primary information server is returned to the terminal 36 and stored in all name servers receiving and processing the query for the IP address of the primary server. The backup information server will monitor the primary information server and, in the event that the primary information server goes offline or becomes otherwise disabled, the backup information server will shut down or disable the name server at the primary information server. Furthermore, the backup information

server will begin returning its IP address instead of the IP address of the primary information server when queries are received. All IP address information stored in name servers has a time-to-live (TTL) value that is set by the name server returning the IP address. When the TTL value expires, the IP address information is no longer stored in the name server and the name server will have to forward any requests it receives for the IP address. Therefore, when either of the name servers in the primary information server or the backup information server returns an IP address for the primary information server, the IP address is set to have a finite TTL value of, for example ten to thirty minutes. In the event of the primary information server going offline, eventually the IP addresses for the primary information server stored in the name servers will expire and queries for the IP address will reach the name server in the backup information server which will then return its IP address instead of the IP address of the primary information server. Thus, within a finite time and selected TTL, all name servers in the computer network that have stored or cached the IP address of the primary information server will have their caches or memory cleared. They will then ask for new addresses and receive the IP addresses of the backup information server in response.

The use of a centralized primary information server along with at least one mirror information server on a computer network provides significant advantages for the delivery of banners containing advertising information to a terminal for display on the terminal. First, advertising banners are in most cases going to be delivered to the terminal requesting the advertising banner in quick and efficient manner since the information server best suited for delivering and serving a banner to a terminal will in most cases be the information server selected

by the primary information server to deliver the banner to the terminal. The faster the advertising banner is delivered to a terminal, the more likely the user at the terminal is to look at the advertising banner, particularly if the advertising banner is displayed on the user's terminal for a longer period of time before the user exits the web page or selects a new page. In addition, mirroring of information servers allows for the relatively fault tolerant delivery of advertising banners to users at the terminals, thereby reducing or even eliminating lost opportunities to display advertising banners on terminals when the primary information server becomes disabled or otherwise goes offline. Furthermore, centralizing the intelligence at a primary information or ad server allows the displays of advertising banners to be continuously and accurately monitored, thereby increasing the ability to judge the success or failure of specific advertising banners.

The foregoing description is considered as illustrative only of the principles of the invention. Furthermore, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and process shown and described above. Accordingly, all suitable modifications and equivalents may be resorted to falling within the scope of the invention as defined by the claims which follow. For example, while the method 110 of the present invention is directed primarily to the accurate counting of banner information displayed with web pages, the method 110 can also be used to provide an accurate count of the number of times specific web pages are displayed on a user's terminal by creating a send initial page request signal step in a similar manner to the send initial banner request step 112 and a return page address location step in a similar manner to the return banner location step 114 prior to the storage determination step 76. In addition, while the method

110 of the present invention has been described with connections to the computer network 30 being made primarily by terminals, computers, and proxy servers, it should be appreciated that the method 110 will also be suitable for use with other devices connected between the user's terminal and the computer network may exist which can cache or store the web pages or the banner information.

As yet another example of how the method 110 can be modified, if a primary information server receiving the initial banner request signal generated by a terminal during step 112 determines that the primary information server itself is the information server best suited for downloading or serving a selected banner to the terminal, the primary information server may, instead of sending a banner location signal to the terminal during the step 114, simply transmit the selected banner to the terminal directly, thereby eliminating some of the steps in the method 110.

As yet another example of how the method 110 of the present invention can be modified, it is possible to move the steps 112 and 114 to between the steps 92 and 116 in Figure 4 so that the steps 112 and 114 are no longer performed after step 88 and before step 92. The steps 112 and 114 are instead implemented after the step 92 and before the step 116 if the answer in step 92 is "no". In this embodiment, web pages and banners that are stored in a user's terminal are automatically reloaded and displayed on the user's terminal without generating additional signals on the computer network. Therefore, if a user "backs" through a page, *i.e.*, the user moves through a series of pages, each of which are displayed on the user's terminal and stored in the terminal's memory along with the page's associated banners, and then decides to review or redisplay some of the pages (such as by using the "back" function of the browser software

operating on the user's terminal), no initial banner request signal is generated during the step 112 since the steps 88, 92, 94 will be followed in sequence. While this embodiment of the method 110 of the present invention does not allow the redisplay of the banners on the same terminal (and presumably to the same user) to be counted or monitored, it still allows the redisplay of banners stored in the proxy server, but which are requested to be displayed on different terminals (and presumably to different users), to be counted and monitored.

While the method 110 of the present invention has been discussed in detail primarily with the counting, monitoring, and targeting of advertising or other content over computer networks, the method 110 can also be used for the counting, monitoring, or targeting of content or banners over local area networks, e-mail networks, and non-computer networks such as switched-network cable television. In addition, the method 110 can easily be implement to monitor levels of content sophistication, content language, content type, content levels of summarization, etc. when different content options are selectable by a user or terminal.

It should also be noted that, while the terms information server, computer site, web site, server, media property have been used to describe the method 110 of the present invention, the terms have been used only to help clarify different portions of the method 110. Thus, an information server could also function as a computer site, a computer site could also function as an information server, and both could be labeled generically as servers. The method 110 of the present invention, therefore, should not be limited by the terminology used to describe different aspects of the present invention.

CLAIMS

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A method for storing information on a primary server and one or more secondary servers and on computer sites connected to a computer network, wherein information delivered over the computer network to a terminal or a group of terminals may contain references to other information to be delivered to the terminal, comprising the steps of:

serving a first portion of the information to the terminal, wherein said first portion of the information contains a reference to a second portion of the information;

sending a first request signal from the terminal to the primary server requesting a location address for said second portion of the information from which said second portion of said information can be served to the terminal;

sending a location signal from the primary server to the terminal providing said location address of said second portion of the information;

sending a second request signal from the terminal containing said location address

of said second portion of the information and requesting said second portion of the information be served to the terminal; and

serving said second portion of the information to the terminal.

2. The method of claim 1, wherein said first request signal is not blocked from reaching said primary server by either the terminal or any intermediary device located topologically between the terminal and the primary server as a result of previous caching of said first portion of the information or said second portion of the information in the terminal or said intermediary device.

3. The method of claim 2, wherein said second portion of the information is served from the primary or secondary servers.

4. The method of claim 1, wherein said first request signal is a content general request signal.

5. The method of claim 4, wherein said second request signal is a content specific request signal.

6. The method of claim 1 wherein said second portion of the information is served from one of the secondary servers.

7. The method of claim 1, wherein after the primary server receives the first request signal from the terminal, further including the step of determining which server connected to the computer network is best suited for serving said second portion of the information to the terminal.

8. The method of claim 8, wherein results of said determination step are included in said location signal sent from the information server to the terminal.

9. The method of claim 8, including the steps of creating a matrix of selections between each of the terminals or groups of terminals and each of the servers and using said matrix to determine which of the servers is best suited to serve said second portion of the information to the terminals or groups of terminals.

10. The method of claim 9, wherein said selections contain round trip times between the servers and the terminals or groups of terminals.

11. The method of claim 1, including the step of making one of the secondary servers a new primary server if the original primary server becomes inaccessible.

12. The method of claim 1, including the step of storing said second portion of the information in the terminal.

13. The method of claim 12, including the step of determining whether said second portion of information is stored in the terminal before said step of sending said second request signal.

14. The method of claim 4, including the step of selecting the composition of said second portion of the information.

15. The method of claim 14, wherein the results of said composition selection step are included in said location signal sent from the information server to the terminal.

16. A method for distributing a banner over a computer network to a device when the banner is referenced in a hypertext document served to the device, wherein the banner is stored in one or more servers, comprising the steps of:

sending a first banner request signal from the device to a first server requesting that

a banner be served to the device;

sending a banner location signal from said first server to the device, wherein said banner location signal includes location information for a specified banner stored on a second server; and

sending a second banner request signal from the device to said second server requesting that the second server serve said specified banner to the device.

17. The method of claim 16, wherein said second server is said first server.

18. The method of claim 16, including the step of determining which of the servers is best suited for serving said specified banner to the device.

19. The method of claim 18, wherein said step of determining which of the servers is best suited for serving said specified banner to the device is performed in said first server after said first server receives said first banner request signal from the device.

20. The method of claim 16, wherein said first banner request signal is a content general banner request signal.

21. The method of claim 20, wherein said second banner request signal is a content specific banner request signal.

22. The method of claim 16, including the step of storing said specified banner in said device.

23. The method of claim 22, including the step of determining whether said specified banner is stored in the device before said step of sending said second banner request signal.

24. The method of claim 16, including the step of selecting said specified banner prior

to sending said banner location signal from said first server to the device.

28. The method of claim 16, wherein all of the banner information stored on said first server is also stored on said second server.

26. The method of claim 16, wherein said first banner request signal is not blocked from reaching said first server by either the device or any intermediary server located topologically between the computer and said first server as a result of previous caching of said specified banner in the device or said intermediary server.

27. A method for serving a web page and an associated banner to a computer running browser software, wherein the web page contains links to the banner, comprising the steps of:

serving the web page to the computer for display by the browser software;

sending a banner request signal from the computer to a primary server requesting a banner be served to the computer, wherein said banner request signal includes the Uniform Resource Locator address for said primary server;

determining which specified banner will be served to the computer; and

sending a banner location signal from said primary server to the computer, wherein said banner location signal includes the Uniform Resource Locator address for a device on which the specific banner to be served to the computer is stored.

28. The method of claim 27, wherein said banner request signal includes a content general Uniform Resource Locator address.

29. The method of claim 27, including the step of determining whether said specified banner is stored on the computer.

30. The method of claim 29, wherein after said step of determining whether said specified banner is stored on the computer, if said specified banner is not stored on the computer then including the step of sending a specified banner request signal to said device requesting that said device serve said specified banner to the computer.

31. The method of claim 30, including serving the specified banner from said device to said computer.

32. The method of claim 27, wherein said banner location signal constitutes an HTTP 302 redirect signal.

33. The method of claim 28, wherein said banner location signal includes a content specific Uniform Resource Locator address for the specified banner.

34. The method of claim 27, including the step of tagging said specified banner as being cachable.

35. The method of claim 27, wherein said device is said primary server.

36. A method for distributing a banner over a computer network to a device when the banner is referenced in a hypertext document served to the device, wherein the banner is stored in one or more servers, comprising the steps of:

sending a first banner request signal from the device to a first server requesting that a banner be served to the device, wherein said first banner request signal is not blocked by the device or any intermediary server located between the device and said first server as a result of a previous storage in the device or said intermediary server of a response to said first banner request signal sent from said first server to the device;

determining if said first server is best suited to serve said banner to the device and serving said banner to the device if said first server is best suited to serve said banner and sending a banner location signal from said first server to the device, wherein said banner location signal includes location information for a specified banner stored on a second server;

sending a second banner location request signal from the device to said second server requesting that the second server serve said specified banner to said device; and

serving said specified banner to said device from said second server.

37. A method for distributing a banner over a computer network to a device when the banner is referenced in a document served to the device, wherein the banner is stored in one or more servers connected to the computer network, and the device is connected to the computer network via an intermediary server, comprising the steps of:

sending a first banner request signal from the device to a first server requesting that a banner be served to the device;

sending a banner location signal from said first server to the device, wherein said banner location signal includes location information for a specified banner stored on a second server; and

determining if said specified banner is stored on the device and, if said specified banner is not stored on the device, then sending a second banner request signal from the device to the intermediary server and determining if said specified banner is stored on the intermediary server, wherein if said specified banner is not stored on the intermediary

server, sending said second banner request signal to said second server requesting that said second server serve said specified banner to said device.

38. The method of claim 37, wherein said second server is said first server.

39. The method of claim 37, wherein said first banner request signal is a content general request signal.

40. The method of claim 39, wherein said second banner request signal is a content specific request signal.

41. The method of claim 37, indcluding the step of having said first server select said specified banner.

42. The method of claim 37, wherein said first banner request signal is unblockable by either the device or the intermediary server as a result of a storage in the device or the intermediary server of said specified banner prior to the generation of said first banner signal by the device.

ABSTRACT OF THE DISCLOSURE

A system for storing information on a computer network and allowing the information to be accessed by terminals connected to the computer network, either directly, or through an intermediary device such as a local or proxy server, includes computer or web sites which store pages requested by terminals for display on the terminals. The pages may include references to banners to be displayed in conjunction with the web pages on the terminal. The terminal initiates access or connection to a desired computer or web site to access a desired page. After the desired page is downloaded, transmitted, or served to the terminal from the computer or web site, the terminal initiates and sends an initial banner request signal to an information server. The information server returns a redirect signal to the terminal telling the terminal the location of the desired banner on the computer network, which may be the information server, the computer site, or some other information server, computer site, or location accessible via the computer network. The terminal then initiates a second banner request signal to the location of the desired banner and the banner is served to the terminal for display on the terminal, unless the requested banner has previously been stored or cached in the terminal's memory or in the memory of a local or proxy server connected to the terminal, in which case the second banner request signal is not sent across the computer network and the banner is loaded directly from the terminal's memory or served to the terminal from the proxy server.

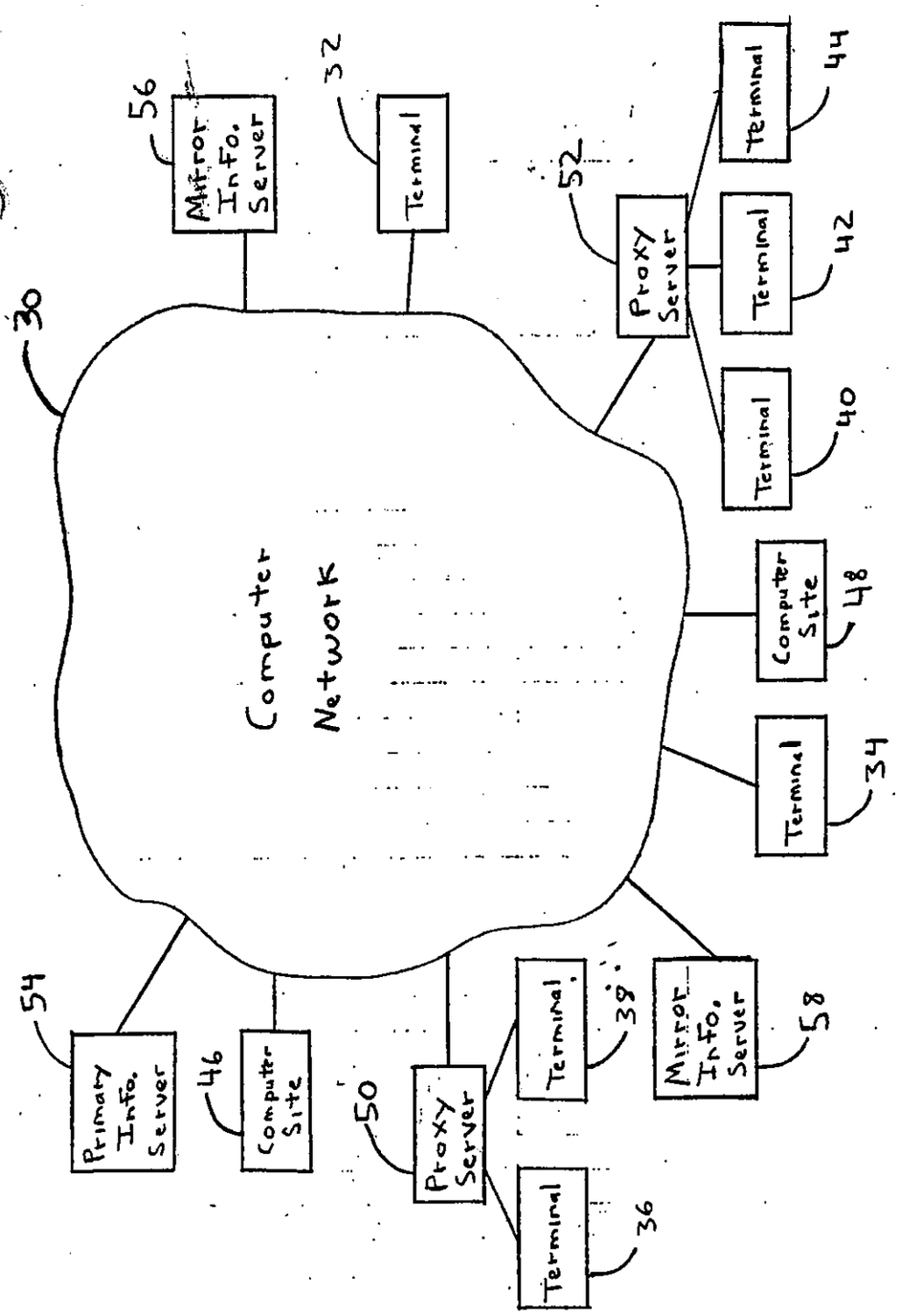

Computer Network
30
Mirror Info. Server
56
Terminal
32
Proxy Server
52
Terminal
44
Terminal
42
Terminal
40
Computer Site
48
Terminal
34
Mirror Info. Server
58
Terminal
38
Proxy Server
50
Terminal
36
Computer Site
46
Primary Info. Server
54

FIGURE 1

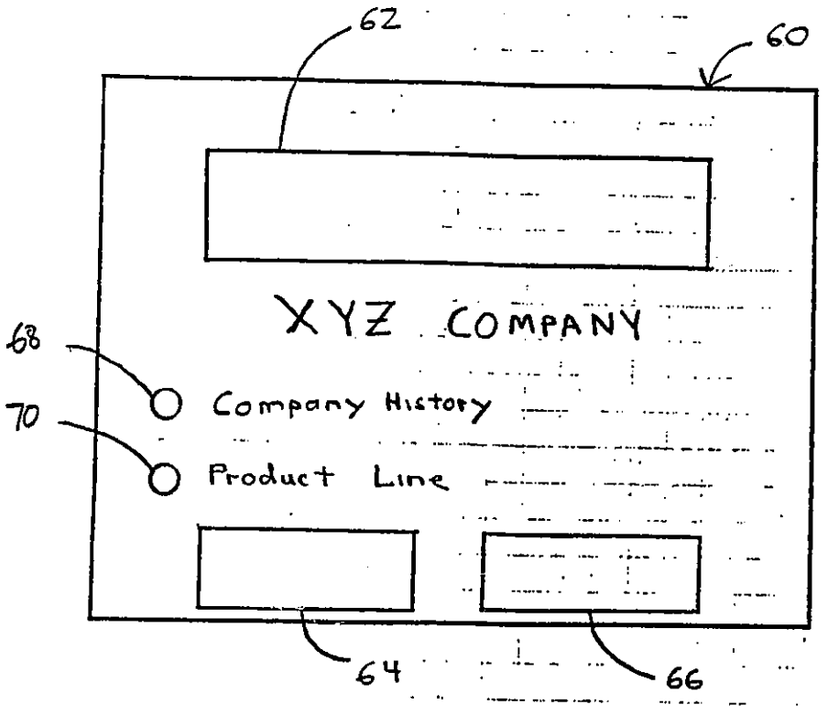


FIGURE 2

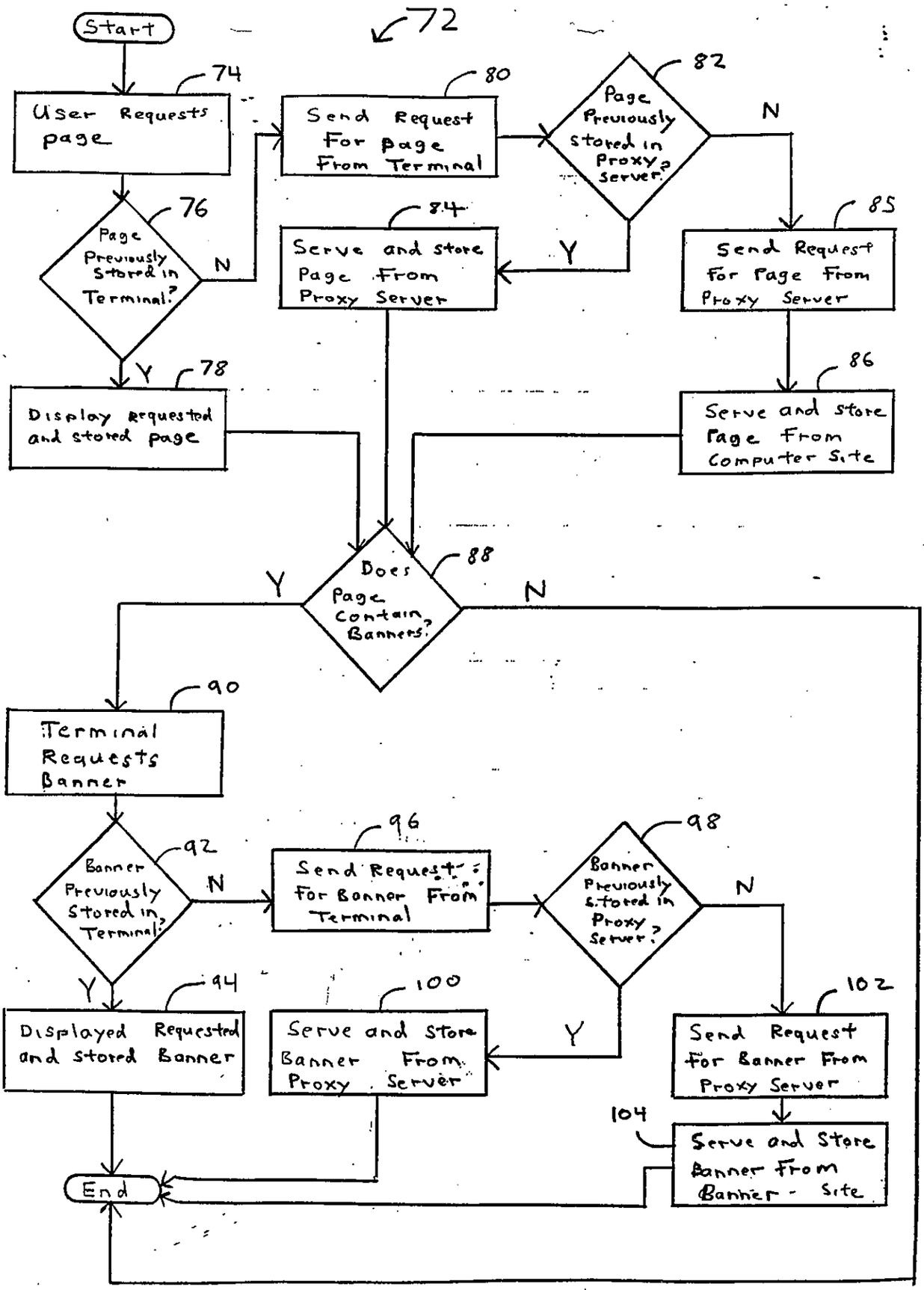


FIGURE 3
(PRIOR ART)

Express Mail No.: EM484077838US

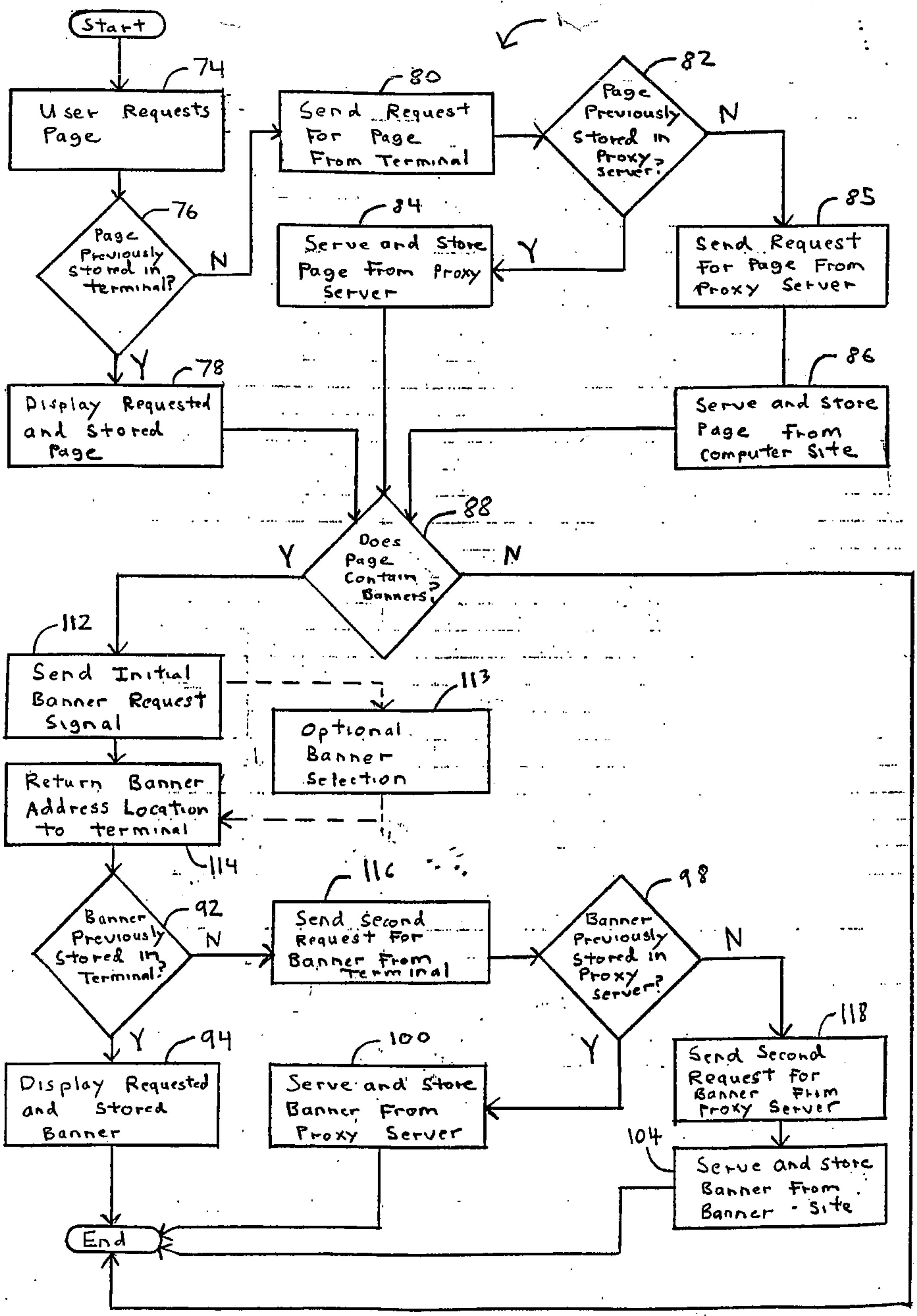


FIGURE 4

PRINT OF DRAWINGS
AS ORIGINALLY FILED

Express Mail No.: EM484077838US

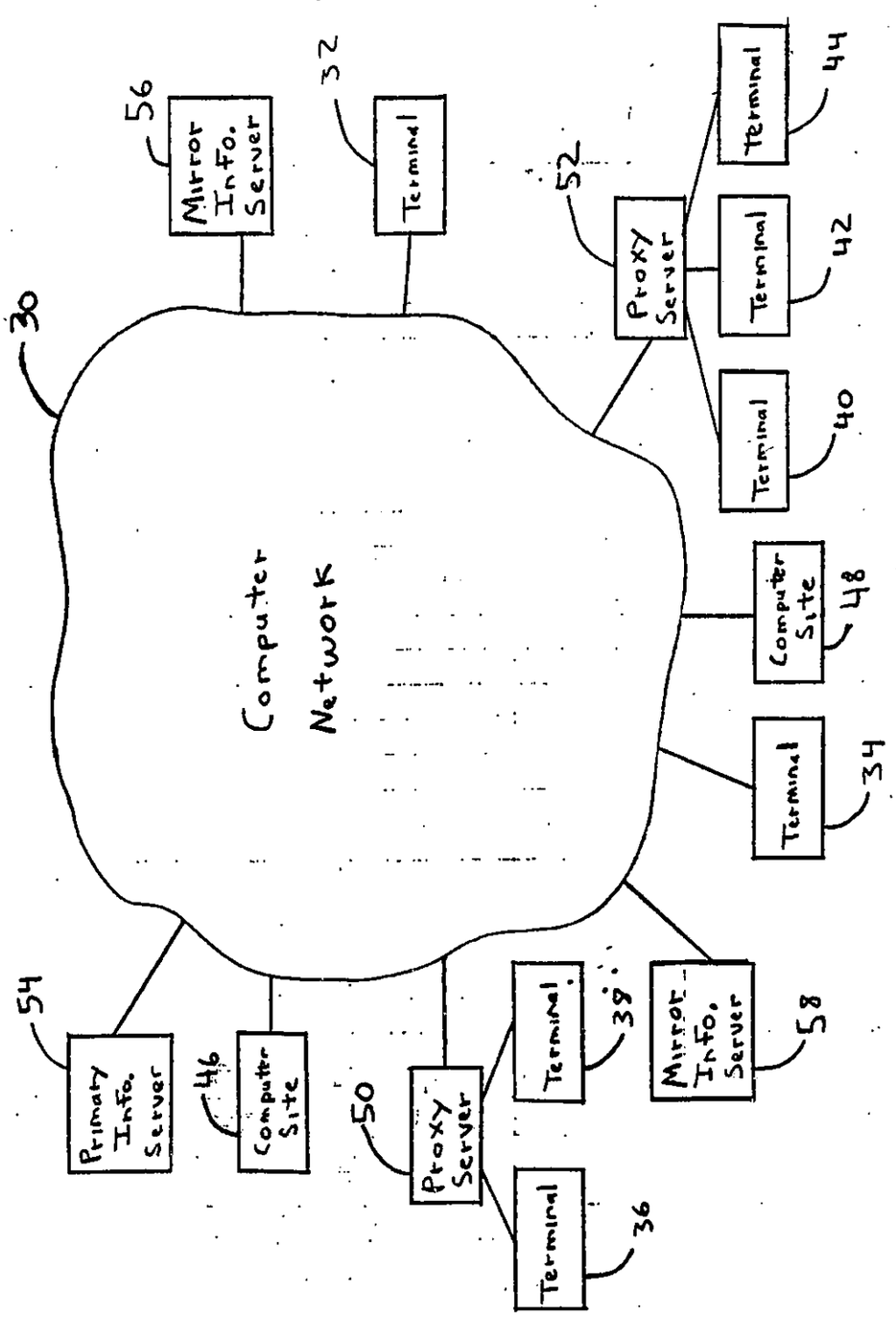


FIGURE 1

PRINT OF DRAWINGS
AS ORIGINALLY FILED

Express Mail No.: EM484077838US

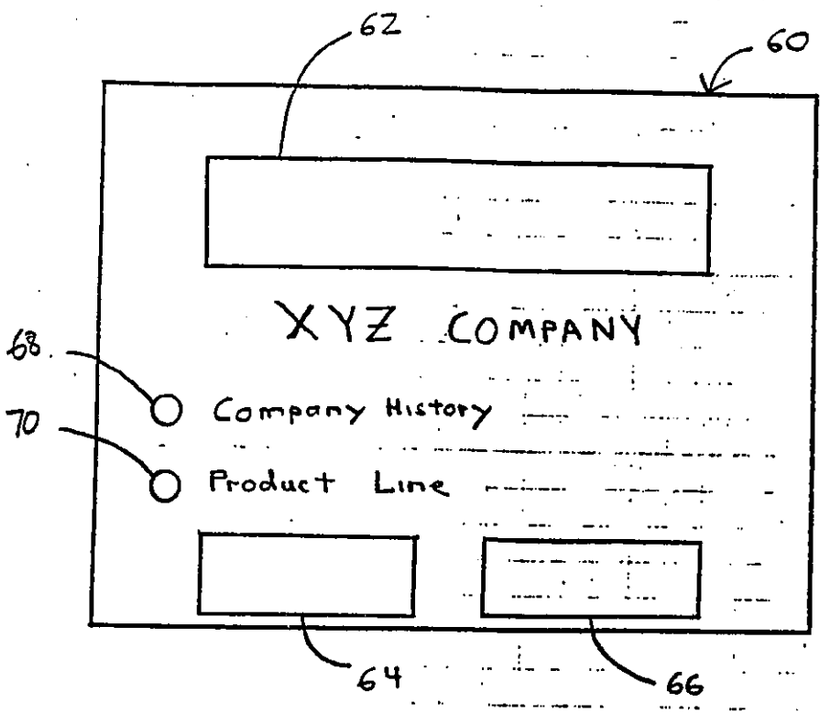


FIGURE 2

PRINT OF DRAWINGS
AS ORIGINALLY FILED

Express Mail No.: EM484077838US

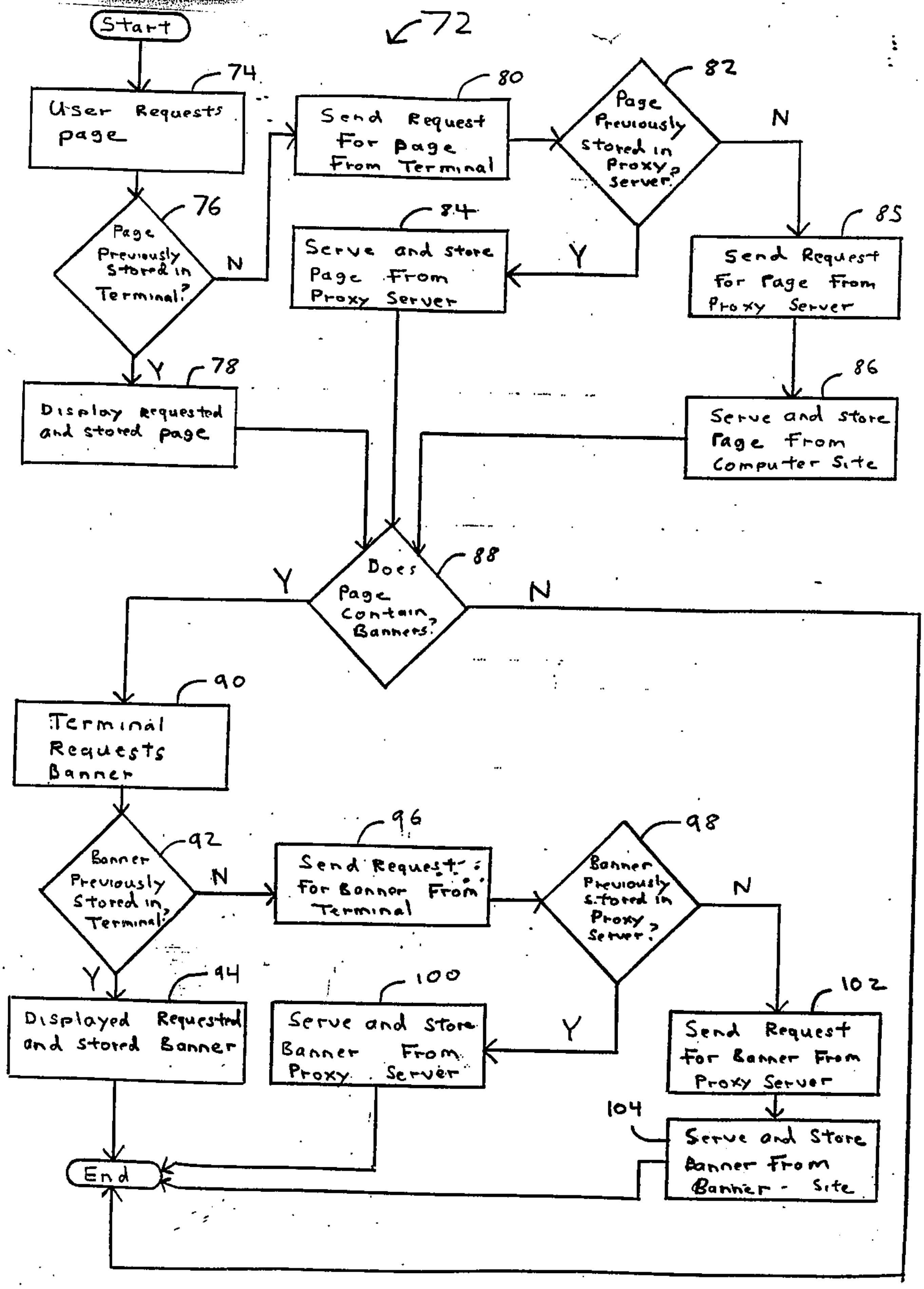


FIGURE 3
(PRIOR ART)

09695850 .050197

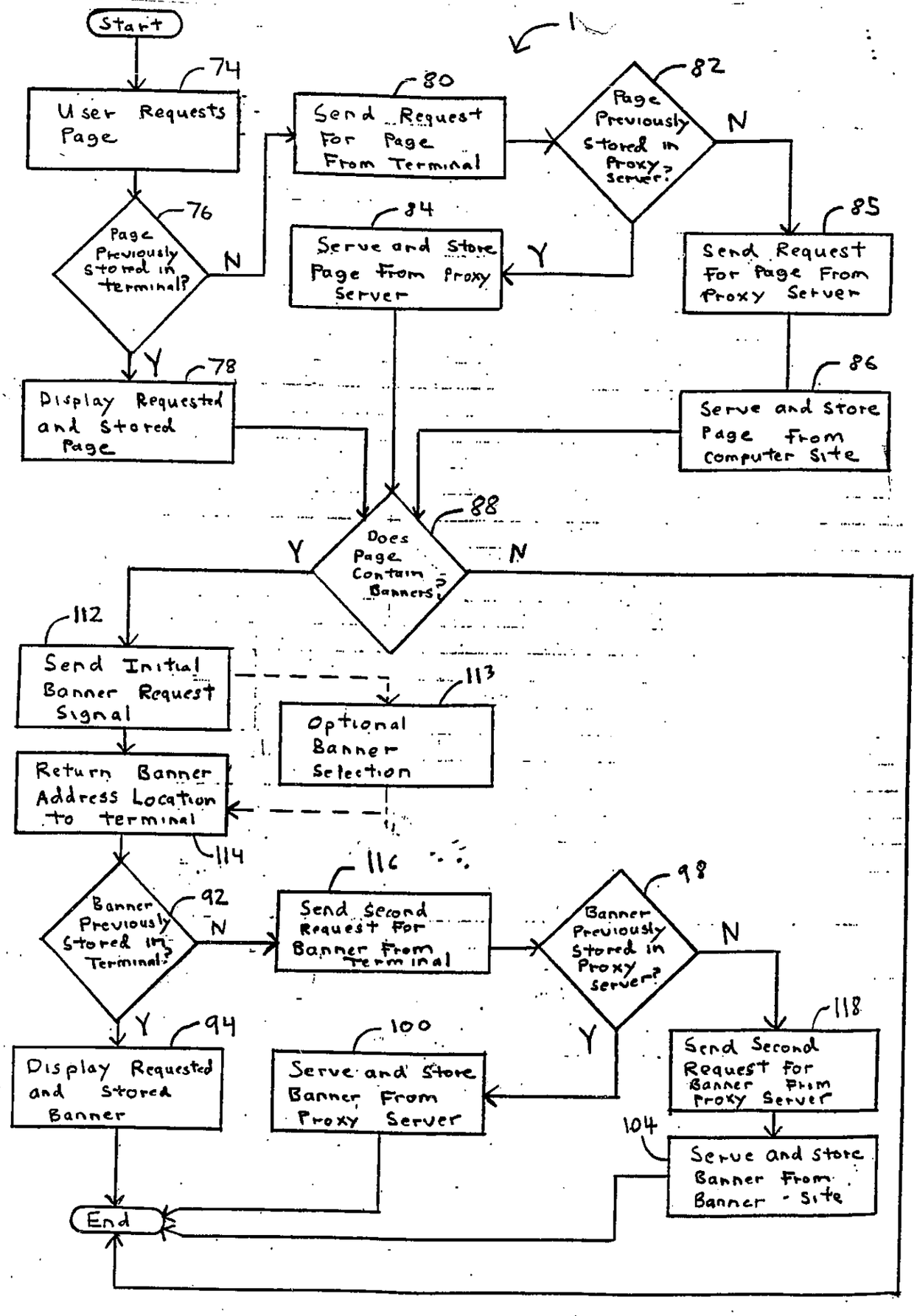

Start
1
74
User Requests Page
80
Send Request For Page From Terminal
82
Page Previously Stored in Proxy Server?
N
76
Page Previously Stored in terminal?
N
84
Serve and Store Page From Proxy Server
Y
85
Send Request For Page From Proxy Server
Y
78
Display Requested and Stored Page
86
Serve and Store Page From Computer Site
88
Does Page Contain Banners?
Y
N
112
Send Initial Banner Request Signal
113
Optional Banner Selection
Return Banner Address Location to terminal
114
116
Banner Previously Stored in Terminal?
92
N
Send Second Request For Banner From Terminal
98
Banner Previously Stored in Proxy Server?
N
Y
94
Display Requested and Stored Banner
100
Serve and Store Banner From Proxy Server
118
Send Second Request for Banner From Proxy Server
104
Serve and Store Banner From Banner - Site
End

FIGURE 4

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

APPLICATION NUMBER	FILING/RECEIPT DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO./TITLE
08/858,650	05/19/97	GRIFFITHS M	18022-001

#2

0292/1007

SCOTT B ALLISON
CHRISMAN BYNUM AND JOHNSON
1900 FIFTEENTH STREET
BOULDER CO 80302

NOT ASSIGNED

2317

DATE MAILED: 10/07/97

NOTICE TO FILE MISSING PARTS OF APPLICATION
Filing Date Granted

An Application Number and Filing Date have been assigned to this application. However, the items indicated below are missing. The required items and fees identified below must be timely submitted ALONG WITH THE PAYMENT OF A SURCHARGE for items 1 and 3-6 only of $ 130 for a ☑ large entity ☐ small entity in compliance with 37 CFR 1.27. The surcharge is set forth in 37 CFR 1.16(e). Applicant is given TWO MONTHS FROM THE DATE OF THIS NOTICE within which to file all required items and pay any fees required above to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

If all required items on this form are filed within the period set above, the total amount owed by applicant as a ☑ large entity ☐ small entity (verified statement filed), is $ 1568.

☑ 1. The statutory basic filing fee is:
- ☑ missing.
- ☐ insufficient.

Applicant must submit $ 790 to complete the basic filing fee and/or file a verified small entity statement claiming such status (37 CFR 1.27).

☑ 2. Additional claim fees of $ 648, including any multiple dependent claim fees, are required:
Applicant must either submit the additional claim fees or cancel additional claims for which fees are due.

☑ 3. The oath or declaration:
- ☑ is missing.
- ☐ does not cover the newly submitted items.
- ☐ does not identify the application to which it applies.
- ☐ does not include the city and state or foreign country of applicant's residence.

An oath or declaration in compliance with 37 CFR 1. 63, including residence information and identifying the application by the above Application Number and Filing Date is required.

☐ 4. The signature(s) to the oath or declaration is/are:
- ☐ missing.
- ☐ by a person other than inventor or person qualified under 37 CFR 1.42, 1.43, or 1.47.

A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.

☐ 5. The signature of the following joint inventor(s) is missing from the oath or declaration:

_____

An oath or declaration listing the names of all inventors and signed by the omitted inventor(s), identifying this application by the above Application Number and Filing Date, is required.

☐ 6. A $_____ processing fee is required since your check was returned without payment (37 CFR 1.21(m)).

☐ 7. Your filing receipt was mailed in error because your check was returned without payment.

☐ 8. The application does not comply with the Sequence Rules.
See attached "Notice to Comply with Sequence Rules 37 CFR 1.821-1.825."

☐ 9. OTHER:

Direct the response and any questions about this notice to "Attention: Box Missing Parts."

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

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

FORM PTO-1533 (REV.7-98) **PART 3 - OFFICE COPY** *U.S. GPO: 1998-404-406/40515

Sectors

#3

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Michael John Griffiths and James David McElhiney	)
Serial No.:	08/858,650	) Art Unit: 2317
Filing Date:	May 19, 1997	)
Title:	INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMATION BEING DELIVERED	) Examiner: Not Yet Accorded
Our File No.:	18022-001	)

CERTIFICATE OF MAILING UNDER 37 C.F.R. 1.8

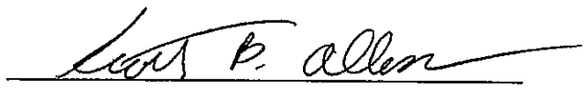
I hereby certify that the following documents:

1. Check No. 10176 in the amount of $824.00 ($719.00 filing fee, $65.00 surcharge fee, and $40.00 assignment recordation fee);
2. Copy of Form PTO-1533 NOTICE TO FILE MISSING PARTS OF APPLICATION FILING DATE GRANTED;
3. Form PTO-1082;
4. DECLARATION FOR PATENT APPLICATION with Power of Attorney executed by the inventors, Michael John Griffiths and James David McElhiney;
5. VERIFIED STATEMENT CLAIMING SMALL ENTITY STATUS (37 CFR 1.9(f) & 1.27(b))--INDEPENDENT INVENTOR signed by the inventors;
6. VERIFIED STATEMENT CLAIMING SMALL ENTITY STATUS (37 CFR 1.9(f) & 1.27(c)--SMALL BUSINESS CONCERN, signed by Peter Estler, President of MatchLogic, Inc.;

12/17/1997 SBLIZZAR 00000019 08858650
04 FC:581 40.00
05 FC:205 65.00

7. Assignment signed by the inventors, with PTO 1595, Recordation Cover Sheet attached; and

return postcard are being deposited with the United States Postal Service as first-class mail, postage prepaid, in an envelope addressed to: Assistant Commissioner for Patents, BOX MISSING PARTS, Washington, D.C. 20231, on this 17th day of November, 1997.



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

APPLICATION NUMBER	FILING/RECEIPT DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO./TITLE
08/858,650	05/19/97	GRIFFITHS	M 18022-001

0292/1007

SCOTT B ALLISON
CHRISMAN BYNUM AND JOHNSON
1900 FIFTEENTH STREET
BOULDER CO 80302

NOT ASSIGNED

SCM DATE MAILED: 2317 10/07/97

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Filing Date Granted

An Application Number and Filing Date have been assigned to this application. However, the items indicated below are missing. The required items and fees identified below must be timely submitted ALONG WITH THE PAYMENT OF A SURCHARGE for items 1 and 3-6 only of $ 130 for a ☑ large entity ☐ small entity in compliance with 37 CFR 1.27. The surcharge is set forth in 37 CFR 1.16(e). Applicant is given TWO MONTHS FROM THE DATE OF THIS NOTICE within which to file all required items and pay any fees required above to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

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☑ 1. The statutory basic filing fee is:
- ☑ missing.
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☑ 2. Additional claim fees of $ 648, including any multiple dependent claim fees, are required.
Applicant must either submit the additional claim fees or cancel additional claims for which fees are due.

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- ☐ does not cover the newly submitted items.
- ☐ does not identify the application to which it applies.
- ☐ does not include the city and state or foreign country of applicant's residence.

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☐ 4. The signature(s) to the oath or declaration is/are:
- ☐ missing.
- ☐ by a person other than inventor or person qualified under 37 CFR 1.42, 1.43, or 1.47.

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_____

An oath or declaration listing the names of all inventors and signed by the omitted inventor(s), identifying this application by the above Application Number and Filing Date, is required.

☐ 6. A $_____ processing fee is required since your check was returned without payment (37 CFR 1.21(m)).

☐ 7. Your filing receipt was mailed in error because your check was returned without payment.

☐ 8. The application does not comply with the Sequence Rules.
See attached "Notice to Comply with Sequence Rules 37 CFR 1.821-1.825."

☐ 9. OTHER:

02/03/1998 TTUTT1 00000004 DA#:031725 08858650
01 FC:202 $130.00 CR

Direct the response and any questions about this notice to "Attention: Box Missing Parts."

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

M. Scott

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

12/17/1997 SBLIZZAR 00000010 08858650
01 FC:201 790.00 DP
02 FC:203 648.00 DP
03 FC:102 130.00 DP

Replin. Ref: 02/03/1998 TTUTT1 00000004 08858650
DA#:031725 $82.00 CR
FC: 704

Assistant dates: 02/03/1998 TTUTT1 00000010 08858650
12/17/1997 SBLIZZAR 82.00 DP
03 FC:102

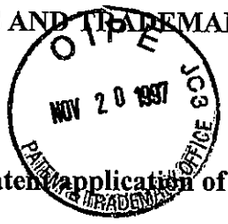
FORM PTO-1533 (REV.7-96) PART 2 - COPY TO BE RETURNED WITH RESPONSE *GPO: 1998-404-496/40515*

FORM PTO-1082

CASE DOCKET NO. 18022-001

THE COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

DATE: November 17, 1997



Sir:

Transmitted herewith for filing is the patent application of

Inventors: Michael John Griffiths and James David McElhiney

For: INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMATION BEING DELIVERED

Enclosed are:

X Declaration for Patent Application
X An Assignment of the invention to MatchLogic, Inc.
X Verified Statements to Establish Small Entity Status Under 37 CFR 1.9 and 37 CFR 1.27.

The filing fee has been calculated as shown below:

	(Col. 1)	(Col. 2)	SMALL ENTITY		OR	Other than a SMALL ENTITY	
FOR:	NO. FILED	NO. EXTRA	RATE	FEE		RATE	FEE
BASIC FEE	XXXXXXX	XXXXXXXX	XXXX	$ 395		XXXX	$ 790
TOTAL CLAIMS	42 - 20 =	22	X $ 11	$ 242		X $22	$____
INDEP CLAIMS	5 - 3 =	2	X $ 41	$ 82		X $82	$____
___ MULTIPLE DEPENDENT CLAIM PRESENTED			X $135	$___		X $270	$____
			TOTAL	$ 719	OR	TOTAL	$____

X A check in the amount of $824.00 to cover the filing fee ($719.00), surcharge ($65.00), and assignment recordal fee ($40.00) is enclosed.

X The Commissioner is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account No. 03-1725 . A duplicate copy of this sheet is enclosed.
- X Any additional filing fees required under 37 CFR 1.16.
- X Any patent application processing fees under 37 CFR 1.17.

X The Commissioner is hereby authorized to charge payment of the following fees during the pendency of this application or credit any overpayment to Deposit Account No. 03-1725 . A duplicate copy of this sheet is enclosed.
- X Any patent application processing fees under 37 CFR 1.17.
- X The issue fee set in 37 CFR 1.18 at or before mailing of the Notice of Allowance, pursuant to 37 CFR 1.311(b).
- X Any filing fees under 37 CFR 1.16 for presentation of extra claims.

Respectfully submitted,

Scott B. Allison

Scott B. Allison, Reg. No. 38,370
CHRISMAN, BYNUM & JOHNSON, P.C.
1900 Fifteenth Street
Boulder, CO 80302
(303) 546-1300

PTO/SB/10 (11-90)

VERIFIED STATEMENT CLAIMING SMALL ENTITY STATUS (37 CFR 1.9(f) & 1.27(c)--SMALL BUSINESS CONCERN	Docket Number (optional) 18022-001

Applicants or Patentees: MICHAEL JOHN GRIFFITHS AND JAMES DAVID McELHINEY
Serial or Patent No.: 08/858,650
Filed or Issued: May 19, 1997
Title: INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTRO THE INFORMATION BEING DELIVERED

I hereby declare that I am

[ ] the owner of the small business concern identified below:
[X] an official of the small business concern empowered to act on behalf of the concern identified below:

NAME OF SMALL BUSINESS CONCERN: MATCHLOGIC, INC.
ADDRESS OF SMALL BUSINESS CONCERN: 400 S. McCaslin Boulevard
Louisville, Colorado 80027

I hereby declare that the above identified small business concern qualifies as a small business concern as defined in 13 CFR 121.12, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees to the United States Patent and Office, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention described in:

[ ] the specification filed herewith with title as listed above.
[X] the application identified above.
[ ] the patent identified above.

If the rights held by the above identified small business concern are not exclusive, each individual, concern or organization having rights in the invention must file separate verified statements averring to their status as small entities, and no rights to the invention are held by any person, other than the inventor, who would qualify as an independent inventor under 37 CFR 1.9(c) if that person made the invention, or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d), or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern or organization having any rights in the invention is listed below:
[X] no such person, concern, or organization exists.
[ ] each person, concern or organization is listed below.

Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

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

NAME OF PERSON SIGNING Peter Estler
TITLE OF PERSON IF OTHER THAN OWNER President
ADDRESS OF PERSON SIGNING MATCHLOGIC, INC.
400 S. McCaslin Boulevard
Louisville, Colorado 80027

SIGNATUREX _____ DATE X 9/19/97

18022-00

PTO/SB/01 (11-90)

DECLARATION FOR PATENT APPLICATION

DOCKET NUMBER (Optional)
18022-001

As below named inventor, I hereby declare that:

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

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventors (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled **INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMATION BEING DELIVERED**, the specification of which is attached hereto unless the following box is checked:

[X] was filed on May 19, 1997 as United States Application Number or PCT International Application Number 08/858,650 and was amended on _____ (if applicable).

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

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

Prior Foreign Applications(s)	Priority Claimed	Priority Claimed	
(Number)	(Country)	(Day/Month/Year Filed)	[ ] Yes [ ] No

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

(Application Number)	(Filing Date)	(Status - patented, pending, abandoned)

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:
JAMES R. YOUNG, Reg. No. 27,847, STEVEN C. PETERSEN, Reg. No. 36,238, ROBERT G. CROUCH, Reg. No. 34,806, SCOTT B. ALLISON Reg. No. 38,370, BARBARA A. GYURE, Reg. No. 34,614
Address all telephone calls to Scott B. Allison at telephone number (303) 546-1300
Address all correspondence to **Scott B. Allison, Chrisman, Bynum & Johnson, 1900 Fifteenth Street, Boulder, Colorado 80302**

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

Full name of sole or first inventor (given name, family name) Michael John Griffiths

Inventor's signature X _____ Date 9/23/97

Residence 11334 North Eaton Way, Broomfield, Colorado, 80020 Citizenship Canada

Post Office Address 11334 North Eaton Way, Broomfield, Colorado 80020

PTO/SB/01 (11-90)

DECLARATION FOR PATENT APPLICATION

DOCKET NUMBER (Optional)
18022-001

As a named inventor, I hereby declare that:

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

Full name of second inventor (given name, family name) James David McElhiney

Inventor's signature X _____ Date Sept 23/97

Residence 114 4th Avenue, Ottawa, Ontario, Canada K1S 2L4 Citizenship Canada.

Post Office Address 114 4th Avenue, Ottawa, Ontario, Canada K1S 2L4

Full name of third inventor (given name, family name) _____

Inventor's signature X _____ Date _____

Residence _____ Citizenship _____

Post Office Address _____

PTO/SB/09 (11-90)

VERIFIED STATEMENT CLAIMING SMALL ENTITY STATUS (37 CFR 1.9(f) & 1.27(b))--INDEPENDENT INVENTOR	Docket Number (optional) 18022-001

Applicant or Patentee: MICHAEL JOHN GRIFFITHS AND JAMES DAVID MCELHINEY

Serial or Patent No.: 08/858,650

Filed or Issued: MAY 19, 1997

Title: INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMATION BEING DELIVERED

As a below named inventors, we hereby declare that we qualify as an independent inventors as defined in 37 CFR 1.9(c) for the purposes of paying reduced fees to the Patent and Trademark Office described in:

[ ] the specification filed herewith title as listed above.

[X] the application identified above.

[ ] the patent identified above.

We have not assigned, granted, conveyed or licensed and am under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who would not qualify as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

[ ] No such person, concern, or organization exists.

[X] Each such person, concern or organization is listed below.

MatchLogic, Inc.

Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

We acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

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

MICHAEL JOHN GRIFFITHS
NAME OF INVENTOR

Signature of Inventor

9/23/97
Date

JAMES DAVID McELHINEY
NAME OF INVENTOR

Signature of Inventor

Sept 23/97
Date

0200

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Michael John Griffiths and James David McElhiney	)	
Serial No.:	08/858,650	)	Group Art Unit: Not Yet Accorded
Filing Date:	May 19, 1997	)	Examiner: Not Yet Accorded
Title:	INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMAITON BEING DELIVERED	)	
Our File No.:	18022-001	)	

INFORMATION DISCLOSURE STATEMENT

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

Dear Sir:

The applicants hereby submit their Information Disclosure Statement pursuant to 37 C.F.R. §§ 1.56, 1.97 and 1.98 and respectfully request the Examiner to consider the information disclosed in the patents and publications listed below:

CITATIONS

U.S. Patents	Inventors	Issue Dates
5,247,670	Matsunaga	September 21, 1993
5,289,371	Abel et al.	February 22, 1994
5,347,632	Filepp et al.	September 13, 1994
5,430,729	Rahnema	July 4, 1995
5,442,771	Filepp et al.	August 15, 1995
5,459,837	Caccavale	October 17, 1995
5,557,721	Fite et al.	September 17, 1996

5,572,643	Judson	November 5, 1996
5,583,991	Chatwani et al.	December 10, 1996
5,598,532	Liron	January 28, 1997
5,602,991	Berteau	February 11, 1997
5,617,540	Civanlar et al.	April 1, 1997
5,621,884	Beshears et al.	April 15, 1997
5,628,009	Kikuta et al.	May 6, 1997

ARTICLES AND PUBLICATIONS

"Reload, Redraw, Repeat", Paul Boutin, downloaded from electronic webcite address as of May 16, 1997 of: *httw://www.packet.com/packet/boutin/97/17/geek, html#l*, pp. 1-4.

"Advertisers, Privacy Advocates Clash Over Giving Users More 'Cookie' Control," Angela Drolte, *Electronic Information Policy & Law Report*, 2(21):530-531 (1997).

One (1) page of Form PTO-1449 and copies of all the above-cited prior art are enclosed for the Examiners convenience.

Dated this 19th day of September, 1997.

Respectfully submitted,

Scott B. Allison, Reg. No. 38,370
CHRISMAN, BYNUM & JOHNSON, P.C.
1900 Fifteenth Street
Boulder, Colorado 80302
Telephone: (303) 546-1300

CERTIFICATE OF MAILING UNDER 37 C.F.R. §1.8

I hereby certify that the foregoing INFORMATION DISCLOSURE STATEMENT along with PTO-Form 1449 and copies of all recited prior art, was mailed by first-class U.S. mail, postage prepaid to the Assistant Commissioner for Patents, Washington, DC 20231 on this 19th day of September, 1997.

CKennedy

Sheet 1 of 1

FORM PTO-1449 (Rev. 7-80)	U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTY. DOCKET NO. 18022-001	SERIAL NO. 08/858,650
LIST OF PRIOR ART CITED BY APPLICANT (Use several sheets if necessary)		APPLICANTS: Griffiths, et al.	
		FILING DATE May 19, 1997	GROUP Not Yet Accorded 2757 2153

U.S. PATENT DOCUMENTS

*EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	AA	5,247,670	September 21, 1993	Matsunaga	395	650	
	AB	5,289,371	February 22, 1994	Abel, et al.	364	401	
	AC	5,347,632	September 13, 1994	Filepp, et al.	395	200	
	AD	5,430,729	July 4, 1995	Rahnema	270	94.1	
	AE	5,442,771	August 15, 1995	Filepp, et al.	395	650	
	AF	5,459,837	October 17, 1995	Caccavale	395	184.01	
	AG	5,557,721	September 17, 1996	Fite, et al.	395	148	
	AH	5,572,643	November 5, 1996	Judson	395	793	
	AI	5,583,991	December 10, 1996	Chatwani, et al.	395	200.01	
	AJ	5,598,532	January 28, 1997	Liron	395	200.01	
	AK	5,602,991	February 11, 1997	Berteau	395	200.01	
	AL	5,617,540	April 1, 1997	Civanlar, et al.	395	200.11	
	AM	5,621,884	April 15, 1997	Beshears, et al.	395	182.08	
	AN	5,628,009	May 6, 1997	Kikuta, et al.	395	610	

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

	AO	"Reload, Redraw, Repeat", Paul Boutin, downloaded from electronic webcite address as of May 16, 1997 of: *httw://www.packet.com/packet/boutin/97/17/geek,html#1*, pp. 1-4
	AP	"Advertisers, Privacy Advocates Clash Over Giving Users More 'Cookie' Control," Angela Drolte, *Electronic Information Policy & Law Report*, 2(21):530-531 (1997).

EXAMINER D. O'Dell 2/11/99

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

PACKET

Paul Boutin TECH

Reload, Redraw, Repeat

Redundant ad banners are a waste of time and bandwidth, but the solution requires an unlikely truce between the browser companies

Like it or not, advertising banners on the Web aren't going away any time soon. Even if you welcome them, they take up a maddening amount of bandwidth and time by constantly reloading, a characteristic that becomes especially annoying over a home-dialup connection. Fortunately, there's hope: our favorite browser makers could make ad delivery less painful for everyone. But whether or not they will remains to be seen.

The total time you spend downloading ads is a function of how many ads you download, and how large each one is. Size is enough of a problem, with banners running from 8 KB to 15 KB apiece, but the real criminal is that chunk of code from the ad site's server that reloads every time the banner is redrawn.

Consuming push content needs to be as easy as watching TV before it will really catch on.

So why are ad banners reloaded every time you encounter a page you've already seen, when your browser already has a copy cached on your local hard disk? Because advertisers insist on paying per impression - they are billed each time the banner is shown to a user. In order to invoice an advertiser, managers of the host site need to log the number of times an ad is served. With the current technology, individual browsers can't report how many times they have rendered a specific ad banner. So we have to log the number of times the host's server has delivered a given ad.

Normally, the browser would simply fetch an ad it has already displayed from the local hard disk. But to force it to reload each time, you have to convince the browser that it's never seen the ad before. Click Geek This to see how:

These reloads can be personally frustrating and they bog down the Web in general. The advertisers don't like them either; the long delays caused by ad reloads don't help to build a positive brand image.

Microsoft and Netscape are in a unique position to remove the pox of perpetually reloading ads from the Web once and for all, simply by adding a reporting feature to their browsers. Instead of forcing the browser to revisit a server, the improved browser would count the number of times it displays a cached banner, and then report that information back to the ad server or a designated reporting site. These reports would each be far smaller than even one extra ad-banner reload and would free up substantial bandwidth. Web-site server loads would go down, and as

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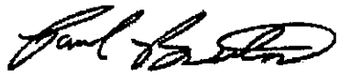
load times decrease, readership may well increase.

Both Microsoft and Netscape have some sort of reporting features planned for their 4.0 browsers. Microsoft's Channel Definition Format (CDF) standard for push-media content sites includes a Tracking Element - a URL to report user behavior to. Netscape points out that its licensed Castanet channel technology already provides a back channel through which information can be passed from client to server.

But a real solution isn't here yet, because standardized reporting software won't come with the 4.0 browsers. If Microsoft and Netscape can agree on a cross-platform standard, cost-per-impression reports will be easy to sell to advertisers, easy to train webmasters and ad-sales staffs on, and easy to support. But needless to say, getting the browser companies to work together is a tall order.



Talk back to Paul Boutin in his column's Threads.

Previously in Boutin ...

Previously in Garfinkel ...

NetGravity

FOR IMMEDIATE RELEASE
October 14, 1996

NetGravity Announces AdServer 2.0, Raises the Standard in Online Advertising Management Software

Industry-Leading Advertising Management Software Gives Sites Enhanced Targeting Ability, Modular Architecture, Greater Performance and Extensibility

SAN MATEO, Calif., October 14, 1996-NetGravity, the proven leader in online advertising management software, today announced the release of NetGravity AdServer™ 2.0, its industry-leading Internet advertising management software. NetGravity AdServer, used by more than 30 of the top advertising-supported sites on the Web -including Netscape, Time Inc.'s Pathfinder, CondéNet, Individual Inc. and Nations Restaurant News - was the first product developed specifically for Web sites to optimize the effectiveness and profitability of online advertising. NetGravity AdServer 2.0 delivers second generation online ad management, enhancing the performance, extensibility, reliability and targeting abilities of the product. NetGravity has experience in delivering mission-critical software to advertising-supported Web sites and offers 24 hour-a-day, seven-day-a-week support.

"For more than a year NetGravity has defined the market for online advertising management software," said John Danner, president of NetGravity. "We listened to our customers' requests while integrating further innovations into NetGravity AdServer 2.0, making it the only time-tested ad management product on the market. NetGravity realizes that when a revenue generating application is not working, a site is losing money. We deliver an ad management tool that is 100 percent reliable under the most demanding conditions."

Scalable, Distributed, Extensible, High Performance Architecture

The ability to serve ads efficiently and scale operations quickly is a must for any successful ad-supported site. NetGravity AdServer 2.0's scalable, distributed architecture delivers a number of benefits to customers, including intelligent caching and unlimited growth potential. AdServer 2.0 automatically remembers which ads have been scheduled for the most popular pages, greatly optimizing the speed at which ads get served. As a site grows, AdServer easily scales to support the additional traffic. AdServer's distributed architecture ensures the performance of a site will never be slowed down by serving ads. This distributed system also enables sites to run separate modules on different hardware platforms.

AdServer 2.0's extensibility enables sites to customize and extend AdServer functionality to suit their specific needs. For example, using NetGravity's API a Web site may choose to create custom reports to augment existing AdServer 2.0 reports. A Web site can also extend AdServer's targeting abilities by including additional custom targeting criteria.

"With the online advertising market heading towards $5 billion by the year 2000, it's crucial for sites to have access to the tools they need to manage placement and targeting," said Adam Schoenfeld, vice president publishing at Jupiter Communications. "Without powerful ad management tools, sites can't offer true value to their advertisers, and run the risk of turning their most crucial business relationships over to outsiders."

Lead Report

Privacy

Advertisers, Privacy Advocates Clash Over Giving Users More 'Cookie' Control

A request for comment on an Internet Engineering Task Force proposal to give users more control over "cookies"—the technology that tracks a user's clicks through a World Wide Web site—has pitted advertisers against privacy advocates.

The HTTP State Management Mechanism proposal (RFC 2109), dated February 1997, would make it easier to control the use of cookies by changing the default setting for "third party cookies."

Third party cookies are cookies that occur through "unverifiable transactions," according to David M. Kristol, technical staff member at Bell Laboratories, Lucent Technologies, Murray Hill, N.J. Kristol is a co-author of RFC 2109.

The RFC is in the comment phase.

'Cookie,' 'Third Party Cookie.' A cookie is a data package that a World Wide Web server sends to a Web browser. It can contain a variety of information, including a user's virtual identity—i.e., the identifier that a Web site assigns a user to identify the user each time he or she visits the site.

Cookies can also be used to store password and login information so that a user visiting a secured Web site is automatically identified and does not have to resubmit that information on each visit.

Advertisers like cookies because they can be used to tailor ads to customers, based on their likes, dislikes, and shopping habits. Some vendors simply ask a user to fill out a questionnaire to get this information; cookies, however, can create a customer profile by tracking where the user goes on a Web site and what links the user clicks on.

Advertisers can keep track of ads that consumers have seen on various Web sites through third party cookies. A third party cookie enables a third party—i.e., a Web site other than the host site—to obtain data about a user through the unrelated Web site. The process works as follows: A user visits a Web site, which contains a URL reference to the advertiser's Web site. The existence of the URL reference is not apparent to the user, and when the user clicks on a Web page having the reference, user information is transferred to the advertising site unbeknownst to the user.

The first time a user clicks on a Web site containing the advertiser's embedded URL, the advertiser sends the user's browser a cookie, which contains the identifier that the advertiser assigned the user. Thereafter, each time the user clicks on a Web site containing an embedded URL to the advertiser, the user's browser sends the advertiser's server the cookie.

These cookies enable the advertiser to keep track of the ads that it has shown your virtual persona. Based on the collected information, the advertiser can choose a particular ad to display on the host Web site. Without the user supplying additional information, such as his or her name or e-mail address, the advertiser simply knows that a user with a particular assigned virtual persona has seen its ad X number of times on specified Web sites. The more information the advertising Web site has collected about your virtual persona, the better able it is to tailor specific ads to you as you browse the World Wide Web.

Privacy Concerns. Although cookies are not new, their existence has recently garnered increasing publicity, creating a stir among users who worry that their privacy may be compromised through the use of cookies.

Concern has been further heightened by reports of some Web sites sharing information about their visitors with each other. That practice could permit an advertiser or other Web site operator to piece together information the user has submitted for one purpose—say, to sign up for a service—with other information—e.g., that collected through cookies, thereby being able to match an individual's virtual persona with his or her real persona. The end result is a potential boom for advertisers, who, equipped with detailed information about a user, could further tailor ads to particular users.

Although some browsers enable the user to view the cookie files that have been written to the user's hard drive, there is currently no way to intercede the transmission of a third party cookie.

People are troubled by what transpires behind their backs, Kristol said. RFC 2109 would change the specifications for third party cookies to direct the browser not to accept the cookie. The specifications would permit browser manufacturers and vendors to build alerts into their systems, flagging users to third party cookies. Those alerts would be available, however, only if the user rejects the default setting.

In an April 7 letter, a coalition of consumer, civil liberties, and children's advocacy groups expressed their support for the IETF proposal. The letter was signed by the Center for Media Education, the Consumer Project on Technology, the Electronic Privacy Information Center, Computer Professionals for Social Responsibility, the Consumer Federation of America, the Electronic Frontier Foundation, the National Association of Elementary School Principals, NetAction, Privacy International, the U.S. Privacy Council, and more than 100 Internet users.

"The proposal will allow users to exercise greater control over the creation and collection of personal information resulting from transactions between web clients and web servers," the groups said.

"We believe that 'transparency'—the ability of users to see and exercise control over the disclosure of personally identifiable information—is a critical guideline for the development of sensible privacy practices on the Internet," they added.

"There should never be a case where private firms and government agencies are writing and reading information on a consumer's hard disk, without explicit authorization," CPT Director James Love said in a press release. "These transactions must be more transparent, and the users must have the practical ability to say no."

Adverse Impact on E-Commerce? Predictably, advertisers are positioned in the opposite side of the ring. The Association of Online Professionals urged the IETF to retain the current cookie defaults in Web browsers.

The proposal will adversely impact the industry, the association said, including:

- the potential loss of services from online services relying on cookies for passwords, preferences, and other tasks;
- the loss of electronic commerce relying on cookies, including those using the "shopping cart" models;
- the loss of a major method for assessing advertising effectiveness for Web sites relying economically on those revenues and sponsorships;
- the loss of "[h]undreds of thousands of . . . man-hours for reprogramming of web sites"; and
- added technical support costs for Internet service providers, online services, and browser software companies, "who will have to deal with subscribers who do not understand Cookies or their use, when web sites 'don't work.' "

"If there were a valid threat to privacy, or a single documented case of the technology being abused to the detriment of consumers, we might feel differently," AOP Executive Director Dave McClure said in an April 22 press release. We cannot allow "vague fears to dictate the technology, the structure or the growth of the online industry," he added.

"Abandoning a widely used and largely effective technology just because it might possibly be abused is not a rational response to privacy concerns," McClure said. He said the proposal should not be adopted because users can easily control Web browsers and because, to date, there is no record of cookie abuse.

Cookies Abound. In a discussion with BNA, McClure explained that users can see what cookies have been set on a browser file. Cookies simply record the name of the Web site and the identification number assigned to the user. In fact, they are so widely used, that if you used a browser option designed to alert you every time a cookie file is written to your hard drive, alarms would be sounding incessantly as you browse the World Wide Web, McClure said.

It is true that some Web sites have decided to share databases of information they have collected on Web site visitors, McClure said. While this is a reason to not visit those sites, it is not a reason to change the cookie settings. Although not in favor of it, McClure said a possible solution would be to make it unlawful to share information without the user's authorization.

McClure also pointed out the potential effect on service fees that a requirement to obtain authorization before sharing information would have. He noted that junk mail subsidizes the U.S. postal system. What if Internet access were to cost $200 per month? McClure queried. Would one be willing to trade low-cost access for greater privacy protections? he asked.

A simple rule, he said, is that if one does not want personal information traded, one should not give out that information in the first place—in the real world, or online.

Privacy is a social and regulatory issue—not a technology issue, McClure said. You do not solve social issues with technology; rather, you solve them with sound and reasonable policies, he told BNA.

Long Process. The eventual outcome of the IETF proposal may not be known for some time. The RFC process for IETF proposals tends to be fairly long. Although IETF standards are voluntary, they have, in the past, been followed as law.

According to Peter Harter, public policy counsel for Netscape Communications Corp., Netscape is backing the RFC as originally drafted. Indeed, the proposal's other co-author is Lou Montulli, a Netscape founding engineer.

The IETF proposal would permit common standards for how cookies are set—e.g., what it looks like and how it is set. As such, it is a management protocol, Harter noted.

Through a browser, cookies can be sent to certain files so that a user knows what cookies have been set. Netscape 3.0 allows a user to program an alarm to sound when a cookie is activated. Montulli wanted an open standard for this mechanism, Harter said.

Open standards for cookies, including how they are created, would not only give users better control over the collection of personal information online, but would help Web site operators because the resulting products would be interoperable, Harter said. Interoperability, coupled with user control, will make cookies a more effective tool for online commerce, he said.

'eTRUST' Would Be an Add-On. The online world is addressing privacy concerns as well. One program, "eTRUST," aims to rate Internet sites according to defined privacy standards that govern how personal information is collected and used (1 EPLR 621). The program is a collaborative effort among the Electronic Frontier Foundation, CyberSource Corp., Portland Software, TestDrive Corp., and InfoOnline.

According to Kristol, the eTRUST ratings system would not substitute for RFC 2109, but would constitute an add-on function.

As a proposed standard, the RFC must be out for comment for the earlier of six months or the appearance of two independent, interoperable implementations of the specification.

If changes are made to the proposal, it will then become a draft standard. After a minimum of two months, it would then be eligible to become a standard. That stage of the process tends to move relatively quickly, Kristol said.

Kristol noted that he has issued a second draft of the proposal, containing technical changes but not changing the substance of the proposed third party cookie specification. While IETF received a flurry of comments in February and March on the original proposal, Kristol's second draft has not received any, he said.

BY ANGELA DROLTE

The text of RFC 2109, along with other documents in the Request for Comments series, is available at InterNIC's World Wide Web site, http://rs.internic.net/nic-support/.

Gp. ~~2317~~ 2782

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Michael John Griffiths and James David McElhiney	)
Serial No.:	08/858,650	) Art Unit: 2317
Filing Date:	May 19, 1997	)
		) Examiner: Not Yet Accorded
Title:	INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMATION BEING DELIVERED	)
Our File No.:	18022-001	)

CERTIFICATE OF MAILING UNDER 37 C.F.R. §1.8

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

I hereby certify that the following documents:

1. Intervention by Assignee, Revocation of Power of Attorney and Appointment of New Power of Attorney and Address for Correspondence;

2. Certificate Under 37 CFR §3.73(b); and

Return Post Card are being deposited with the United States Postal Service as first-class mail, postage prepaid, in an envelope addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231, on this 13th day of April, 1998.

Kennedy

#6 aug 4/22

CERTIFICATE OF MAILING UNDER 37 C.F.R. 1.8

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to Assistant Commissioner for Patents, Washington, DC 20231 on April 13, 1998.

Kennedy

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Michael John Griffiths and James David McElhiney	)	
Serial No.:	08/858,650	)	Art Unit: 2756 ~~2317~~
Filing Date:	May 19, 1997	)	
		)	Examiner: Not Yet Accorded
Title:	INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMATION BEING DELIVERED	)	
Our File No.:	18022-001	)	

**INTERVENTION BY ASSIGNEE,
REVOCATION OF POWER OF ATTORNEY
AND
APPOINTMENT OF NEW POWER OF ATTORNEY
AND ADDRESS FOR CORRESPONDENCE**

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

Sir:

Intervention and Revocation

MATCHLOGIC, INC., a corporation organized and existing under the laws of the State of Colorado, the assignee of record of the entire right, title, and interest in and to the invention and the above-referenced patent application, **hereby intervenes** in this patent application and **revokes all powers of attorney** previously appointed by the inventors or by any other entity in

this patent application.

Appointment of Power of Attorney

MATCHLOGIC, INC., hereby appoints, effective immediately, as principal attorneys and/or patent agents: James R. Young, Reg. No. 27,847; Steven C. Petersen, Reg. No. 36,238; Robert G. Crouch, Reg. No. 34,806; Scott B. Allison, Reg. No. 38,370, and Barbara A. Gyure, Reg. No. 34,614.

Address for Correspondence

Please direct all communications to the following address:

Scott B. Allison
CHRISMAN, BYNUM & JOHNSON, P.C.
1900 Fifteenth Street
Boulder, Colorado 80302
Telephone: (303) 546-1300
Fax: (303) 449-5426

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

MATCHLOGIC, INC.

John Moinester

Date: 4/13/98

CERTIFICATE UNDER 37 CFR 3.73(b)

Applicant: MICHAEL JOHN GRIFFITHS AND JAMES DAVID MCELHINEY

Application No.: 08/858,650 Filed: May 19, 1997

Entitled: INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMATION BEING DELIVERED

MATCHLOGIC, INC., a COLORADO CORPORATION
(Name of Assignee) (Type of Assignee, e.g. corporation, partnership, university, government agency, etc.)

certifies that it is the assignee of the entire right, title and interest in the patent application identified above by virtue of either:

A. [ ] An assignment from the inventor(s) of the patent application identified above. The assignment was recorded in the Patent and Trademark Office at Reel _____, Frame _____, or for which a copy is attached.

OR

B. [ ] A chain of title from the inventor(s) of the patent application identified above, to the current assignee as shown below:

1. From:_____ To:_____
The document was recorded in the Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

2. From:_____ To:_____
The document was recorded in the Patent and Trademark Office at Reel _____, Frame , or for which a copy thereof is attached.

3. From:_____ To:_____
The document was recorded in the Patent and Trademark Office at Reel _____, Frame _____, or for which a copy there is attached.

[ ] Additional documents in the chain of title are listed on a supplemental sheet.

[X] Copies of assignment or other documents in the chain of title are attached.

The undersigned has reviewed all the documents in the chain of title of the patent application identified above and, to the best of undersigned's knowledge and belief, title is in the assignee identified above.

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

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

4/13/98
Date

Signature

JOHN MOINESTER
Typed or printed name

CHIEF FINANCIAL OFFICER Title

ASSIGNMENT

WHEREAS, we, Michael John Griffiths, 11334 North Eaton Way, Broomfield, Colorado 80020, and James David McElhiney, 114 4th Avenue, Ottawa, Ontario, Canada K1S 2L4, have invented a certain new and useful INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMATION BEING DELIVERED, for which application for Letters Patent of the United States was filed on May 19, 1997, and assigned Serial No. 08/858,650.

WHEREAS, MatchLogic, Inc., 400 S. McCaslin Boulevard, Louisville, Colorado 80027, a Delaware Corporation fully organized and existing under the laws of the State of Delaware is desirous of acquiring the entire right, title and interest therein and thereto;

NOW, THEREFORE, be it known that for and in consideration of the sum of One Dollar ($1.00) and certain other good and valuable consideration to us in hand paid, the receipt of which is hereby acknowledged, we, the said Inventors, Michael John Griffiths and James David McElhiney, by these presents do sell, assign and transfer unto the said MatchLogic, Inc., its successors, legal representatives and assigns, our entire right, title and interest in and to the said invention and the aforesaid patent application, for the territory of the United States of America and for all foreign countries and to all Letters Patent, continuations and reissues, and extensions to be obtained therefore; and we further agree to cooperate with the assignee hereunder in the obtaining and sustaining of any and all such

Letters patent, but at the expense of said assignee.

We further hereby assign and agree to assign to MatchLogic, Inc., the entire right, title and interest, domestic and foreign which we may have in discoveries, improvements and inventions made, conceived or developed by us in connection with the development of said INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMATION BEING DELIVERED, and do further agree to execute all applications for patent, assignments and other appropriate documents and to perform all acts and to do all things necessary to make this Agreement effective and to perfect all right, title and interest in and to said discoveries, improvements or inventions in MatchLogic, Inc. The Commissioner of Patents is hereby authorized and requested to issue the letters Patent solely in accordance with the terms of this Assignment to MatchLogic, Inc.,its successors, legal representatives and assigns, as the assignee of the entire right, title and interest therein.

IN WITNESS WHEREOF, we have hereunto set our hands and affixed our seals on the date set forth hereinafter.

Witness
J. BARNABY.

Michael J. Griffiths

James D. McElhiney

STATE OF COLORADO)
) ss.
COUNTY OF Boulder)

Before me, a Notary Public in and for the said County and State, personally appeared Michael John Griffiths, known to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same for the purposes and consideration therein expressed.

Given under my hand and seal of office this 25TH day of September, 1997.

My commission expires: 11/12/2000.

(SEAL)

Notary Public

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

SERIAL NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
08/858,650	05/19/97	MICHAEL JOHN GRIFFTHS, et al.	18022-001

EXAMINER	
F. Asta	
ART UNIT	**PAPER NUMBER**
2756	6

DATE MAILED: 4/24/98

This is in response to the Power of Attorney filed April 17, 1998.

☒ 1. The Power of Attorney to you in this application **has been revoked** by the applicant. Future correspondence will be mailed to the new address of record. 37 CFR 1.33.

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

☐ 3. The withdrawal as attorney in this application **has been accepted**. Future correspondence will be mailed to the new address of record. 37 CFR 1.33.

April Cheeves
This is a communication from the
Patent and Trademark Office

☒ 4. The Power of Attorney in this application **is accepted**. Correspondence in this application will be mailed to the below-noted address as provided by 37 CFR 1.33.

☐ 5. The Power of Attorney in this application **is not accepted** for the reason(s) checked below:

☐ a. The Power of Attorney is from an assignee and the Certificate required by 37 CFR 3.73 (b) has not been received.

☐ b. The person signing for the assignee has omitted their empowerment to sign on behalf of the assignee.

☐ c. The inventor(s) is without authority to appoint attorneys since the assignee has intervened as provided by 37 CFR 3.71.

☐ d. The signature of _____, a co-inventor in this application, has been omitted. The Power of Attorney will be entered upon receipt of confirmation signed by said co-inventor.

☐ e. The person(s) appointed in the Power of Attorney is not registered to practice before the U. S. Patent & Trademark Office.

☐ f. The revocation is not signed by the applicant, the assignee of the entire interest, or **one** particular principal attorney having the authority to revoke.

SCOTT B. ALLISON
CHRISMAN, BYNUM AND JOHNSON
1900 FIFTEENTH ST.
BOULDER, CO 80302

April Cheeves
This is a communication from the
Patent and Trademark Office
Group 2700

FORM PTOL-305 (REV. 7/89) RETAIN THIS COPY IN THE APPLICATION FILE COPY A

UNITED STATES DEPARTMENT OF COMMERCE
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Washington, D.C. 20231

SERIAL NUMBER	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/858,650	05/19/97	GRIFFITHS M	18022-001

LMC1/0304

SCOTT B ALLISON
CHRISMAN BYNUM AND JOHNSON
1900 FIFTEENTH STREET
BOULDER CO 80302

EXAMINER	
DINH, D	
ART UNIT	**PAPER NUMBER**
2757	7

DATE MAILED: 03/04/99

This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

☒ This application has been examined ☐ Responsive to communication filed on _____ ☐ This action is made final.

A shortened statutory period for response to this action is set to expire 3 month(s), 0 days from the date of this letter. Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. ☒ Notice of References Cited by Examiner, PTO-892.
2. ☐ Notice of Draftsman's Patent Drawing Review, PTO-948.
3. ☒ Notice of Art Cited by Applicant, PTO-1449.
4. ☐ Notice of Informal Patent Application, PTO-152.
5. ☐ Information on How to Effect Drawing Changes, PTO-1474.
6. ☐ _____.

Part II SUMMARY OF ACTION

1. ☒ Claims 1-42 are pending in the application.
   Of the above, claims _____ are withdrawn from consideration.
2. ☐ Claims _____ have been cancelled.
3. ☐ Claims _____ are allowed.
4. ☒ Claims 1-42 are rejected.
5. ☐ Claims _____ are objected to.
6. ☐ Claims _____ are subject to restriction or election requirement.
7. ☒ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.
8. ☐ Formal drawings are required in response to this Office action.
9. ☐ The corrected or substitute drawings have been received on _____. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable; ☐ not acceptable (see explanation or Notice of Draftsman's Patent Drawing Review, PTO-948).
10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on _____, has (have) been ☐ approved by the examiner; ☐ disapproved by the examiner (see explanation).
11. ☐ The proposed drawing correction, filed _____, has been ☐ approved; ☐ disapproved (see explanation).
12. ☐ Acknowledgement is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☐ been received ☐ not been received ☐ been filed in parent application, serial no. _____; filed on _____.
13. ☐ Since this application apppears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.
14. ☐ Other

EXAMINER'S ACTION

PTOL-326 (Rev. 2/93)

DETAILED ACTION

Claim 8 is dependent upon itself. It is assumed to be dependent upon claim 7 for the rejection below.

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

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kohda et al. "Ubiquitous advertising on the WWW: Merging advertisement on the browser" and further in view of Pitkin et al. US patent 5,341,477.

As per claim 1, Kohda teaches a method of information storage and delivery essentially as claimed, comprising the steps of:

serving a first portion of information [web page] to the terminal where in the first portion contains reference to a second portion [advertisement];

sending a request from the terminal to the primary server [Advertising agent] requesting the second portion.

returning the second portion to the terminal [p.1495 col.1].

Kohda does not specifically disclose the terminal requesting the location of the second portion and retrieving the second portion based on the address return from the request. Kohda teaches the second portion is delivered via the Advertising Agent(i.e. primary server).

Pitkin teaches a system for improving load balancing and service efficiency in network system by having a primary server (Broker) determines a secondary server that best serve the requesting terminal and the terminal contact the selected secondary server for services base on information returned from the Broker [see abstract, col.3 lines 45-47].

Hence, one of ordinary skill in the art would have been motivated to combine Pitkin teaching with Kohda to return the address of the second portion to the terminal and let the terminal retrieves the second portion because it would have improved the efficiently of the system and reduced processing load on the Advertising Agent.

As per claim 2, Kohda teaches the first request to the primary server [Advertising Agent] is not block by intermediary device or cache [apparent from p.1495 section 2.2 and 2.3].

As per claims 3 and 6, Kohda teaches the second portion being served by the primary [Advertising Agent] or secondary [Advertiser Server] (see p.1494 col.2 1st paragraph).

As per claims 4-5, Pitkin disclose the first request is a general content request [col.2 lines 6-10]. It is apparent in the system as modified that the first request is a generic request for an advertisement from the Advertising Agent and the second request is a specific request to retrieve the selected advertisement stored in an Advertiser Server.

As per claim 7, Pitkin teaches the primary server determines the best suited server [Abstract].

As per claim 8, it is apparent in the system as modified that the result of the determination is send to the terminal in order to enable the terminal to retrieve the selected advertisement.

As per claim 9, Pitkin discloses data structure for selecting a server to a terminal [col.6]. Pitkin does not specifically disclose creating a matrix. The specific data structure for associating terminals and servers would have been a matter of design choice. It is well within the level of one of ordinary

skill in the art to derive an appropriate data structure for associating servers and terminals to an application at hand.

As per claim 10, Pitkin discloses taking into consideration of transmit times [col.5 lines 59-68].

As per claim 11, Pitkin teaches having backup broker [col.3 lines 55-60].

As per claims 12-13, it is well known in the art that web browser has cache storing portion already retrieved. It is apparent in Kohda as modified, that the browser would check the cache prior to fetching the specific advertisement from the Advertiser Server.

As per claims 14-15, Kohda does not teach providing the composition of the second portion. The type of additional information return to the terminal would have been a matter of design choice. It would have been obvious for one of ordinary skill in the art to provide composition information because it would help the terminal in rendering the display of the portion.

As per claims 16-26, 27-35, 37-42, they are rejected under similar rationales as for claims 1-15 above.

As per claim 36, it is rejected under rationales as stated for claims 1 + 2 + 7 and 8 above.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dung Dinh

whose telephone number is (703) 305-9655. The examiner can normally be reached on Monday-Thursday from 7:00 AM - 4:30 PM. The examiner can also be reached on alternate Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenton Burgess can be reached at (703) 305-4792.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-9600.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, DC 20231

or faxed to:

(703) 308-9051, (for formal communications intended for entry)

(703) 305-9731 (for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington. VA., Sixth Floor (Receptionist).

Dung Dinh
Primary Examiner
February 26, 1999

Notice of References Cited

Application No.	Applicant(s)		
08/858,650	Griffiths et al.		
Examiner	Group Art Unit	Page 1 of 1	
Dung Dinh	~~2757~~ 2753		

U.S. PATENT DOCUMENTS

		DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS
	A	5,774,660	06/30/98	Brendel et al.	395	200.31
	B	5,341,477	08/23/94	Pitkin et al.	395	200.56
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

		DOCUMENT NO.	DATE	COUNTRY	NAME	CLASS	SUBCLASS
	N						
	O						
	P						
	Q						
	R						
	S						
	T						

NON-PATENT DOCUMENTS

		DOCUMENT (Including Author, Title, Source, and Pertinent Pages)	DATE
	U	NetGravity AdServer 2.0 Annoucement. Available at http://www.netgravity.com	10/96
	V	Kohda et al. "Ubiquitous advertising on the WWW: Merging advertisement on the browser," Computer Network and ISDN System, 28 (1996) 1493-1499.	5/96
	W		
	X		

NetGravity

FOR IMMEDIATE RELEASE
October 14, 1996

NetGravity Announces AdServer 2.0, Raises the Standard in Online Advertising Management Software

Industry-Leading Advertising Management Software Gives Sites Enhanced Targeting Ability, Modular Architecture, Greater Performance and Extensibility

SAN MATEO, Calif., October 14, 1996-NetGravity, the proven leader in online advertising management software, today announced the release of NetGravity AdServer™ 2.0, its industry-leading Internet advertising management software. NetGravity AdServer, used by more than 30 of the top advertising-supported sites on the Web -including Netscape, Time Inc.'s Pathfinder, CondéNet, Individual Inc. and Nations Restaurant News - was the first product developed specifically for Web sites to optimize the effectiveness and profitability of online advertising. NetGravity AdServer 2.0 delivers second generation online ad management, enhancing the performance, extensibility, reliability and targeting abilities of the product. NetGravity has experience in delivering mission-critical software to advertising-supported Web sites and offers 24 hour-a-day, seven-day-a-week support.

"For more than a year NetGravity has defined the market for online advertising management software," said John Danner, president of NetGravity. "We listened to our customers' requests while integrating further innovations into NetGravity AdServer 2.0, making it the only time-tested ad management product on the market. NetGravity realizes that when a revenue generating application is not working, a site is losing money. We deliver an ad management tool that is 100 percent reliable under the most demanding conditions."

Scalable, Distributed, Extensible, High Performance Architecture

The ability to serve ads efficiently and scale operations quickly is a must for any successful ad-supported site. NetGravity AdServer 2.0's scalable, distributed architecture delivers a number of benefits to customers, including intelligent caching and unlimited growth potential. AdServer 2.0 automatically remembers which ads have been scheduled for the most popular pages, greatly optimizing the speed at which ads get served. As a site grows, AdServer easily scales to support the additional traffic. AdServer's distributed architecture ensures the performance of a site will never be slowed down by serving ads. This distributed system also enables sites to run separate modules on different hardware platforms.

AdServer 2.0's extensibility enables sites to customize and extend AdServer functionality to suit their specific needs. For example, using NetGravity's API a Web site may choose to create custom reports to augment existing AdServer 2.0 reports. A Web site can also extend AdServer's targeting abilities by including additional custom targeting criteria.

"With the online advertising market heading towards $5 billion by the year 2000, it's crucial for sites to have access to the tools they need to manage placement and targeting," said Adam Schoenfeld, vice president publishing at Jupiter Communications. "Without powerful ad management tools, sites can't offer true value to their advertisers, and run the risk of turning their most crucial business relationships over to outsiders."

NetGravity AdServer Delivers 100 Percent Reliability

Proving its ability to meet the demands of almost any site on the World Wide Web, NetGravity is used by more than 30 of the most volume -and content-intensive sites. NetGravity AdServer manages the highest traffic site online, Netscape, demonstrating the scalability and reliability of the AdServer software.

"NetGravity has shown the ability to scale to Netscape's Internet site - which receives more than one hundred million hits a day," said Robert Andrews, Webmaster/director at Netscape. "NetGravity is consistently meeting our performance requirements and expanding along with Netscape"s phenomenal growth. NetGravity continues to implement new features, capabilities and problem solving solutions, such as their ability to operate on the multiple platforms that we support."

NetGravity AdServer 2.0 is also used on Time Inc.'s Pathfinder, the most complex publishing site online, demanding ad-specific targeting geared toward the specialized audiences of 90 different content providers.

"Pathfinder is one of the largest and most visited sites on the Web today," said Bruce Judson, general manager of Time Inc. New Media. "This traffic creates special challenges for managing our advertising base. The NetGravity AdServer 2.0 meets these challenges and gives Pathfinder advanced ad targeting performance and capability as well as robust reliability."

NetGravity AdServer 2.0 Delivers Distributed Architecture and Platform Portability

NetGravity AdServer 2.0's distributed, scaleable architecture allows sites to customize their configuration to meet their specific needs, adding components as the site grows. This component approach creates a high-performance system that accommodates the demands of each individual site. NetGravity AdServer 2.0 enables sites to easily migrate between different Web servers and hardware platforms. This modularity allows NetGravity's customers to upgrade affordably as their business scales.

NetGravity AdServer's Ad Targeting: Right Ad, Right Place, Right Time

NetGravity AdServer 2.0 allows for specific targeting by the user's browser type, computer platform, country of origin, proxy server, high-level domain, search terms and keywords, and time of day or day of the week. Sites can also use NetGravity AdServer's open API to extend their targeting, by creating their own target groups utilizing "cookie," demographic profiles from existing user databases or other information.

NetGravity AdServer 2.0 allows ad managers to target ads by keyword and subject matter. This targeting function delivers specified ads to complement the topic of the search. For instance, if the keyword is "car," an advertisement for a sport utility vehicle would be displayed in the winter months, and an ad for a convertible would appear in the summer. Targeting ads by subject matter allows sites to display advertising that directly relates to what the user is searching for at that moment. For example, an ad for Chardonnay might appear along with a search for a chicken recipe, while a Pinot Noir ad may come up when looking for a steak recipe.

"CondéNet is pleased to offer our advertisers the dynamic targeting and ad placement which the NetGravity AdServer allows us to deliver," said Sarah Chubb, director of CondéNet. "AdServer 2.0's reliability and NetGravity's superior customer service and support is helping us to create one of the

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unique, interactive advertising sites on the Web."

Advertiser Report Generation, Real-Time Copy Testing

NetGravity AdServer 2.0 enables sites to generate online performance reports for each advertiser. Sites can strengthen their partnership with agencies and advertisers by offering real-time copy testing of multiple creatives. This function allows advertisers and their agencies to make timely adjustments and corrections to their media campaigns, maximizing click-throughs, effectiveness and return on investment.

"Receiving performance reports from NetGravity sites has been fantastic in order to evaluate our media buys and make any rotation changes necessary in a timely manner." Melissa Hoban, media planner at J. Walter Thompson.

NetGravity AdServer 2.0 is the most advanced, reliable and dynamic tool for Web sites to fully realize revenue potential from advertising. NetGravity introduced and promotes the model that allows Web sites to retain 100 percent of advertising revenues, thereby enabling sites to build a viable economic business model.

About NetGravity

NetGravity, founded in September 1995 and based in San Mateo, Calif., is the proven leader in online advertising management software. Customers include Netscape, Time Inc.'s Pathfinder, Quote.com, CondéNet, Individual, Inc. and The Red Herring's herring.com. NetGravity can be found on the World Wide Web at http://www.netgravity.com.

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Computer Networks and ISDN Systems 28 (1996) 1493–1499

COMPUTER NETWORKS and ISDN SYSTEMS

Ubiquitous advertising on the WWW: Merging advertisement on the browser

Youji Kohda *, Susumu Endo †

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Abstract

We propose a new advertising framework on the WWW. Some popular WWW sites now provide advertising space in their Web pages. However the actual effectiveness of the advertising is questionable. In our advertising framework, an advertising agent is placed between advertisers and users. The agent's business is to deliver advertisements to users who wish to see advertisements on their Web browser. Users will see a variety of advertisements at the sites they visit, even if the sites have no advertisements on the Web servers. This will make the advertising business on the WWW really ubiquitous.

Keywords: World Wide Web; Advertisement; Advertising agent; I:1 future; Web server; Web browser; Web page; Web site

1. Introduction

To sell goods or services, advertisement is the first step to making them available to the public. TV and newspapers are representative media that have advertising spaces for commercial purposes. The operational cost of commercial TV stations and newspaper publishing companies is covered by the advertising revenue. This makes it possible for people to receive TV programs at no charge and to subscribe to newspapers very cheaply.

The World Wide Web is a new way of presenting information to the public via the Internet. Advertising on the World Wide Web has increased rapidly over the last few years. However, the mode of advertising has so far been similar to that used in TV and newspapers in essence.

Service providers on the WWW such as Yahoo! [1], a popular Internet directory service, prepare advertising space in their Web pages and sell this space to advertisers by the hour. The anchors (links to advertiser's Web servers) are placed on the sold small spaces, and are displayed to users as small clickable images. When they click one of the anchors, they are then connected to that advertiser's own commercial Web server.

WWW advertising in its current state is better than nothing, but the cost benefit is questionable, for the following reasons. Firstly, the host Web server must be very popular on the Internet. If the host is not sufficiently popular, the number of the people seeing advertisements placed on the server will be small. Secondly, the advertising host server does not usually permit a competitor company's advertise-

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ments to be displayed. For instance, Microsoft is most unlikely to advertise IBM products in their Web server.

Therefore, the advertising host server should be very popular on the Internet and, at the same time, unbiased, to earn enough money from the advertising business. Network directory services and virtual shopping/business malls are possible candidates. However, the services offered by such servers are gateway services in essence. Users are normally busy searching for information resources through the gateway services, and there is no reason for them to waste their time reading advertisements. This creates an "advertising vacuum".

We propose a new advertising framework on the World Wide Web. It will fill this "advertising vacuum". An advertising agent is placed between the advertisers and the users. Advertisements fetched from advertisers' Web servers are merged with Web pages from ordinary Web servers by the agent, and the merged pages are displayed on the users' Web browser. Thus, the users see advertisements on any server around on the Internet. Moreover the agent has chances to deliver appropriate advertisements which suit each user's taste. This is a move away from the current state of advertising on the WWW and will make the advertising business on the WWW really ubiquitous.

2. A new framework for advertising on the WWW

Fig. 1 illustrates the ordinary usage of the WWW. This can be compared with Fig. 2, which is an overview of our new advertising framework. In Fig. 2, the advertising agent company's Web server is new. It has an important role: Delivering advertisements to be displayed.

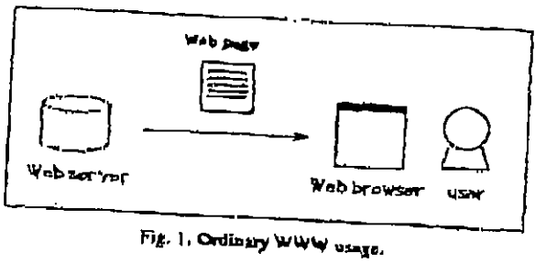


Fig. 1. Ordinary WWW usage.

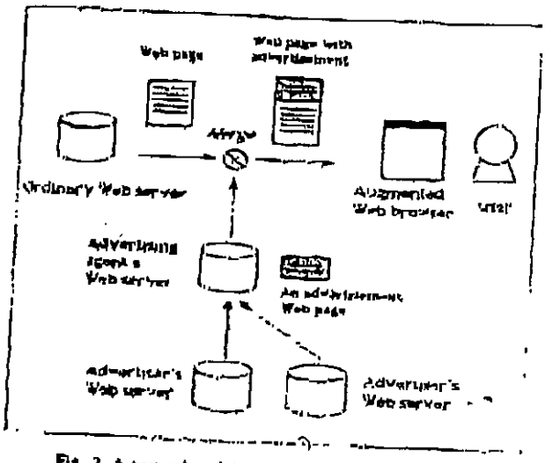


Fig. 2. A new advertising framework on the WWW.

Next, the advertising agent company also negotiates with users, who agree to see advertisements while browsing. This is similar to subscription procedure for technical magazines, which are full of technical articles and advertisements which target is the subscribers of the magazines. The agent company is responsible for delivering the appropriate advertisements to the users. Thus, the contract should at least allow the users to specify what categories of advertisements they wish to see. For example, a user can declare that he or she is interesting in new books, new personal computers, and used cars. It is wonderful if we could determine a user's current and long

2.1. Making contracts with advertising agents

First of all, the advertising agent company makes a contract with advertiser companies. Remark that ordinary users can become advertisers or advertising agents if they are ready to pay for it, but we use the word company, to make the explanation brief. The agent company is responsible for delivering advertisements to users. The advertisements are stored on the agent's Web server. Otherwise they might be kept on the advertiser's Web servers with just the links to them stored in the agent's Web server.

term interests with no declaration, but it is not quite ripe for the real use. Moreover the contract may request user's private information, such as sex, age, and home address in real life. If the agent has user's private information, it can pick up more focused advertisement for each user.

At last, the agent company should offer some clear benefit to attract the users to the business, because people do not positively want to see advertisement. The agent company could pay for all or part of the customers' connection charges.

2.2. Delivering advertisements to customers

Users who have made a contract with an advertising agent are given a Web browser by the agent. The Web browser software knows how to receive advertisements from the agent. Technically, the browser merges Web pages fetched from more than one Web server and displays a composite Web page on the window. In Section 3, we will describe the browser mechanism in some detail. You will find the modification to the current browsers is very small and reasonable.

When a user clicks an anchor on a page displayed on the browser, the browser contacts the Web server and returns a Web page designated by the anchor. Simultaneously, the browser contacts the advertising agent's Web server. The agent's Web server returns a Web page of one of its advertisements. Then the browser merges those returned Web pages, and displays a composite page on the screen.

Note that the agent is aware of the identity of the user and which page the user is about to read on the browser, so the advertising agent can tailor advertisements for *individuals and their current interests*. Thus it prevents the user from having to see advertisements that are unrelated to their current interests. Unexpected advertisements would irritate users in much the same way as a magazine article that is split up with intervening advertisements.

2.3. Assessing advertising agents

Advertisements returned from the advertising agent's Web server can have links to other pages which might, for example, be more detailed advertisements or online order forms for the advertised goods or services. When users follow these links, the advertising agent can detect these actions: Who, when, to what page. The agent records the actions, and the accumulated record can be used by the agent to show the effectiveness of their services to the advertisers.

2.4. Competition between advertising agents

An advertising agent must have a good strategy in order to beat the competition. The role of an advertising agent company is to offer mutual benefits to advertisers and users. If the users feel there are no benefits from using the services of one advertising agent, they will go to another. Similarly, if advertisers judge from the records that their advertisements have not been delivered to appropriate users, they will also go to another advertising agent.

There are three possible strategies for an advertising agent. Firstly, there is no need to deliver advertisements continuously. It might be more effective and impressive to deliver advertisements at some intervals. Secondly, other useful information, such as the latest news and latest weather information, might be delivered instead of advertisements at the user's convenience. Thirdly, more "intelligent" advertising is possible. Suppose that a user obtains an online order form for some goods. The advertising agent can detect this event. It then examines the order form to see what goods the user wants and the price offered. Then the advertising agent can create a special offer and deliver it to the user, which tells the user that another company (one of the agent's advertisers) would sell the same goods at a lower price than the company that has the online order form.

2.5. Privacy issues

In the Internet, privacy is one of the first issues. Advertising agents keep their customer's private information, such as age and home address. Therefore the contract between advertising agents and the customers should include a privacy clause which prohibits the agents from forwarding their private information to advertisers without permission.

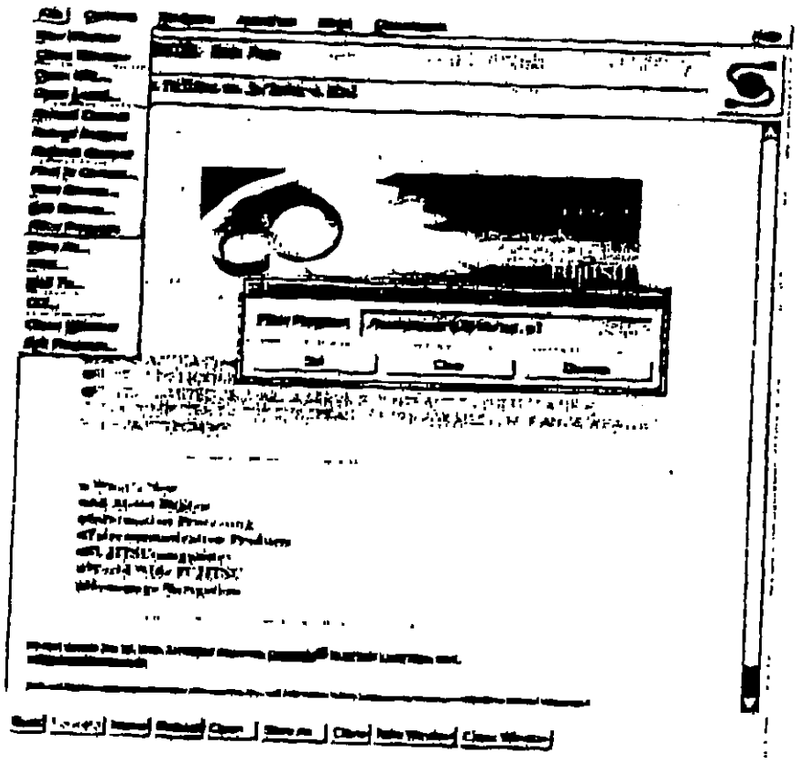


Fig. 3. "Filter Program" menu item is added.

3. A prototype of ubiquitous advertising on the WWW

In this section we describe a simple prototype of our new advertising framework.

3.1. Invoking filter programs when opening URLs

We use a sightly augmented Web browser which can merge Web pages from different Web servers. As shown in Fig. 3, a special "Filter Program" menu item has been added to the ordinary browser. Selecting this item, a window is opened and the names of filter programs can be specified. Filters are programs "which have one input, one output, and perform a useful transformation on data as it passes

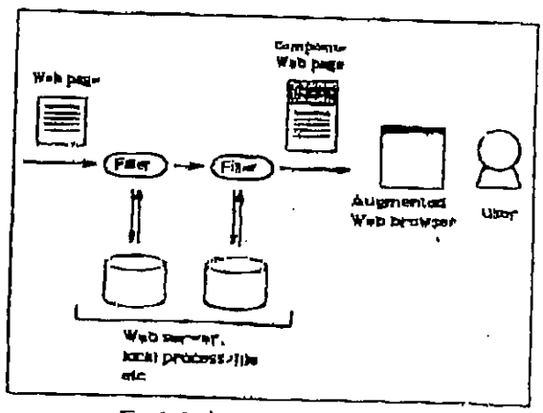


Fig. 4. A pipeline of filter programs.

through [2]". Those filters can be piped in order as illustrated in Fig. 4.

The filters are invoked when an anchor is clicked in the browser's window. At invocation, environment information is passed to each filter program as invocation parameters. The environment information includes at least the identity of the user and information about the selected anchor. The contents of a Web page designated by the anchor are input into the pipe of filters, and the output from the pipe is displayed on the browser's window as an HTML document.

3.2. A filter program which weaves advertisements

A special filter program is shipped from the advertising agent to a user, once the user has made contract with the agent, and the user puts the filter program in his/her browser. The filter keeps in memory the contact path (URL) to the agent's Web server. When it is invoked, it forwards the invocation parameters passed from the browser to the agent's Web server, and waits for a reply. Then, the agent's Web server returns one of its advertisements or other useful information. The filter merges the reply from the agent's Web server before the input from the pipe, i.e., Web pages from other Web servers.

Fig. 5 is an example of a Web page with an advertisement; a new product advertisement and a Home page. The strategy on how to weave advertisements in this example is quite easy; advertisement is inserted before. Please note that the advertisement in Fig. 5 has an anchor (labeled as "For More Information") in it. When a user clicks this anchor, a more

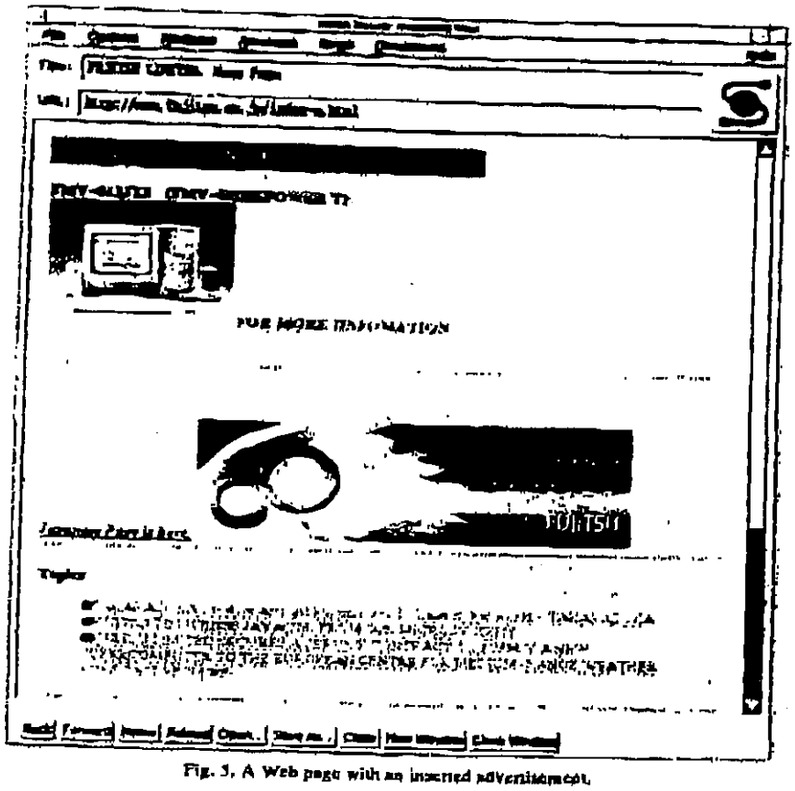


Fig. 5. A Web page with an inserted advertisement.

detailed advertisement would be displayed. At the same time, the click action is recorded at the advertising agent. The advertising agent can show a summary of the record whenever the advertisers request it.

3.3. Comments on the current implementation

We have already implemented a working prototype of this ubiquitous advertising on the WWW. Figs. 3 and 5 are snapshots taken from the computer screen.

We have made a very small improvement to NCSA Mosaic. We have added a new menu item, "Filter Program", just after "Edit Source.," menu item. "Edit Source.," in NCSA Mosaic invokes an editor whose initial content is the HTML document of the currently displayed Web page. When exiting the editor, the edited HTML document is displayed as a new Web page. Filter programs set by "Filter Program" menu item do the almost same work without user intervention. For example, if we put a "capitalize" filter (though it should remain intact between <A> and </A>), the characters displayed on the browser are all capitalized. We believe that this additional feature is simple and powerful, and therefore it is reasonable to add this feature to ordinary browsers as a standard facility. Instead, a specially tailored proxy server could realize the same functionality, but authentication of users should be incorporated in the proxy server at the same time to distinguish individuals.

A sample filter program which inserts advertisements before the original Web contents has been coded in Perl, which includes access to remote Web servers. This advertisement-insertion needs extra time and might make users irritated, but we believe this performance degradation will soon become smaller.

A sample Web server for advertising agents has been implemented as a set of Perl programs which are invoked through CGI. The programs include a program for advertisement delivery that searches an appropriate advertisement and delivers it to the browser, when the advertisement-insertion filter program set in the browser invokes the program via CGI. The call address to the delivery program will be coded in the filter program at the shipping time. The programs also include two programs for contracts, one for agent-to-user, the other for agent-to-advertiser. This means that users and advertisers can make a contract with an advertising agent on the Internet just with their Web browsers.

In this paper, we have proposed and prototyped the ubiquitous advertising on the WWW. However further research effort is still necessary, e.g., a test for advertiser/consumer acceptance, before putting this idea in the market.

One more comment on privacy issues. You can take off the advertisement-insertion filter program temporarily from your browser anytime you want, when you want to escape from the "supervision" of your advertising agent. This guarantees your freedom of exploration in the Internet, though you might miss some useful and important advertisements for you.

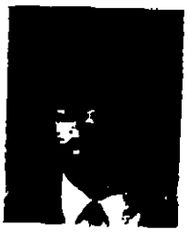
4. Conclusion

We have proposed a new advertising framework, in which an advertising agent plays a central role. It delivers advertisements to users under contract and the advertisements are woven into ordinary Web pages on the browser. This differs from the current advertising technology in WWW; advertisements are woven in the servers which users contact. The PostCast Network is a typical example, which delivers personalized news, weather and other information, possibly including advertisements, through a special browser [3].

Our proposed framework can be seen as one feasible step toward 1:1 advertising on the WWW [4]. First, the advertisement is merged into an ordinary Web page on the Web browser, instead of on the Web servers. Hence, users could encounter a variety of advertisements on any server in the world. Secondly, the advertisement delivered is chosen, according to the user and the Web page he or she is about to read. Therefore, it focuses advertisements on the interests of the user. Thirdly, the actions of users in relation to a particular advertisement (i.e., reading its details or buying the goods or services) are recorded by the advertising agent. This record can be used to prove the effectiveness of the advertising agent to the advertisers.

References

[1] Yahoo!: Internet Directory. http://www.yahoo.com/
[2] B.W. Kernighan and P.J. Plauger, *Software Tools*, Addison-Wesley, Reading, MA (1976).
[3] PointCast: Internet News Network. http://www.pointcast.com/
[4] D. Peppers and M. Rogers, *The 1:1 Future: Building Relationships One Customer at a Time*, Doubleday, New York, 1st ed. (1993) ISBN 0-385-42528-7.



Youji Kohda received the B.S. degree in Information Science and M.E. and Dr. Eng. degrees in Information Engineering from University of Tokyo, Tokyo, Japan, in 1981, 1983, and 1986, respectively. In 1986, he joined Fujitsu Limited, and in 1990 he joined Fujitsu Laboratories Ltd. His research interests include advanced user interface, groupware and socialware.

Susumu Endo received the B.E. degree in Information Engineering and M.S. degree in Information Science from Tohoku University, Sendai, Japan, in 1992 and 1994, respectively. In 1994, he joined Fujitsu Laboratories Ltd. He has been engaged in research on socialware.

08/02, 99

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FAX COVER SHEET

TO: Examiner Le H. Luu
U.S. Patent and Trademark Office
Phone: (703) 305-9650
Fax: (703) 305-7201

FAX RECEIVED
AUG 16 1999
Group 2700

FROM: Scott B. Allison

DATE: August 13, 1999

RE: Title: Method for Counting Displays of Banners On Terminals Connected to A Computer Network
Our File No.: 18022-002

TOTAL NUMBER OF PAGES INCLUDING THIS ONE: 19

ORIGINAL TO FOLLOW BY MAIL: YES _____ NO x
If you do not receive all pages, please call (303) 546-1300 immediately.
Our fax number is (303) 449-5426.

LONG DISTANCE CALL: YES x NO _____
CB&J MATTER NUMBER: 18022-002

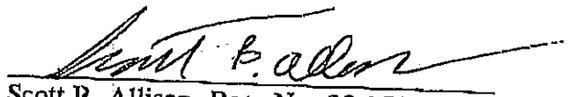
COMMENTS: Please see attached Communication to Examiner.

(b) Khoda et al., "Ubiquitous advertising on the WWW: Merging advertisement on the browser," *Computer Network and ISDN System*, 28 (1996) 1493-1499. 5/96.

Both of the latter two articles were cited in the corresponding pending U.S. patent application serial number 08/858,650.

Dated this 13th day of August, 1999.

Respectfully submitted,



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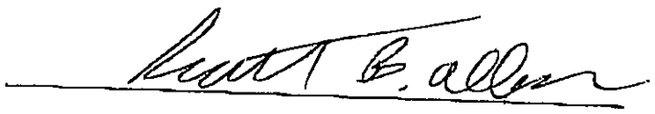
CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that this correspondence is being transmitted via facsimile to Examiner Le H. Luu, (703) 305-7201 at the U.S. Patent and Trademark Office on this 13th day of August, 1999.



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Respectfully submitted,

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Telephone: (303) 546-1300

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PTO/SB/01 (11-90)

DECLARATION FOR PATENT APPLICATION

DOCKET NUMBER (Optional) 18022-002

OFFICIAL

As below named inventor, I hereby declare that:

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

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventors (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled A SYSTEM USING FIRST BANNER REQUEST THAT CAN NOT BE BLOCKED FROM REACHING A SERVER FOR ACCURATELY COUNTING DISPLAYS OF BANNERS ON NETWORK TERMINALS (AS AMENDED), the specification of which is attached hereto unless the following box is checked:

FAX RECEIVED

AUG 16 1999

Group 2700

[X] was filed on June 11, 1997 as United States Application Number or PCT International Application Number 08/872,971 and was amended on March 10, 1999 and on June 2, 1999.

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

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

Prior Foreign Applications(s)	Priority Claimed	Priority Claimed	
(Number)	(Country)	(Day/Month/Year Filed)	[ ] Yes [ ] No

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

08/858,650	5/19/97	pending
(Application Number)	(Filing Date)	(Status - patented, pending, abandoned)

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:
JAMES R. YOUNG, Reg. No. 27,847; THOMAS C. FOLSOM, Reg. No. 35,514; STEVEN C. PETERSEN, Reg. No. 36,238; SCOTT B. ALLISON Reg. No. 38,370; KENT A. LEMBKE, Reg. No. P-44,866; AND AGENT SARAH S. O'ROURKE, Reg. No. 41,226

Address all telephone calls to Scott B. Allison at telephone number (303) 546-1300
Address all correspondence to Scott B. Allison, Chrisman, Bynum & Johnson, 1900 Fifteenth Street, Boulder, Colorado 80302

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

Full name of sole or first inventor (given name, family name) Michael John Griffiths

Inventor's signature X _____ Date AUG 10 1999

Residence 11334 North Eaton Way, Broomfield, Colorado 80020 Citizenship Canada
Post Office Address 11334 North Eaton Way, Broomfield, Colorado 80020

PTO/SB/01 (11-9

DECLARATION FOR PATENT APPLICATION

DOCKET NUMBER (Optional)
18022-002

OFFICIAL

As below named inventor, I hereby declare that:

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

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventors (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled A SYSTEM USING FIRST BANNER REQUEST THAT CAN NOT BE BLOCKED FROM REACHING A SERVER FOR ACCURATELY COUNTING DISPLAYS OF BANNERS ON NETWORK TERMINALS (AS AMENDED), the specification of which is attached hereto unless the following box is checked:

FAX RECEIVED

[X] was filed on June 11, 1997 as United States Application Number or PCT International Application Number 08/872,971 and was amended on March 10, 1999 and on June 2, 1999.

AUG 16 1999

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

GROUP 2700

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

Prior Foreign Applications(s)	Priority Claimed	Priority Claimed	
(Number)	(Country)	(Day/Month/Year Filed)	[ ] Yes [ ] No

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

08/858,650	5/19/97	pending
(Application Number)	(Filing Date)	(Status - patented, pending, abandoned)

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:
JAMES R. YOUNG, Reg. No. 27,847; THOMAS C. FOLSOM, Reg. No. 35,514; STEVEN C. PETERSEN, Reg. No. 36,238; SCOTT B. ALLISON Reg. No. 38,370; KENT A. LEMBKE, Reg. No. P-44,866; AND AGENT SARAH S. O'ROURKE, Reg. No. 41,226

Address all telephone calls to **Scott B. Allison** at telephone number **(303) 546-1300**
Address all correspondence to **Scott B. Allison, Chrisman, Bynum & Johnson, 1900 Fifteenth Street, Boulder, Colorado 80302**

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

Full name of sole or first inventor (given name, family name) **Michael John Griffiths**

Inventor's signature X _____ Date AUG 13/1999

Residence **11334 North Eaton Way, Broomfield, Colorado 80020** Citizenship **Canada**
Post Office Address **11334 North Eaton Way, Broomfield, Colorado 80020**

OFFICIAL

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Michael John Griffiths	)	
Serial No.:	08/872,971	)	Group Art Unit: 2317 2758
Filing Date:	June 11, 1997	)	
Title:	METHOD FOR COUNTING DISPLAYS OF BANNERS ON TERMINALS CONNECTED TO A COMPUTER NETWORK	)	Examiner: Dennis Pham
Our File No.:	18022-002	)	

FAX RECEIVED
AUG 16 1999
Group 2700

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. §§ 1.56, 1.97 and 1.98

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

Dear Sir:

The applicant hereby submits his Supplemental Information Disclosure Statement pursuant to 37 C.F.R. §§ 1.56, 1.97 and 1.98 and respectfully requests the Examiner to consider the information disclosed in the patents and publications listed below:

CITATIONS

U.S. Patents	Inventors	Issue Dates
5,774,660	Brendel et al.	June 30,1998
5,341,477	Pitkin et al.	August 23,1994
5,794,210	Goldhaber et al.	August 11, 1998
5,764,906	Edelstein et al.	June 9, 1998
5,781,550	Templin et al.	July 14, 1998
5,796,952	Davis et al.	August 18, 1998
5,712,979	Graber et al.	January 27, 1998

ARTICLES AND PUBLICATIONS

NetGravity Ad Server 2.0 Announcement. Available at *http://www.netgravity.com.* 10/96.

Khoda et al. "Ubiquitous advertising on theWWW: Merging advertisement on the browser," *Computer Network and ISDN System*, 28 (1996) 1493-1499. 5/96.

The Goldhaber, Edelstein et al. And Templin et al. references were cited in the Written Opinion by the International Preliminary Examining Authority and the Davis et al. and Graber et al. references were cited in the International Preliminary Examination Report in the counterpart foreign application, and are being submitted pursuant to M.P.E.P. Chapter 609-A(3) and B(2). A copy of the PCT Written Opinion and International Preliminary Examination Report are provided with the citations, and the Examiner is requested to reference item 2 in paragraph 2 in the PCT Written Opinion and item 2 of the International Preliminary Examination Report which are titled Citations and Explanations for the concise explanation of relevance of the cited references.

The Brendel et al. and Pitkin et al. references were cited in the corresponding pending U.S. patent application serial number 08/58,650.

Pursuant to C.F.R. §1.17(p), Applicant submits herewith check no.73524 in the amount of $240.00 as payment for the filing of this Supplemental Information Disclosure Statement.

One (1) page of Form PTO-1449 and copies of all the above-cited prior art and the International Preliminary Examining Authority's Written Opinion and International Preliminary Examination are enclosed for the Examiner's convenience. This Information

Disclosure Statement Under 37 C.F.R. §§ 1.56 and 1.97 is not to be construed that no other material information as defined in 37 C.F.R. §1.56(a) exists, or that these citations constitute prior art under 35 U.S.C. §102.

Dated this 17th day of March, 1999.

Respectfully submitted,

Scott B. Allison, Reg. No. 38,370
CHRISMAN, BYNUM & JOHNSON, P.C.
1900 Fifteenth Street
Boulder, Colorado 80302
Telephone: (303) 546-1300

CERTIFICATE OF MAILING UNDER 37 C.F.R. §1.8

I hereby certify that the foregoing SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R.§§ 1.56, 1.97 AND 1.98 together with PTO-Form 1449, copies of all recited prior art, and Check No.73524 in the amount of $240.00 were mailed by first-class U.S. mail, postage prepaid to the Assistant Commissioner for Patents, Washington, DC 20231 on this 17th day of March 1999.

OFFICIAL

RE: MatchLogic, Inc.
SERIAL NO.: 08/872,971
FILING DATE: June 11, 1997
FOR: Method for Counting Displays of Banners on Terminals Connected to a Computer Network
DATE: 17 March 1999
ITEMS ENCLOSED: 1.SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R.§§ 1.56, 1.97 AND 1.98; 2. PTO-Form 1449 WITH COPIES OF ALL RECITED PRIOR ART; 3. Check No.73524 IN THE AMOUNT OF $240.00; and 4. CERTIFICATE OF MAILING UNDER 37 CFR 1.8.

card and return it to us
Office of receipt of the

...e date stamped.
Our File No.: 18022-002

#9
SJK
9-15-99

CERTIFICATE OF MAILING UNDER 37 C.F.R. 1.8

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, DC 20231 on September 3, 1999.

Scott B. Allen

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Michael J. Griffiths James D. McElhiney	
Serial No.:	08/858,650	Group Art Unit: 2757
Filing Date:	May 19, 1997	Examiner: Dung Dinh
Title:	Information Storage and Delivery Over a Computer Network Using Centralized Intelligence To Monitor and Control the Information Being Delivered	
Our File No.:	18022-1	

REQUEST FOR THREE-MONTH EXTENSION OF TIME

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

Sir:

The applicant hereby requests a three-month extension of time from June 4, 1999 to September 3, 1999, in which to respond to the Office Action, Paper No. 7, dated March 4, 1999. Our Check Number 75582, in the amount of $435.00 is enclosed to cover payment of this three-month extension of time request. The applicants' Declaration to establish small entity status has been previously filed.

Respectfully submitted,

Dated: September 3, 1999

Scott B. Allison, Reg. No. 38,370
1900 Fifteenth Street
Boulder, Colorado 80302
Telephone: (303) 546-1300
Facsimile: (303) 449-5426

09/09/1999 HKAMARA 00000049 08858650
04 FC:217 435.00 OP

09/09/1999 HKAMARA 00000049 08858650
01 FC:203 324.00 OP
02 FC:202 156.00 OP

GAU-2757 #10

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Michael John Griffiths and James David McElhiney	)	
Serial No.:	08/858,650	)	Art Unit: 2757
Filing Date:	May 19, 1997	)	
		)	Examiner: Dung Dinh
Title:	INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMATION BEING DELIVERED	)	
Our File No.:	18022-001	)	

CERTIFICATE OF MAILING UNDER 37 C.F.R. 1.8

I hereby certify that the following:

1. Check No. 75582 in the amount of $435.00 for Three Month Request for Extension of Time;

2. Check No. 75585 in the amount of $480.00, filing fee for additional claims;

3. Check No. 75580 in the amount of $240.00, filing fee for Supplemental Information Disclosure Statement;

4. Form PTO-1083;

5. Request for Three Month Extension of Time;

6. Amendment Under 37 C.F.R. §1.111;

7. Supplemental Information Disclosure Statement; and

return postcard are being deposited with the United States Postal Service as first-class mail, postage prepaid, in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231, on this 3rd day of September, 1999.

Scott F. Allen

FORM PTO-1083

CASE DOCKET NO. 18022-001

In re Application of: Michael J. Griffiths and James D. McElhiney

Serial No.: 08/858,650

Filed: May 19, 1997

For: INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMATION BEING DELIVERED

THE COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

Sir:

Transmitted herewith is an amendment in the above-identified application.

_X_ Small entity status of this application under 37 CFR 1.9 and 1.27 has been established by a verified statement previously submitted

___ A verified statement to establish small entity status under 37 CFR 1.9 and 1.27 is enclosed.

___ No additional fee is required.

The fee has been calculated as shown below:

(Col. 1) CLAIMS REMAINING AFTER AMENDMENT	(Col. 2) HIGHEST NO. PREVIOUSLY PAID FOR	(Col. 3) PRESENT EXTRA	SMALL ENTITY RATE FEE	OR	OTHER THAN SMALL ENTITY RATE FEE
TOTAL 78	MINUS 42	= 36	x$9= $ 324		x$18= $
INDEP. 9	MINUS 5	= 4	x$39= $ 156		x$78= $
___MULTIPLE DEPENDENT CLAIMS			x$130= $		x$260= $
			TOTAL $ 480		TOTAL $

___ Please charge my Deposit Account No. _____ in the amount of $_____. A duplicate copy of this sheet is attached.

_X_ A check in the amount of $ 480.00 is attached.

_X_ The Commissioner is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account No. 03-1725. A duplicate copy of this sheet is attached.

_X_ Any filing fees under 36 CFR 1.16 for the presentation of extra claims.

_X_ Any patent application processing fees under 37 CFR 1.17.

Respectfully submitted,

Scott B. Allison

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#10
SK
9-15-99

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Michael John Griffiths and James David McElhiney	)	
Serial No.:	08/858,650	)	Group Art Unit: 2757
Filing Date:	May 19, 1997	)	Examiner: Dung Dinh
Title:	INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMATION BEING DELIVERED	)	
Our File No.:	18022-001	)	

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. §§ 1.56, 1.97 and 1.98

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

Dear Sir:

The applicants hereby submit their Supplemental Information Disclosure Statement pursuant to 37 C.F.R. §§ 1.56, 1.97 and 1.98 and respectfully request the Examiner to consider the information disclosed in the patents and publications listed below:

CITATIONS

U.S. Patents	Inventors	Issue Dates
5,712,979	Graber et al.	January 27, 1998
5,715,453	Stewart	February 3, 1998
5,727,129	Barrett et al.	March 10, 1998
5,742,768	Gennaro et al.	April 21, 1998
5,764,235	Hunt et al.	June 9, 1998
5,764,906	Edelstein et al.	June 9, 1998

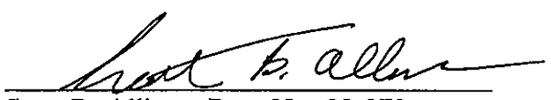
5,781,550	Templin et al.	July 14, 1998
5,781,739	Bach et al.	July 14, 1998
5,793,972	Shane	August 11, 1998
5,794,210	Goldhaber et al.	August 11, 1998
5,796,952	Davis et al.	August 18, 1998

Pursuant to C.F.R. §1.17(p), Applicants submit herewith check no. 75580 in the amount of $240.00 as payment for the filing of this Supplemental Information Disclosure Statement.

One (1) page of Form PTO-1449 and copies of all the above-cited prior art are enclosed for the Examiners convenience.

Dated this 3rd day of September, 1999.

Respectfully submitted,



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CERTIFICATE OF MAILING UNDER 37 C.F.R. §1.8

I hereby certify that the foregoing SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. §§ 1.56, 1.97 and 1.98, along with PTO-Form 1449 and copies of all recited prior art, was mailed by first-class U.S. mail, postage prepaid to the Assistant Commissioner for Patents, Washington, DC 20231 on this 3rd day of September, 1999.

FORM PTO-1449 (Rev. 7-80) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTY. DOCKET NO. 18022-001	SERIAL NO. 08/858.650
LIST OF PRIOR ART CITED BY APPLICANT (Use several sheets if necessary)	APPLICANTS: Griffiths, et al.	
	FILING DATE May 19, 1997	GROUP ~~2757~~ 2153

U.S. PATENT DOCUMENTS

*EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
AA	5,712,979	1/27/98	Graber et al.	395	200.11	
AB	5,715,453	2/3/98	Stewart	395	615	
AC	5,727,129	3/10/98	Barrett et al.	395	12	
AD	5,742,768	4/21/98	Gennaro et al.	295	200.33	
AE	5,764,235	6/9/98	Hunt et al.	345	428	
AF	5,764,906	6/9/98	Edelstein et al.	395	200.49	
AG	5,781,550	7/14/98	Templin et al.	370	401	
AH	5,781,739	7/14/98	Bach et al.	395	200.57	
AI	5,793,972	8/11/98	Shane	395	200.49	
AJ	5,794,210	8/11/98	Goldhaber et al.	705	14	
AK	5,796,952	8/18/98	Davis et al.	395	200.54	

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

EXAMINER D Davis 12/14/99

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

#11/A
55K
9-15-99

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Michael J. Griffiths James D. McElhiney	
Serial No.:	08/858,650	
Filing Date:	May 19, 1997	Group Art Unit: 2757
Title:	Information Storage and Delivery Over a Computer Network Using Centralized Intelligence To Monitor and Control the Information Being Delivered	Examiner: Dung Dinh
Our File No.:	18022-1	

AMENDMENT UNDER 37 C.F.R. § 1.111

To: Honorable Commissioner of
Patents and Trademarks
Washington, D.C. 20231

Dear Sir:

In response to the Patent Examiner's Office Action, Paper No. 7, dated March 4, 1999, please amend the above-identified patent application, as follows:

In the Specification:

On page 25, line 3, replace "The method 72" with --The prior art method 72--.

On page 34, line 19, before "302" insert --HTTP--.

On page 36, line 19, replace "stings" with --strings--.

On page 37, line 1, replace "bannersite1.cm" with --bannersite1.com--.

On page 50, line 15, insert --.-- after "response".

In the Claims:

Please cancel claims 2, 13, 26, 42 without prejudice to the subject matter claimed therein.

Please amend the claims as follows:

1. (Amended) A method for storing information on a primary server and one or more secondary servers and on computer sites connected to a computer network, wherein information delivered over the computer network to a terminal or a group of terminals may contain references to other information to be delivered to the terminal, comprising [the steps of]:

serving a first portion of [the] information to [the] a terminal, wherein said first portion of [the] information contains a reference to a second portion of [the] information;

[sending] causing a first request signal to be transmitted from the terminal to a [the] primary server requesting a location address for said second portion of [the] information from which said second portion of [said] information can be served to the terminal, wherein said first request signal cannot be blocked from reaching said primary server by either the terminal or any intermediary device located topologically between the terminal and the primary server as a result of previous caching of said first portion of information or said second portion of information in the terminal or said intermediary device;

sending a location signal from the primary server to the terminal providing said location address of said second portion of [the] information;

[sending] causing a second request signal to be transmitted from the terminal containing said location address of said second portion of [the] information and

A1

requesting said second portion of [the] information be served to the terminal; and

serving said second portion of [the] information to the terminal.

A2

3. (Amended) The method of claim 1 [2], wherein said second portion of [the] information is served from the primary or secondary servers.

6. (Amended) The method of claim 1, wherein said second portion of [the] information is served from one of the secondary servers.

7. (Amended) The method of claim 1, wherein after the primary server receives the first request signal from the terminal, further including [the step of] determining which server connected to the computer network is best suited for serving said second portion of [the] information to the terminal.

A3

8. (Amended) The method of claim [8] 7, wherein results of said determining [determination step] are included in said location signal sent from the information server to the terminal.

9. (Amended) The method of claim 8, including [the steps of] creating a matrix of selections between each of the terminals or groups of terminals and each of the servers and using said matrix to determine which of the servers is best suited to serve said second portion of [the] information to the terminals or groups of terminals.

A4

11. (Amended) The method of claim 1, including [the step of] making one of the secondary servers a new primary server if the original primary server becomes inaccessible.

12. (Amended) The method of claim 1, including [the step of] storing said second portion of [the] information in the terminal.

14. (Amended) The method of claim 4, including [the step of] selecting the composition of said second portion of [the] information.

15. (Amended) The method of claim 14, wherein the results of said composition selection [step] are included in said location signal sent from the information server to the terminal.

16. (Amended) A method for distributing a banner over a computer network to a device when the banner is referenced or linked to in a [hypertext] document served to the device, wherein the banner is stored in one or more servers, comprising [the steps of]:

[sending] receiving a first banner request signal from [the] a device [to] at a first server requesting that a banner be served to the device, wherein said first banner request signal cannot be blocked from reaching said first server by the device despite previous caching of said specified banner in the device;

sending a banner location signal from said first server to the device, wherein said banner location signal includes location information for a specified banner stored on a second server; and

[sending] receiving a second banner request signal from the device [to] at said second server requesting that the second server serve said specified banner to the device.

~~18.~~ 22 (Amended) The method of claim ~~16,~~ 20 including [the step of] determining which of the servers is best suited for serving said specified banner to the device.

~~19.~~ 23 (Amended) The method of claim ~~18,~~ 22 wherein said [step of] determining which of the servers is best suited for serving said specified banner to the device is performed in said

A4

first server after said first server receives said first banner request signal from the device.

26 ~~22.~~ (Amended) The method of claim ~~16~~ 20, including [the step of] storing said specified banner in said device.

27 ~~23.~~ (Amended) The method of claim ~~22~~ 26, including [the step of] determining whether said specified banner is stored in the device before said [step of sending] receiving said second banner request signal.

A7

28 ~~24.~~ (Amended) The method of claim ~~16~~ 20, including [the step of] selecting said specified banner prior to sending said banner location signal from said first server to the device.

Sub B3

27. (Amended) A method for [serving] enabling a web page and an associated banner to be served to a computer [running browser software], wherein the web page contains a link or other reference [links] to the banner, comprising [the steps of]:

serving [the] a web page to [the] a computer; [for display by the browser software];

A8

[sending] causing a banner request signal to be sent from the computer to a primary server requesting a banner be served to the computer, wherein said banner request signal includes [the] a Uniform Resource Locator address for said primary server and wherein said banner request signal cannot be blocked from being received by the primary server as a result of previous caching of the banner on the computer;

determining which specified banner will be served to the computer; and

sending a banner location signal from said primary server to the computer, wherein said banner location signal includes the Uniform Resource Locator address for a

device on which the specific banner to be served to the computer is stored.

29. (Amended) The method of claim 27, including [the step of] determining whether said specified banner is stored on the computer.

30. (Amended) The method of claim 29, wherein after said [step of] determining whether said specified banner is stored on the computer, if said specified banner is not stored on the computer then including [the step of sending] causing a [specified] second banner request signal to be sent to said device requesting that said device serve said specified banner to the computer.

34. (Amended) The method of claim 27, including [the step of] tagging said specified banner as being cachable.

36. (Amended) A method for distributing a banner over a computer network to a device when the banner is referenced or linked to in a hypertext document served to the device, wherein the banner is stored in one or more servers, comprising [the steps of]:

[sending] receiving a first banner request signal from the device [to] at a first server requesting that a banner be served to the device, wherein said first banner request signal [is not] cannot be blocked by the device or [any] an intermediary server located between the device and said first server as a result of a previous storage in the device or said intermediary server of a response to said first banner request signal sent from said first server to the device;

determining if said first server is best suited to serve said banner to the device and serving said banner to the device if said first server is best suited to serve said banner and,

if said first server is not best suited to server said banner to the device, sending a banner location signal from said first server to the device, wherein said banner location signal includes location information for a specified banner stored on a second server;

[sending] receiving a second banner location request signal from the device [to] at said second server requesting that [the] said second server serve said specified banner to said device if said first server is not best suited to server said banner to the device; and

serving said specified banner to said device from said second server if said first server is not best suited to server said banner to the device.

37. (Amended) A method for enabling distribution of [distributing] a banner over a computer network to a device when the banner is referenced in a document served to the device, wherein the banner is stored in one or more servers connected to the computer network, and the device is connected to the computer network via an intermediary server, comprising [the steps of]:

[sending] causing a first banner request signal to be transmitted from the device to a first server requesting that a banner be served to the device, wherein said first banner request signal is not blockable by the device or the intermediary server as a result of a storage in the device or the intermediary server of said requested banner prior to the generation of said first banner signal by the device;

sending a banner location signal from said first server to the device, wherein said banner location signal includes location information for [a specified] said requested banner stored on a second server; and

determining if said [specified] requested banner is stored on the device and, if said [specified] requested banner is not stored on the device, then [sending] causing a second banner request signal to be transmitted from the device to the intermediary server and determining if said [specified] requested banner is stored on the intermediary server, wherein if said [specified] requested banner is not stored on the intermediary server, [sending] causing at least a portion of said second banner request signal to be sent to said second server requesting that said second server serve said [specified] requested banner to said device.

41. (Amended) The method of claim 37, including [the step of] having said first server select said [specified] requested banner.

Kindly add the following new claims:

--43. A method for serving a banner to a client device, comprising:

receiving at a primary server a first request for a banner, said first request containing at least a portion of an initial URL, wherein said first request cannot be prevented from being received by the primary server despite previous storage of the banner on the client device;

sending a signal from the primary server to the client device that includes at least a portion of a second URL associated with the banner's location;

receiving at the primary server a second TCP/IP compliant request requesting that the banner be served to the client device if the banner is not stored on the client device;

serving the banner to the client device; and

counting at least one display of the banner on the client device.--

--~~44~~. The method of claim ~~43~~, wherein said first request includes the strings "cgi-bin" and "?".--

--~~45~~. The method of claim ~~43~~, wherein said signal sent from said primary server to the client device includes an HTTP 302 redirect command.--

--~~46~~. The method of claim ~~43~~, wherein said first request cannot be prevented from being received by the primary server as a result of previous caching or storing of the banner by an intermediary device connected to the computer network.--

--~~47~~. The method of claim ~~46~~, wherein said intermediary device is connected topologically on said computer network between the client device and the primary server.--

--48. A method for enabling accurate counting of displays of a banner on a client device, comprising:

receiving a first banner request signal at a first server requesting that a banner be served to a client device, wherein said first banner request signal cannot be prevented from being received by said first server, even though there has been previous caching or storing of said banner by the client device or an intermediary device;

sending a banner location signal to the client device, wherein said banner location signal includes location information for a specified banner stored on a second server; and

causing a determination of whether said specified banner is stored on the client device and, if said specified banner is not stored on the client device, receiving a second banner request signal from the client device at said intermediary device and causing a

determination of whether said specified banner is stored on said intermediary device, wherein if said specified banner is not stored on said intermediary device, receiving a third banner request signal at said second server requesting that said second server serve said specified banner to the client device.--

--~~49~~. The method of claim ~~48~~ 64, wherein said intermediary device is a proxy server--.

--~~50~~. The method of claim ~~48~~ 64, wherein said third banner request signal is identical to said second banner request signal.--

--~~51~~. The method of claim ~~48~~ 64, wherein said banner location signal includes an HTTP 302 redirect command.--

--~~52~~. The method of claim ~~48~~ 64, wherein said first banner request signal includes the strings "cgi-bin" and "?".--

--~~53~~. The method of claim ~~48~~ 64, wherein said first server and said second server are the same server.--

--~~54~~. The method of claim ~~48~~ 64, including serving said specified banner to the client device.--

--~~55~~. The method of claim ~~54~~ 70, including counting at least one display of said specified banner on the client device.--

--56. A method for serving a banner to a client device, comprising:

receiving at a primary server a first request signal for a banner, said first request signal containing at least a portion of an initial URL, wherein said first request signal cannot be prevented from being received by the primary server as a result of previous

caching of the banner in the client device;

sending a signal from the primary server to the client device that includes a second URL associated with the banner's location;

receiving a second request signal requesting that the banner be served to the client device if the banner is not stored on the client device; and

serving the banner to the client device.--

--~~57~~ 73. The method of claim ~~56~~ 72, including counting at least one display of the banner on the client device.--

--~~58~~ 74. The method of claim ~~56~~ 72, wherein said first request signal includes the strings "cgi-bin" and "?".--

--~~59~~ 2. The method of claim 1, wherein said intermediary device is a proxy server.--

--~~60~~ 13. The method of claim 1, wherein said first request signal includes the strings "cgi-bin" and "?".--

--~~61~~ 16. The method of claim 1, wherein said location signal includes an HTTP 302 redirect command.--

--~~62~~ 17. The method of claim 1, wherein said reference to a second portion of information includes at least a portion of a URL.--

--~~63~~ 18. The method of claim 1, wherein said first portion of information is a web page, said second portion of information is a banner, and said reference is a link.--

--~~64~~ 30. The method of claim ~~16~~ 20, including counting a display of said specified banner on said device.--

--~~65~~ 31. The method of claim ~~16~~ 20, wherein said location information includes at least a portion of a URL.--

--~~66~~ 32. The method of claim ~~16~~ 20, wherein said first request signal includes the strings "cgi-bin" and "?".--

--~~67~~ 33. The method of claim ~~16~~ 20, wherein said banner location signal includes an HTTP 302 redirect command.--

--~~68~~ 44. The method of claim ~~36~~ 43, wherein said document is a web page.--

--~~69~~ 45. The method of claim ~~36~~ 43, wherein said first banner request signal includes the strings "cgi-bin" and "?".

--~~70~~ 46. The method of claim ~~69~~ 45, wherein said banner relocation signal includes an HTTP 302 redirect command.--

--~~71~~ 47. The method of claim ~~36~~ 43, wherein said banner location information includes at least a portion of a URL.--

--~~72~~ 54. The method of claim ~~37~~ 49, wherein said first banner request signal includes the strings "cgi-bin" and "?".--

--~~73~~ 55. The method of claim ~~37~~ 49, wherein said banner location signal includes an HTTP 302 redirect command.--

--~~74~~ 56. The method of claim ~~37~~ 49, wherein the document includes at least a portion of a web page.--

--~~75~~ 57. The method of claim ~~37~~ 49, wherein said location information includes at least a portion of a URL.--

--76. A method for enabling a banner to be received at a client device, comprising:

generating at the client device a first request signal for a banner;

transmitting said first request signal to a server, wherein said first request signal cannot be prevented from being received by the server as a result of previous caching of the banner on the client device;

receiving at the client device a response signal from the server that includes a URL associated with the banner's location; and

transmitting a second request signal from the client device requesting that the banner be served to the client device.--

--~~77~~ 76. The method of claim ~~76~~ 75, wherein said first banner request signal includes the strings "cgi-bin" and "?".--

--~~78~~ 77. The method of claim ~~76~~ 75, wherein said response signal includes an HTTP 302 redirect command.--

--~~79~~ 78. The method of claim ~~76~~ 75, including receiving the banner at the client device.--

--~~80~~ 79. The method of claim 1, including counting at least one display of said second portion of information on the terminal.--

--~~81~~ 48. The method of claim ~~36~~ 43, including counting at least one display of said specified banner on the device.--

--~~82~~ 58. The method of claim ~~37~~ 49, including counting at least one display of said specified banner on the device.--

REMARKS

In the Office Action, Paper No. 7, dated March 4, 1999, the Patent examiner rejected claims 1-42 under 35 U.S.C. § 103 as being unpatentable over the article to *Kohda et al.* in view of U.S. Patent No. 5,431,477 issued to *Pitkin et al.*

The applicants have carefully considered the patent examiner's rejections, the reasons for the rejections, and the prior art cited by the patent examiner. In response, the applicants have deleted claims 2, 13, 26, and 42 and added new claims 43-82. In addition, the applicants have amended claims 1, 3, 6, 7, 8, 9, 11, 12, 14 ,15, 16, 18, 19, 22, 23, 24, 27, 29, 30, 34, 36, 37, and 41 to define more clearly the essence of their invention. Please note that the applicants do not desire or intend that any elements of any of the pending claims be construed as being in step-plus-function claim element format and none of the elements of any of the pending claims should be construed as being in such step-plus-function claim element format. The applicants have also amended the specification to correct inconsistencies noted by the applicants. No new matter is introduced by this amendment.

The Applicants' Invention and the Prior Art References Cited by the Patent Examiner

Turning now to the substantive rejections of the applicants' claims over the *Kohda et al.* and the *Pitkin et al.* references, it is important to first put those two references in perspective with the applicants' invention. In order to do so, it is also important to recognize at least four of the fundamental principles of the applicants' invention.

First, applicants' invention is specifically directed to the serving of banners or other information from a server device to a client device via a computer network and the accurate

counting of such display of banners or other information on the terminal or client device. *See*, Applicants' disclosure, page 5, line 20 to page 6, line 1; page 11, line 17 to page 12, line 3; page 13, line 19 to page 14, line 9; page 39, lines 6-17. Inaccurate counting of banner displays on the client device is often caused by previous caching or storage of the banner on the client device or on proxy servers, or other intermediate devices topologically connected between the client device and the server device, which prevent requests or request signals for the banners generated or sent by the client device from reaching the server device. Thus, as a result of such caching or storage of the banners on the client device, proxy servers, or other intermediate devices, such requests or request signals are blocked or otherwise prevented from reaching the server device. *See*, Applicants' disclosure, page 11, line 20 to page 12, line 3; page 12, line 16 to page 13, line 18; page 18, line 8 to page 22, line 1; page 25, line 3 to page 26, line 5. Applicants' invention reduces the inaccurate display counting caused by caching of the banners by making or causing request signals generated or transmitted by a client device unblockable by the client device or proxy server, even though the banners may have been previously stored on the client device or proxy server. Therefore, despite such caching or storage of the banners on the client device, proxy servers, or other intermediate devices, the request signals generated or transmitted by the client device cannot be blocked or prevented from reaching the server device. In other words, the request signals generated by the client device cannot be blocked or prevented from reaching the server device as a result or consequence of previous caching or storage of the banners on the client device, proxy servers, or other intermediate devices. *See*, Applicants' disclosure, page 28, line 9 to page 29, line 10. It should be noted that no specific limitations are intended by the use

of the terms "terminal," "device," "client device," or "server" as those terms are used in the applicants' patent application, in the applicants' claims, or in this response to the first Office Action.

Second, applicants' invention allows such serving and counting to occur without significantly increasing data traffic on the computer network or unnecessarily delaying the display of the banners or other information on the client device. *See*, Applicants' disclosure, page 5, lines 2-4; page 26, line 17 to page 27, line 15; page 28, lines 9-13; page 37, lines 5-15. Applicants' invention controls the use of cached banners or advertisements such that accurate counting of displays of the banners and advertisements can be made, as previously discussed above, but allows and takes advantage of caching when appropriate and possible to reduce congestion or unnecessary data traffic on the computer network. *See*, Applicants' disclosure, page 39, line 18 to page 40, line 10.

Third, applicants' invention allows banners or advertisements to be targeted to users to increase the banners' or advertisements' effectiveness. *See*, Applicants' disclosure, page 5, lines 18-19; page 28, lines 14-16; page 38, line 18 to page 39, line 2. Therefore, applicants' invention allows advertisements to be selected for display to a user based on demographic or other information known about the user and uses content general or content specific request signals as part of the disclosed method. *See*, Applicants' disclosure, page 28, lines 5-8; page 38, line 18 to page 39, line 2.

Fourth, applicants' invention increases fault tolerance and reliability for information and banner delivery and storage systems, thereby increasing the ability to continuously serve

information and banners to clients or client devices. *See*, Applicants' disclosure, page 6, lines 5-7; page 40, line 11 to page 41, line 20; page 48, line 16 to page 50, line 15. Mirroring and redundancy of banners and other information also allows for more efficient delivery of such banners and other information to clients or client devices. *See*, Applicants' disclosure, page 50, line 16 to page 51, line 10.

In contrast to the applicants' invention, the *Kohda et al.* reference is directed to an advertising framework in which users, "who agree to see advertisements while browsing," negotiate with advertising agents so as to allow tailored advertising to be delivered by the advertising agents to the users. Thus, the users make a contract with the advertising agent. *See*, *Kohda et al.* reference, pages 1494-1495.

Once a contract is established between a user and an advertising agent, the agent provides the user with a special filtering browser by the agent that allows the agent to track all pages and advertisements served to the user. In addition, the filter is displayed as part of the browser software on the user's computer.

> The filter keeps in memory the contact path (URL) to the agent's Web server. When it is invoked, it forwards the invocation parameters passed from the browser to the agent's Web server, and waits for a reply. Then the agent's Web server returns one of its advertisements or other useful information. The filter merges the reply from the agent's Web server before the input from the pipe, i.e., Web pages from other Web servers.

See, Kohda et al. reference, page 1497. In this disclosed scheme, the agent controls the advertisements served to the user and a predefined relationship must exist between the user and the agent. Furthermore, the agent's browser must be modified by the filtering software to allow the agent to "detect" the actions initiated by the user. *See, Kohda et al.* reference, page 1495.

The agent also detects all events initiated or undertaken by the user, thereby allowing the agent to develop an accumulated record of the user's interests and activities. *Id.*

While the *Kohda et al.* reference is related to advertising, it simply does not recognize or address the problems encountered with accurate counting of banners served to users, particularly the need to provide accurate counting without significantly increasing computer network data traffic. More specifically, *Kohda et al.* do not teach or even recognize the problems associated with accurate counting of banners delivered to client devices created by caching of such banners on the terminal or other devices topologically located between the terminal and a server. In fact, *Kohda et al.* do not even discuss the caching of banners on a terminal. Moreover, in contrast to the applicants' invention, *Kohda et al.'s* disclosed method requires a user-selected agent that controls the advertising delivered to the user and specialized browser software to allow the agent to detect and monitor user activity.

The *Pitkin et al.* patent is directed to the allocation of resources within a computer network architecture. Unlike the applicants' invention, however, *Pitkin et al.* do not teach or even address the concept of serving advertisements, information, banners, etc. in an efficient manner that promotes the accurate counting of displays of such advertisements, information, banners, etc.

Obviousness Rejections

The Patent Examiner rejected claims 1-42 under 35 U.S.C. § 103(a) as being unpatentable over the *Kohda et al.* reference in view of the *Pitkin et al.* patent. The applicants respectfully disagree that the combination of these references results in the applicants' claimed invention. In

addition, the applicants point out that the *Kohda et al.* and *Pitkin et al.* references are directed to very different problems in non-analogous areas. Therefore, the Patent Examiner's combination of these references is improper. The combination of elements from non-analogous sources, in a manner that reconstructs the applicants' invention only with the benefit of hindsight, is insufficient to present a *prima facie* case of obviousness. In re Oetiker, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). Moreover, one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to replicate the claimed invention. In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Care must be taken to avoid hindsight reconstruction by using the patent in suit as a guide through the maze of prior art references, combining the right references in the right way so as to achieve the result of the claims in suit. Grain Processing Corp. v. American Maize-Products Corp., 840 F.2d 902, 5 USPQ2d 1788 (Fed. Cir. 1988).

Kohda et al. do not address the problems identified by *Pitkin et al., i.e.*, the allocation of resources within a computer network architecture. Moreover, *Pitkin et al.* do not address or even suggest the problems identified by *Kohda et al., i.e.*, delivery of targeted advertisements. The inquiry into obviousness is not whether each element existed in the prior art, but whether the prior art made obvious the invention as a whole for which patentability is claimed. Hartness International, Inc., v. Simplimatic Engineering Co., 819 F.2d 1100, 2 USPQ2d 1826 (Fed. Cir. 1987). Furthermore, without some suggestion or incentive in the prior art, independent of applicants' claims, it is improper to combine the prior art references in a manner necessary to show the applicants' invention in a 35 U.S.C. § 103 obviousness rejection. In re Samour, 197

USPQ 1 (CCPA 1978); In re Rinehart, 189 USPQ 143 (CCPA 1976); Ex parte Shepard and Gushue, 188 USPQ 536 (Bd. Pat. App. & Int. 1974). Among other things, since the inventions disclosed in the *Kohda et al.* or *Pitkin et al.* references are directed to such different problems, and since any combination of the inventions disclosed in the *Kohda et al.* or *Pitkin et al.* references would require extensive or cumbersome modifications to either or both of the inventions disclosed in the *Kohda et al.* or *Pitkin et al.* references, there is simply no suggestion or teaching in either the *Kohda et al.* or *Pitkin et al.* references to combine them in any fashion whatsoever.

In addition to the above, as previously discussed, neither the *Kohda et al.* nor *Pitkin et al.* references address or even suggest the goal of accurate counting of banner displays with efficient delivery of such banners to client devices, or the problems in reaching such a goal created by previous caching of a banner. Furthermore, neither the *Kohda et al.* nor *Pitkin et al.* references disclose or even fairly suggest the need to prevent blocking of request signals for a banner or other information from reaching a server as a result of previous caching or other storage of the banner or other information on a device other than the server. While the banner request signals discussed in the *Kohda et al.* reference may reach a server, there is no guarantee that such signals will not be blocked or otherwise prevented from reaching the server as a result of previously caching of a requested banner. Therefore, even if the teachings of the *Kohda et al.* and *Pitkin et al.* references are combined, neither the *Kohda et al.* nor *Pitkin et al.* references teach or fairly suggest causing a first request signal to be transmitted from the terminal to a primary server requesting a location address for said second portion of information from which said second

portion of information can be served to the terminal, wherein said first request signal cannot be blocked from reaching said primary server by either the terminal or any intermediary device located topologically between the terminal and the primary server as a result of previous caching of said first portion of information or said second portion of information in the terminal or said intermediary device, as recited in applicants' amended independent claim 1; receiving a first banner request signal from a device at a first server requesting that a banner be served to the device, wherein said first banner request signal cannot be blocked from reaching said first server by the device despite previous caching of said specified banner in the device, as recited in applicants' amended independent claim 16; causing a banner request signal to be sent from the computer to a primary server requesting a banner be served to the computer, wherein said banner request signal includes a Uniform Resource Locator address for said primary server and wherein said banner request signal cannot be blocked from being received by the primary server as a result of previous caching of the banner on the computer, as recited in applicants' amended independent claim 27; receiving a first banner request signal from the device at a first server requesting that a banner be served to the device, wherein said first banner request signal cannot be blocked by the device or an intermediary server located between the device and said first server as a result of a previous storage in the device or said intermediary server of a response to said first banner request signal sent from said first server to the device, as recited in applicants' amended claim 36; or causing a first banner request signal to be transmitted from the device to a first server requesting that a banner be served to the device, wherein said first banner request signal is not blockable by the device or the intermediary server as a result of a storage in the

device or the intermediary server of said requested banner prior to the generation of said first banner signal by the device, as recited in applicants' amended claim 37. Thus, applicants' amended independent claims 1, 16, 27, 36, and 37 are non-obvious and allowable over the *Kohda et al.* or *Pitkin et al.* references or any other references cited by the Patent Examiner or provided by the applicants' in their Supplemental Information Disclosure Statement filed concurrently herewith.

In addition to the above, neither the *Kohda et al.* nor *Pitkin et al.* references teach or fairly suggest receiving at a primary server a first request for a banner, said first request containing at least a portion of an initial URL, wherein said first request cannot be prevented from being received by the primary server despite previous storage of the banner on the client device, as recited in applicants' new independent claim 43; receiving a first banner request signal at a first server requesting that a banner be served to a client device, wherein said first banner request signal cannot be prevented from being received by said first server, even though there has been previous caching or storing of said banner by the client device or an intermediary, as recited in applicants' new independent claim 48; receiving at a primary server a first request signal for a banner, said first request signal containing at least a portion of an initial URL, wherein said first request signal cannot be prevented from being received by the primary server as a result of previous caching of the banner in the client device, as recited in applicants' new independent claim 56; or transmitting said first request signal to a server, wherein said first request signal cannot be prevented from being received by the server as a result of previous caching of the banner on the client device, as recited in applicants' new independent claim 76. Moreover,

neither the *Kohda et al.* nor *Pitkin et al.* references teach or fairly suggest counting at least one display of the banner on the client device, as recited in applicants' claim 43. Therefore, applicants' new independent claims 43, 48, 56 and 76 are non-obvious and allowable over the *Kohda et al.* or *Pitkin et al.* references or any other references cited by the Patent Examiner or provided by the applicants' in their Supplemental Information Disclosure Statement filed concurrently herewith.

In addition to the above, neither the *Kohda et al.* nor *Pitkin et al.* references teach or fairly suggest the use of "cgi-bin" and "?" strings, as recited in applicants' dependent claims 44, 52, 58, 66, 69, 72, and 77 and supported in page 36, line 14 to page 37, line 4 of the applicants' original disclosure, the use of HTTP 302 redirect commands, as recited in applicants' dependent claims 32, 45, 51, 60, 67, 70, 73, 78 and supported in page 34, lines 1-18 and claim 32 of the applicants' original disclosure, or the counting of displays of banners or other information, as recited in applicants' dependent claims 55, 57, 80, 81, and 82 and discussed throughout applicants' original disclosure.

The Patent Examiner is requested to reconsider his rejections in light of the amendments and explanations above and to grant an early allowance. If any questions remain to be resolved, the Patent Examiner is requested to contact applicants' attorney at the telephone number listed below.

Respectfully submitted,

Scott B. Allison, Reg. No. 38,370
CHRISMAN, BYNUM & JOHNSON, P.C.
1900 Fifteenth Street
Boulder, Colorado 80302
Tel: (303) 546-1300

Dated: 9/3/99

CERTIFICATE OF MAILING UNDER 37 C.F.R. § 1.8

I hereby certify that the attached AMENDMENT UNDER 37 C.F.R. § 1.111 is being deposited with the United States Postal Service, first class postage prepaid, in an envelope addressed to Assistant Commissioner for Patents, Washington, DC 20231, on this 3rd day of September, 1999.

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

APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
08/858,650	05/19/97	GRIFFITHS	M 18022-001

EXAMINER	
DINH, D	
ART UNIT	**PAPER NUMBER**
2757	18

LM02/1227

SCOTT B. ALLISON
CHRISMAN BYNUM AND JOHNSON
1900 FIFTEENTH STREET
BOULDER CO 80302

DATE MAILED: 12/27/99

This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

OFFICE ACTION SUMMARY

☑ Responsive to communication(s) filed on 9-7-99

☐ This action is **FINAL.**

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

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☑ Claim(s) 1 - 82 is/are pending in the application.

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

☐ Claim(s) _____ is/are allowed.

☑ Claim(s) 1, 3-12, 14-25, 27-41, 43-82 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

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

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

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

Priority under 35 U.S.C. § 119

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

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____.

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

Attachment(s)

☒ Notice of Reference Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

Dung C. Dinh
Primary Examiner

– SEE OFFICE ACTION ON THE FOLLOWING PAGES –

PTOL-326 (Rev. 10/95)

★ U.S. GPO: 1998-409-290/40029

DETAILED ACTION

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-82 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the general concept of not caching the first request signal, does not reasonably provide enablement for the new limitation "signal **cannot** be blocked …", "signal **cannot** be prevented from being received …", "signal is **not blockable** …", etc. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

The specification discloses that it is preferred that the first request signal is not blocked by the caching process. There is no teaching of how one can implement the system such that the signal is **not blockable** or **cannot** be blocked as claimed. There are many ways, both legitimate and illegitimate

means, to block a request signal from reaching a server over a communication network. A system can be programmed to bypass the cache and/or to always send a certain type of request directly to the intended server; but no system can guarantee that a signal cannot be blocked from reaching the server.

The following claim number 1 from U.S. Patent No. 5,948,061 is suggested to applicant under 35 U.S.C. 135(a) for the purposes of an interference:

A network comprising:
a user node having a browser program coupled to said network, said user node providing requests for information on said network;
a content provider affiliate node having a respective affiliate web site responsive to requests for information from said user node to provide media content, advertising space for display of advertising content and a link message to said user node;
an advertiser node having an advertiser web site including advertising content, said advertiser node responsive to a request to provide said advertising content; and
an advertisement server node responsive to a request from said user node based on said link message to select an advertiser node as a selected advertiser node, and identify said advertiser node as said selected advertiser node to said user node,
whereby said advertising content from said selected advertiser node is displayed at said user node.

The suggested claim must be copied exactly, although other claims may be proposed under 37 CFR 1.605(a).

Applicant is given ONE MONTH or THIRTY DAYS, whichever is longer, from the mailing date of this communication to copy this patent claim. Failure to do so will be considered a concession that the subject matter of this claim is the prior invention of

another under 35 U.S.C. 102(g), and thus also prior art under 35 U.S.C. 103(a) (In re Oguie, 517 F.2d 1382, 186 USPQ 227 (CCPA 1975)), but will not result in the abandonment of this application. THE PROVISIONS OF 37 CFR 1.136 DO NOT APPLY TO THE TIME SPECIFIED IN THIS ACTION.

Applicant need not respond to the remaining issues in this action if a suggested claim is copied for the purpose of an interference within the time limit specified above (37 CFR 1.605(b)).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dung Dinh whose telephone number is (703) 305-9655. The examiner can normally be reached on Monday-Thursday from 7:00 AM - 4:30 PM. The examiner can also be reached on alternate Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenton Burgess can be reached at (703) 305-4792.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-9600.

Any response to this action should be mailed to:
Commissioner of Patents and Trademarks
Washington, DC 20231
or faxed to:
(703) 308-9051, (for formal communications intended for entry)
(703) 305-9731 (for informal or draft communications, please label "PROPOSED" or "DRAFT")
Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington. VA, Sixth Floor (Receptionist).

Dung C. Dinh
Primary Examiner

FORM PTO-892	U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	SERIAL NO.	GROUP ART UNIT	ATTACHMENT TO PAPER NO.
NOTICE OF REFERENCES CITED		08/858,650	2153 ~~2767~~	12
		APPLICANT(S)	Griffiths et al.	

U.S. PATENT DOCUMENTS

*		DOCUMENT NO.	DATE	NAME	CLASS	SUB-CLASS	FILING DATE
	A	5,948,061	09/07/1999	Merriman et al.	709	219	10/29/1996
	B						
	C						
	D						
	E						
	F						
	G						
	H						
	I						
	J						
	K						

FOREIGN PATENT DOCUMENTS

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

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

	R	
	S	
	T	
	U	

EXAMINER	DATE	
D. Dinh	December 20, 1999	Form892ccs2106b

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

OIPE JUL 03 2000 PATENT & TRADEMARK OFFICE TC 2600

#2757

AMENDMENT TRANSMITTAL LETTER, Under Small Entity Status			Attorney Docket No: 18022.001 413 SSK 7-10-00
Application Serial Number: 08/858,650	Filing Date: 19 May 1997	Examiner: Dinh, D.	Group Art Unit: 2757

Invention: INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMATION BEING DELIVERED

TO THE COMMISSIONER OF PATENTS AND TRADEMARKS:
Transmitted herewith is an amendment in the above-identified application. The fee has been calculated as shown below.

CLAIMS AS AMENDED

	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	NO. OF EXTRA CLAIMS PRESENT	RATE	ADDITIONAL FEE
TOTAL CLAIMS	78	MINUS	82	0	$9	$0
INDEP. CLAIMS	9	MINUS	9	0	$39	$0

X Petition is hereby made under 37 CFR 1.136(a) to extend the time for response to the Office Action of 12/27/1999 to and through 6/27/2000, comprising an extension of the shortened statutory period of:

___ one month ($55) X three months ($435)
___ two months ($190) ___ four months ($680)

TOTAL ADDITIONAL FEE FOR THIS AMENDMENT	$435

X Small entity status of this application under 37 CFR 1.9 and 1.27 has been established by a verified statement previously submitted.

___ A verified statement to establish small entity status under 37 CFR 1.9 and 1.27 is enclosed.

X A check in the amount of $435 is attached.

___ Charge $_____ to Deposit Account _____.

___ No additional fee is required.

27 June 2000
Date

Daniel N. Fishman
Reg. No. 35512

RECEIVED JUL 07 2000 TECH CENTER 2600

I hereby certify that this correspondence and all correspondence identified as accompanying this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231 on 27 June 2000.

Daniel N. Fishman

Reg. No. 35512

07/05/2000 MPRASAD 00000106 08858650
01 FC:217 435.00 OP

#14/B SSH 7-10-00

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Michael J. Griffiths James D. McElhiney	)
Serial No.:	08/858,650	)
Filing Date:	May 19, 1997	) Group Art Unit: 2757
Title:	Information Storage and Delivery Over a Computer Network Using Centralized Intelligence To Monitor and Control the Information Being Delivered	) Examiner: Dung Dinh
Our File No.:	18022-001	)

AMENDMENT UNDER 37 C.F.R. § 1.111

To: Box Fee Amendment
Honorable Commissioner of
Patents and Trademarks
Washington, D.C. 20231

Dear Sir:

In response to the Patent Examiner's Office Action, Paper No. 12, dated 27 December 1999, please amend the above-identified patent application, as follows:

In the Claims:

1. (Twice Amended) A method for storing information on a primary server and one or more secondary servers and on computer sites connected to a computer network, wherein information delivered over the computer network to a terminal or a group of terminals may contain references to other information to be delivered to the terminal, comprising:

serving a first portion of information to a terminal, wherein said first portion of information contains a reference to a second portion of information;

causing a first request signal to be transmitted from the terminal to a primary server requesting a location address for said second portion of information from which said second portion of information can be served to the terminal, wherein said first request signal [cannot be blocked] includes information intended to prevent said first request signal from being blocked from reaching said primary server by either the terminal or any intermediary device located topologically between the terminal and the primary server as a result of previous caching of said first portion of information or said second portion of information in the terminal or said intermediary device;

sending a location signal from the primary server to the terminal providing said location address of said second portion of information;

causing a second request signal to be transmitted from the terminal containing said location address of said second portion of information and requesting said second portion of information be served to the terminal; and

serving said second portion of information to the terminal.

~~16.~~ 20. (Twice Amended) A method for distributing a banner over a computer network to a device when the banner is referenced or linked to in a document served to the device, wherein the banner is stored in one or more servers, comprising:

receiving a first banner request signal from a device at a first server requesting that a banner be served to the device, wherein said first banner request signal [cannot be blocked] includes information intended to prevent said first banner request signal from being blocked from reaching said first server by the device despite previous caching of

said specified banner in the device;

sending a banner location signal from said first server to the device, wherein said banner location signal includes location information for a specified banner stored on a second server; and

receiving a second banner request signal from the device at said second server requesting that the second server serve said specified banner to the device.

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~~21~~. (Twice Amended) A method for enabling a web page and an associated banner to be served to a computer, wherein the web page contains a link or other reference to the banner, comprising:

serving a web page to a computer;

causing a banner request signal to be sent from the computer to a primary server requesting a banner be served to the computer, wherein said banner request signal includes a Uniform Resource Locator address for said primary server and wherein said banner request signal [cannot be blocked] includes information intended to prevent said banner request signal from being blocked from being received by the primary server as a result of previous caching of the banner on the computer;

determining which specified banner will be served to the computer; and

sending a banner location signal from said primary server to the computer, wherein said banner location signal includes the Uniform Resource Locator address for a device on which the specific banner to be served to the computer is stored.

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~~36.~~ (Twice Amended) A method for distributing a banner over a computer network to a device when the banner is referenced or linked to in a hypertext document served to the device, wherein the banner is stored in one or more servers, comprising:

receiving a first banner request signal from the device at a first server requesting that a banner be served to the device, wherein said first banner request signal [cannot be blocked] includes information intended to prevent said first banner request signal from being blocked by the device or an intermediary server located between the device and said first server as a result of a previous storage in the device or said intermediary server of a response to said first banner request signal sent from said first server to the device;

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determining if said first server is best suited to serve said banner to the device and serving said banner to the device if said first server is best suited to serve said banner and, if said first server is not best suited to server said banner to the device, sending a banner location signal from said first server to the device, wherein said banner location signal includes location information for a specified banner stored on a second server;

receiving a second banner location request signal from the device at said second server requesting that said second server serve said specified banner to said device if said first server is not best suited to server said banner to the device; and

serving said specified banner to said device from said second server if said first server is not best suited to server said banner to the device.

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~~37.~~ (Twice Amended) A method for enabling distribution of a banner over a computer network to a device when the banner is referenced in a document served to the device,

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wherein the banner is stored in one or more servers connected to the computer network, and the device is connected to the computer network via an intermediary server, comprising:

causing a first banner request signal to be transmitted from the device to a first server requesting that a banner be served to the device, wherein said first banner request signal [is not] includes information intended to make said first banner request signal not blockable by the device or the intermediary server as a result of a storage in the device or the intermediary server of said requested banner prior to the generation of said first banner signal by the device;

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sending a banner location signal from said first server to the device, wherein said banner location signal includes location information for said requested banner stored on a second server; and

determining if said requested banner is stored on the device and, if said requested banner is not stored on the device, then causing a second banner request signal to be transmitted from the device to the intermediary server and determining if said requested banner is stored on the intermediary server, wherein if said requested banner is not stored on the intermediary server, causing at least a portion of said second banner request signal to be sent to said second server requesting that said second server serve said requested banner to said device.

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~~43~~. (Amended) A method for serving a banner to a client device, comprising:

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receiving at a primary server a first request for a banner, said first request containing at least a portion of an initial URL, wherein said first request [cannot be

prevented from being received by] includes information intended to prevent said first request from being blocked from the primary server despite previous storage of the banner on the client device;

sending a signal from the primary server to the client device that includes at least a portion of a second URL associated with the banner's location;

receiving at the primary server a second TCP/IP compliant request requesting that the banner be served to the client device if the banner is not stored on the client device;

serving the banner to the client device; and

counting at least one display of the banner on the client device.

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~~48~~. (Amended) A method for enabling accurate counting of displays of a banner on a client device, comprising:

receiving a first banner request signal at a first server requesting that a banner be served to a client device, wherein said first banner request [cannot be prevented from being received by] includes information intended to prevent said first banner request signal from being blocked from said first server, even though there has been previous caching or storing of said banner by the client device or an intermediary device;

sending a banner location signal to the client device, wherein said banner location signal includes location information for a specified banner stored on a second server; and

causing a determination of whether said specified banner is stored on the client device and, if said specified banner is not stored on the client device, receiving a second banner request signal from the client device at said intermediary device and causing a

determination of whether said specified banner is stored on said intermediary device, wherein if said specified banner is not stored on said intermediary device, receiving a third banner request signal at said second server requesting that said second server serve said specified banner to the client device.

~~56~~ 72. (Amended) A method for serving a banner to a client device, comprising:

receiving at a primary server a first request signal for a banner, said first request signal containing at least a portion of an initial URL, wherein said first request signal [cannot be prevented from being received by] includes information intended to prevent said first request signal from being blocked from the primary server as a result of previous caching of the banner in the client device;

sending a signal from the primary server to the client device that includes a second URL associated with the banner's location;

receiving a second request signal requesting that the banner be served to the client device if the banner is not stored on the client device; and

serving the banner to the client device.

~~76~~ 75. (Amended) A method for enabling a banner to be received at a client device, comprising:

generating at the client device a first request signal for a banner;

transmitting said first request signal to a server, wherein said first request signal [cannot be prevented from being received by] includes information intended to prevent

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said first request signal from being blocked from the server as a result of previous caching of the banner on the client device;

receiving at the client device a response signal from the server that includes a URL associated with the banner's location; and

transmitting a second request signal from the client device requesting that the banner be served to the client device.

REMARKS

In the Office Action, Paper No. 12, dated 27 December 1999, the Patent Examiner rejected all pending claims under 35 U.S.C. § 112, first paragraph as not enabling. The Patent Examiner also suggested to the Applicants under 35 U.S.C. § 135(a) that claim 1 from United States Patent Number 5,948,061 be copied for purposes of an interference.

Applicants traverse the rejection of all claims as not enabled. Applicants further traverse the Examiner's suggestion to copy claim 1 of the identified patent for purposes of an interference.

Applicants have amended independent claims 1, 16, 27, 36-37, 43, 48, 56 and 76 in response to the Examiner's § 112 rejection in hopes of advancing the prosecution of this patent application.

§112 Rejection

The Examiner rejected all remaining claims 1, 3-12, 14-25, 27-41 and 43-82 under 35 U.S.C. § 112, first paragraph as not enabling. The Examiner suggests that although the specification enables the general concept of not caching the first request it does not enable the claimed feature wherein the signal ***cannot*** be blocked. The Examiner suggests that although the specification teaches that it is preferred that the signal not be blocked there is no teaching to implement a system such that the signal is ***not blockable*** or ***cannot*** be blocked as claimed. The Examiner notes that there are many legitimate and illegitimate means to block a request from reaching an intended server and that no system can guarantee that a signal ***cannot be blocked*** in view of all such means.

Applicants heartily disagree with the Examiner's suggestion that the specification fails to enable the claimed feature wherein the signal cannot be blocked. The specification starting at page 34, line 1 through page 37, line 4 teaches a multitude of techniques for assuring that the request signal will not be blocked from the intended server. The specified techniques include:

- Use of HTTP standard temporary redirect
- Use of HTTP standard response tags in the server responses including:
  - Expiry tag to specify a latest valid date of the response
  - Last-modified tag to specify the valid date of the response
  - Cache-control tags to indicate that the response is not cachable
  - pragma:no-cache tags to indicate that the response is not cachable
- Use of variable components in the links used by the terminal to request a response such as:
  - a random number
  - a time/date stamp
  - a cgi-bin string
  - a random page identifier
- Use of a URL link that, though constant, appears to the terminal and intermediate servers to be constantly changing

This extensive (though not exhaustive) list enables one of ordinary skill in the art to practice the invention as claimed such that such request is not blocked by normal HTTP standard compliant terminals or proxy servers (or other intermediate nodes).

The Examiner appears to suggest that since not every unknown, non-standardized

technique for blocking a signal from reaching its intended server is addressed by such a list, the Applicants have not enabled the claimed feature of preventing blocking of the signal. Such theoretical extensions are inappropriate to suggest that the Applicants have not enabled one of ordinary skill in the art to practice the invention. The Applicants extensive list presents a number of equivalent methods to prevent blocking of the request signal by presently known HTTP compatible systems, terminals and browsers. The Examiner merely speculates that other unspecified techniques, including illegitimate techniques, may still be capable of blocking such a message.

In view of the above discussion, Applicants suggest that the rejected claims are in fact enabling for one of ordinary skill in the art to practice the invention as claimed.

However, in hopes of advancing the prosecution of this patent application, Applicants have amended the independent claims to remove the phrasing of concern to the Examiner. In particular, the term "***cannot***" has been removed from all independent claims. Rejected claim 1 for example has been amended to recite that the "first request signal ***includes information intended to prevent said first request signal from being blocked*** from reaching said primary server." The absolute term ***"cannot"***, found not to be enabled by the Examiner, is in essence replaced by language indicating that the signal is structured in a manner ***intended*** not to be blocked by caching operations of the terminal or intermediate servers. Similar amendments have been made to other independent claims of the subject application.

Applicants strongly disagree with the Examiner's rejection of the claims as not enabled but have made these amendments to advance the prosecution of the subject application.

In view of these amendments and the above discussion, Applicants respectfully request

reconsideration and withdrawal of the rejection of all claims under 35 U.S.C. § 112 as not enabled.

Suggested Interference

The Examiner suggested copying of claim 1 of patent 5,948,061 (hereinafter the '061 patent) for purposes of provoking an interference therewith. Applicants declined the Examiner's invitation in view of notable distinctions between the claimed inventions and the lack of support for the claim to be copied by the specification of the subject application. Admittedly the claimed invention of the subject application and that of suggested claim 1 of the '061 patent both relate to Internet advertising but that is the extent of the similarity in the claimed invention. The claimed invention of the subject application and that of suggested claim 2 of the '061 patent are directed to very different subject matter and the specification of the subject application cannot support the suggested claim 1 of the '061 patent.

First and foremost Applicants note that all claims of the subject application are directed to specific ***methods*** of delivering network content to a requesting terminal. By contrast, suggested claim 1 of the '061 patent is directed to an ***apparatus*** -- a particular structure of systems that cooperate to deliver requested network content and advertising. In this sense the subject application and the '061 are directed to fundamentally different inventions.

Further, claim 1 of the '061 patent, though seemingly broad, none the less recites specific structure not found in a reasonable reading of the specification of the subject application. For example, Applicants do not find support in the subject application for the combination of several nodes recited in the suggested claim 1 of '061. Specifically the subject application does not

support a combination of servers/nodes as recited in claim 1 of '061 including at least a user node, a content provider having an affiliate web site, an advertising node having an advertiser web site and an advertisement server node. In this sense as well the subject application and the '061 are directed to different inventions. The specification of the subject patent application cannot therefore support the suggested claim 1 of the '061 patent.

Still further, the claimed invention of the subject application is directed to methods simply not taught or reasonably suggested by the '061 patent. For example, one glaring distinction is the very recitation that is the subject of the Examiner's § 112 rejection discussed above. Namely, the '061 patent does not teach or reasonably suggest that the request cannot be blocked from transmission to the intended server by the requesting terminal or by intermediate nodes. In this sense also, the invention of the subject application is very different than that of suggested claim 1 of the '061 patent.

In view of the above discussion, Applicants strongly assert that the subject application and the '061 patent are ***not*** directed to the same invention. Applicants respectfully request reconsideration and withdrawal of the Examiner's suggestion that claim 1 of the '061 is supportable by the specification of the present invention and therefore be copied in accordance with 35 U.S.C. § 135 to provoke an interference.

Despite Applicants refusal to copy the suggested claim for purposes of an interference and in view of the above discussion, Applicants explicitly deny that the '061 patent is relevant prior art with respect to consideration under 35 U.S.C. §§ 102 and 103. Further, the Examiner has not indicated any reading of the teachings of the '061 patent that suggest it is relevant art with respect to the claims of the subject application. Applicants reserve the right to more

thoroughly discuss the relevance of the '061 patent should the Examiner attempt to apply the '061 patent as a reference under 35 U.S.C. §§ 102 or 103.

Conclusion

The Patent Examiner is requested to reconsider and withdraw his rejection in light of the explanations above. The Examiner is further requested to withdraw his request for copying of a claim pursuant to 35 U.S.C. § 135 in view of Applicants position that the specification of the subject application lacks support for such a claim. If any questions remain to be resolved, the Patent Examiner is requested to contact applicants' attorney at the telephone number listed below.

Respectfully submitted,

Daniel N. Fishman, Reg. No.: 35,512
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Dated: 27 JUN 2000

CERTIFICATE OF MAILING UNDER 37 C.F.R. § 1.8

I hereby certify that the attached AMENDMENT UNDER 37 C.F.R. § 1.111 is being deposited with the United States Postal Service, first class postage prepaid, in an envelope addressed to Assistant Commissioner for Patents, Washington, DC 20231, on this 27th day of June 2000.

Daniel N. Fishman

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/858,650	05/19/97	GRIFFITHS M	18022-001

LM02/1002

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EXAMINER	
DINH, D	
ART UNIT	**PAPER NUMBER**
2757	15

DATE MAILED: 10/02/00

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

Commissioner of Patents and Trademarks

PTO-90C (Rev. 2/95)

1- File Copy

U.S. G.P.O. 2000 ; 465-188/25268

Office Action Summary	Application No.	Applicant(s)	
	08/858,650	GRIFFITHS ET AL.	
	Examiner	Art Unit	
	Dung Dinh	2757	

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

Period for Reply

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

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

Status

1)☒ Responsive to communication(s) filed on *03 July 2000* .

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

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

Disposition of Claims

4)☒ Claim(s) *1,3-12,14-25,27-41 and 43-82* is/are pending in the application.

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

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-12,14-25,27-41 and 43-82* is/are rejected.

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

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

Application Papers

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

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

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

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

Priority under 35 U.S.C. § 119

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

a)☐ All b)☐ Some * c)☐ None of the CERTIFIED copies of the priority documents have been:

1.☐ received.

2.☐ received in Application No. (Series Code / Serial Number) _____ .

3.☐ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

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

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

Attachment(s)

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

DETAILED ACTION

The amendment filed 7-3-00 is effective to overcome the U.S.C. 112 1st pargraph rejection in the prior office action (paper #12).

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

All pending claims are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-49 of U.S. Patent No. 6,014,698. Although the conflicting claims are not identical, they are not patentably distinct from each other because all limitations recited in the claims of the current application are within the limitations of the claims of the patent 6,014,698.

Claim 1 of present application:	Claim 1 of patent 6,014,098
A method for storing information on a primary server and one or more secondary servers and on computer sites connected to a computer network, wherein information delivered over the computer network to a terminal or a group of terminals may contain references to other information to be delivered to the terminal, comprising:	A method for delivering information to a terminal connected to a computer network, wherein information delivered over the computer network from a primary server to the terminal contains references to other information to be delivered to the terminal from the primary server or from one or more other servers connected to the computer network, comprising:
serving a first portion of information to a terminal, wherein said first portion of information contains a reference to a second portion of information; sending a location signal from the primary server to the terminal providing said location address of said second portion of information;	serving a first portion of information to the terminal, wherein said first portion of information contains a reference to a second portion of information;
causing a first request signal to be transmitted from the terminal to a primary server requesting a location address for said second portion of information from which said second portion of information can be served to the terminal, wherein said first request signal [cannot be blocked] includes information intended to prevent said first request signal from being blocked from reaching said primary server by either the terminal or any intermediary device located topologically between the terminal and the primary server as a result of previous caching of said first portion of information or said second portion of information in the terminal or said intermediary device;	sending a first request signal from the terminal to the primary server requesting a location address for said second portion of information from which said second portion of information can be served to the terminal, wherein said first request signal cannot be blocked from reaching said primary server by either the terminal or any intermediary device located topologically between the terminal and the primary server as a result of previous caching or storing of said first portion of information or said second portion of information by the terminal or said intermediary device; sending a location signal from the primary server to the terminal providing said location address of said second portion of information; and
causing a second request signal to be transmitted from the terminal containing said location address of said second portion of information and requesting said second portion of information be served to the terminal; and serving said second portion of information to the terminal.	determining ...sending a second request signal from the terminal containing said location address of said second portion of information and requesting that said second portion of information be served to the terminal ...

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dung Dinh whose telephone number is (703) 305-9655. The examiner can normally be reached on Monday-Thursday from 7:00 AM - 4:30 PM. The examiner can also be reached on alternate Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenton Burgess can be reached at (703) 305-4792.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-9600.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, DC 20231

or faxed to:

(703) 308-9051, (for formal communications intended for entry)

(703) 305-9731 (for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington. VA, Sixth Floor (Receptionist).

Dung Dinh
Primary Examiner
September 20, 2000

Notice of References Cited	Application/Control No. 08/858,650	Applicant(s)/Patent Under Reexamination GRIFFITHS ET AL.	
	Examiner Dung Dinh	Art Unit ~~2757~~ 2153	Page 1 of 1

U.S. PATENT DOCUMENTS

*		DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	DOCUMENT SOURCE ** APS	DOCUMENT SOURCE ** OTHER
☐	A	6,014,698 ✓	Jan. 2000	Griffiths	709	224	☐	☐
☐	B	6,115,742 ✓	Sep. 2000	Franklin et al.	709	224	☐	☐
☐	C	6,038,601 ✓	Mar. 2000	Lambert et al.	709	226	☐	☐
☐	D						☐	☐
☐	E						☐	☐
☐	F						☐	☐
☐	G						☐	☐
☐	H						☐	☐
☐	I						☐	☐
☐	J						☐	☐
☐	K						☐	☐
☐	L						☐	☐
☐	M						☐	☐

FOREIGN PATENT DOCUMENTS

*		DOCUMENT NO.	DATE	COUNTRY	NAME	CLASS	SUBCLASS	DOCUMENT SOURCE ** APS	DOCUMENT SOURCE ** OTHER
☐	N							☐	☐
☐	O							☐	☐
☐	P							☐	☐
☐	Q							☐	☐
☐	R							☐	☐
☐	S							☐	☐
☐	T							☐	☐

NON-PATENT DOCUMENTS

*		DOCUMENT (Including Author, Title Date, Source, and Pertinent Pages)	DOCUMENT SOURCE ** APS	DOCUMENT SOURCE ** OTHER
☐	U	Goldberg et al., "Beyond the Web: Excavating the Real world via Mosaic", Second International WWW Conference, 1994. Source: Internet, retrieved 5/2/96 from http://www.usc.edu/dept/raiders/paper/	☐	☐
☐	V		☐	☐
☐	W		☐	☐
☐	X		☐	☐

*A copy of this reference is not being furnished with this Office action. (See Manual of Patent Examining Procedure, Section 707.05(a).)
**APS encompasses any electronic search i.e. text, image, and Commercial Databases.

Beyond the Web: Excavating the Real World Via Mosaic

THE MERCURY PROJECT.

- Ken Goldberg, Assistant Professor, Computer Science
- Michael Mascha, Assistant Professor, Anthropology and
- Steven Gentner, M.S. Candidate, Computer Science
- Juergen Rossman, Graduate Student, University of Dortmund, Germany
- Nick Rothenberg, PhD Candidate, Visual Anthropology
- Carl Sutter, Senior Programmer/Analyst, Center for Scholarly Technology
- Jeff Wiegley, PhD Candidate, Computer Science

University of Southern California. Los Angeles, CA.

(To appear in the Second International WWW Conference, Chicago, IL, Oct 17-21, 1994.)

Abstract

This paper describes a Mosaic server that allows users to "leave the Web" and interact with the real world. An interdisciplinary team of anthropologists, computer scientists and electrical engineers collaborated on the project, desigining a system which consists of a robot arm fitted with a CCD camera and a pneumatic system. By clicking on an ISMAP control panel image, the operator of the robot directs the camera to move vertically or horizontally in order to obtain a desired position and image. The robot is located over a dry-earth surface allowing users to direct short bursts of compressed air onto the surface using the pneumatic system. Thus robot operators can "excavate" regions within the environment by positioning the arm, delivering a burst of air, and viewing the image of the newly cleared region. This paper describes the system in detail, addressing critical issues such as robot interface, security measures, user authentication, and interface design. We see this project as a feasibility study for a broad range of WWW applications.

Goals of the Project

WWW and Mosaic[1]-like servers provide a multi-media interface that spans all major platforms. Thousands of sites have been set up in the past year. Our goal with this project was to provide public access to a teleoperated robot, thus allowing users to reach beyond the digital boundaries of the WWW.

Such a system should be robust as it must operate 24 hours a day and it should be low in cost (we had an extremely limited budget). It is worth noting that the manufacturing industry uses the same criteria to evaluate robots for production. Thus our experience with RISC robotics (see below) proved helpful.

Our secondary goal was to create an evolving WWW site that would encourage repeat visits by users to collectively solve a puzzle. As of this writing we do not have sufficient data to report on the success of the "puzzle" component; therefore this paper focuses on the details of the implementation. We also speculate on how Mosaic might be used for other tele-operated applications.

Related Work

The first "teleoperated robots" were developed over 30 years ago. The basic objective has always been to develop systems capable of working in inhospitable environments (such as radiation sites). Teleoperation began with very simple mock-ups in nuclear power plants [Mos], progressing to more versatile setups for teleoperation of robots in space [Miz]. Over the last 20 years, the development of intuitively operable teleoperation tools has continued to play an important role in the development of robotics in general. The basic objectives have remained the same, even though the methods and technical limitations have changed.

Today, sophisticated "Telerobot Operator Control Stations" [Kan] are equipped with stereoimage-displays, "force reflecting hand controllers" and comprehensive video graphics support. The development of teleoperation stations is currently being pushed further with the help of latest graphics workstations to provide so-called "telepresence." Modern telepresence systems, considered to be pushing the frontier of research in this field, are defined as follows [Aki]: "At the worksite, the manipulator has the dexterity to allow the operator to perform normal human functions. At the control station, the operator receives sufficient quantity and quality of sensory feedback to provide a feeling of actual presence at theworksite."

The Mercury Project does not achieve this level of telepresence but provides a limited level of teleoperation. One of our goals was to provide "teleoperation for the masses." Instead of developing a highly sophisticated, multi-million-dollar testbed, we opted for a simple and reliable end-effector on a commercial robot. Combined with an intuitively operable man-machine-interface, the system gives all WWW users access to teleoperation.

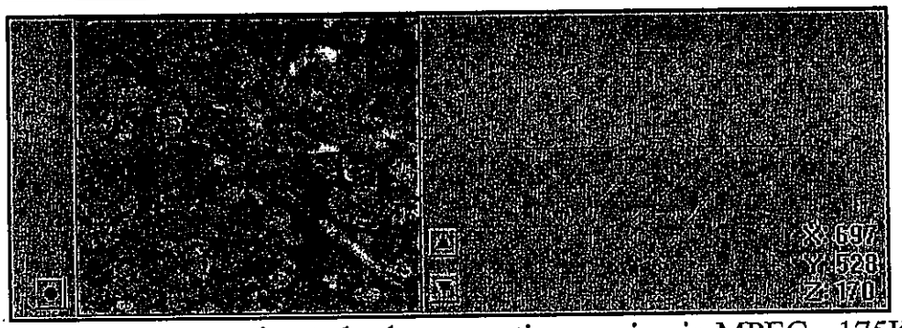
In the Discussion section, we describe a number of other WWW sites that offer interactive capabilities.

User Interface and Environment Design

The interface design for the system was challenging due to the limitations of the HTML/HTTP environment, as well as network traffic considerations. An effective system was created within such limitations by carefully designing the physical environment for the robot, and by fine-tuning the user-machine interface. For example, the initial idea of a live video feed from the camera was dropped in order to maintain compatibility with all visual clients on the Web. (Although we could have implemented some custom clients [2], we decided to stay within the limits of HTML/HTTP to reach as large a user base as possible, making this a truly global system.) In addition, initial simulations using a robot fitted with grippers (simulated in VIRTUS WALKTHROUGH) revealed a high degree of complexity in control functions [3], not suitable for the anticipated 5-10 seconds per frame page loading time, a 2D Mosaic window and a naive/untrained user.

The team chose instead to use a simple environment which would allow relatively easy control of the robot. Here the analogy taken from real world archaeology - using a dry-earth environment and compressed air bursts - allowed us to simplify the robot control dramatically. Thus users could be quickly trained in the operation of the system, through a simple "OperatorÕs Orientation" and a "Level 1 Clearance Test."

Even with a simplified system, users are still able to choose between fine and gross movements of the arm. Fine pitch movements are executed by clicking in the camera image, with the robot moving to center the arm over the X,Y coordinates of the click-point. Crude navigation is provided by clicking on a schematic picture of the robot and it's workspace, with the robot moving to center the arm over the click-point. Two buttons allow navigation in the Z axis (between "up" and "down" positions), with a button to blow air only active when at the Z=O (i.e., "down") position.



(Click to see an animated robot operation session in MPEG - 175K)

Other features of the system were designed to balance functionality with user needs. All HTML documents sent to the clients are carefully designed to minimize network traffic in order to get a high refresh rate. For example, control panel functions are clearly distinguished from text-based information documents. The ÒOperator's LogÓ was

implemented to create a forum for collaborative efforts to solve the puzzle/problem regarding the underlying logic which links the artifacts. (The ÒOperator's LogÓ is readable throughout the system but only writeable after completing an operating session.) A second entry path was also created to the system, which provides a "back-story" explaining the project while also hinting at possible "real world" uses of the system.

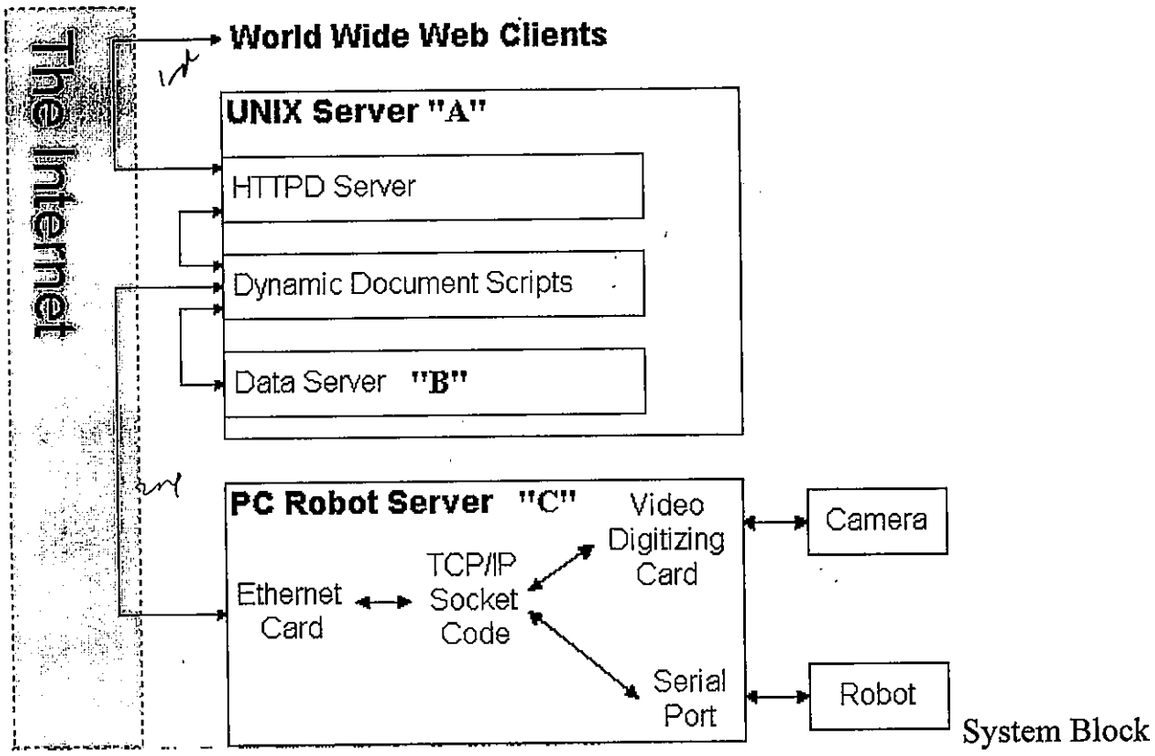
Access to the Robot

Most of the HTML documents seen by the user on our site are generated by a script running on the WWW server. Using a random token scheme described below, the system tracks each user as he or she proceeds through the interface and generates appropriate HTML documents. This allows the system to discriminate between "observers" and "operators" so that it presents only accessible options to each.

To operate the robot, the user must read the information on how to use the control panel, and then complete a level-1 clearance test to get a password. Since only one person can operate the robot at a time, the system maintains a queue of pending operators. A typical user will enter his/her password, and then add him/herself to the queue. Each time update button is clicked, the system updates the queue and returns a current status page. When the user's turn arrives, the screen returned is the live operators' control screen.

System Architecture

Below is a Block Diagram for the system. We start with an overview that necessarily glosses over many interesting details.



System Block Diagram

At one end are WWW clients from around the world; at the other end is a robot arm combined with a camera. The robot and camera provide an updated image of the environment, which is combined with a schematic of the robot arm/workspace and control buttons to produce the final GIF image that is send to users.

At any given time there may be dozens of clients interacting with the system. Since there can only be one Operator at a time, one challenge is to keep track of which client is the operator.

The Mercury system is comprised of three communicating servers. The first, call it A, is a standard Mosaic server (NCSA httpd v.1.3, currently running on a Sun SPARCserver 1000, with SunOS Release 5.3. When the RTE Site is requested by an observer, the most recent image, which is stored on server A, is simply returned.

The database of registered users is handled by another server, call it B. In our case, Server B runs on the same machine as server A. The database server is custom programmed for this project, but performs fairly standard database functions.

When a client request comes in, Server A communicates with server B. If that client is an Operator, Server A must then communicate with a third server, call it C, that controls the robot. Server C runs on a Pentium-based PC and communicates with servers A and B via

the Internet. Server A decodes the ISMAP X&Y mouse coordinates, and sends them to server C.

On server C, a custom program decodes these coordinates into a robot command and verifies that the command is legal, e.g., within the robot workspace. If it is, this command is then converted into a robot command format which is sent to the robot over a serial line. Once the robot move is completed server C uses the CCD camera to capture a stable 8 bit 192x165 image of the workspace.

Using a simple set of equations for inverse kinematics server C then generates a schematic view of the robot in its new configuration. This schematic is combined with the camera image, and the up, down, and air control buttons to form a new composite image. Server C then compresses this image into GIF format and returns it to Server A, which updates the most recent image and returns it to the Operator client.

Subsystems

Random Tokens for Cache Avoidance and User Tracking

Following some complex and unwieldy tests, we implemented a random token scheme for tracking users as they use the system. Each time a URL is returned, a large random number is added to the path (which the NCSA HTTPD 1.3 server splits into the PATH_INFO environment variable). This "token" serves two purposes:

The first is to prevent the WWW client from caching the robot view. When a document is requested a second time during a session, it is much faster to swap in a local copy of the document rather than going back over the net to retrieve it a second time. Most implementations of Mosaic support such caching at various memory levels. However in our case we want to repeatedly retrieve the URL containing the robot image because it is updated continuously. In brief, we DON'T WANT users to cache this url. The random token makes each request look different and tricks the client into retrieving a fresh version of the document.

The second use for the token is to identify Operators. When an operator logs in with a correct password, the system begins tracking him/her as he/she moves from viewing the robot to being on the operators' queue to operating the robot. Since the same script is used for all views, the token allows the system to customize the result for every user depending on his/her position in the system.

Scripts

The robot view screen is controlled for the most part by one script at the HTTPD server.

Each call to the main script has a token attached to the URL. The token is decoded by the WWW server, and placed in the PATH_INFO environment variable. The main script then checks the token with the database server to determine the status of the user. Each check of the database generates a system update to keep the queue moving. The user's status is used to generate the custom system status page.

The robot image itself is only changed by the operator when he or she makes a move. Each image is date and time stamped, so WWW clients that cache the image will only retrieve the image when it changes (since its filename will be different, due to a different time stamp).

Due to the client-server architecture of the World Wide Web HTTPD protocol, The robot system (server) has no way to contact the client except at the client's prompting. From the user's point of view, once he or she gets the robot view screen, there is no way for the server to keep sending updates automatically as the robot is moved by the operator. The screen updates must be driven by the user. Since the user must trigger each update, we wanted to provide a button for doing so, since each web client handles reloading the page differently. Some sites have a "reload" hypertext link to the same page, but this doesn't work for any client that caches pages. If a page is being viewed, hitting reload will just re-display the page from the cache, thus not obtaining a new view from the system. Asking the user to disable his/her cache is also problematic, since not all clients allow this option.

One attempt was made to use a mini-form, since the submit button always calls a script and is not cached. that scheme was eventually dropped, since passing registered user identification information to the server via hidden fields only worked on some clients. Using the random token allows for an elegant interface.

Since the robot can only be controlled by one person at a time, a registration scheme was implemented to allow the server to track operators as they move on to the waiting queue and progress to controlling the robot. Since the server only knows the IP address of each user, some user information had to be incorporated into the HTML robot view document itself for re-transmission to the system when the user hits "reload." There are various techniques used by many sophisticated web systems to accomplish user identification between document requests, but we found some problems in many of the standard solutions. In the end, the random token served excellently as a means of identifying registered users.

A preliminary attempt was made to use a small form to identify the user. Hidden fields could hold the user id, but once again, many clients do not implement the hidden field attributes so the interface is cluttered by unnecessary fields. Putting the user's id information into the ACTION field of the form tag is also client dependent. Unfortunately, some clients strip that data before adding the encoded field information.

Since random tokens were already being passed with each update, the system was extended to track the tokens of each registered user. Each time the script is called, the token is exchanged for a new one, and the database is updated with the new token for registered users. One side effect is that the user can not use the client re-load button, since this will not use the new URL (it is embedded in the update HREF).

The Data Server

The data server ("B") is a custom Perl script that handles all of the database work for the project. It continuously runs as a TCP/IP listener, waiting for database transactions from the other system scripts. The data server runs as a single process, handling requests serially to maintain internal data integrity. Typically, transactions are very short, since the data is kept in main memory. The data server could be replaced by an off-the-shelf transaction based DB system in the future. A time-out is set to close the connection if there is too much time elapsed between commands. This was implemented because some WWW clients would crash in the middle of a document request, leaving the system waiting for the connection to be closed.

Internal Network Interface

The networking functionality required by the project was defined by two factors. On one hand, the camera that we purchased required a PC-based platform running an MicroSoft DOS or compatible operating system to run on Server C. On the other hand, the expected load of client requests required a machine capable of more heavy networking duties such as a Sun workstation (Server A). Currently Server A is located across campus from server C.

These servers are connected via Ethernet. Each machine has its own IP address and resides in the usc.edu domain. Communication is achieved using a socket connection between the two machines. The implementation on Server A was done using the standard BSD socket functions provided with the SunOS 4.1 operating system and Perl. On Server C we used a publicly available socket package called Waterloo TCP and Borland C. The Waterloo TCP package was obtained from the ftp site dorm.rutgers.edu in the file /pub/msdos/wattcp/wattcp.zip.

With this software Server A can request a socket connection to Server C to establish a connection. The first step in obtaining a new image is for Server A to write a command consisting of thirty bytes which encodes the (xy) coordinates of the ISMAP event. After Server C completes the moves and generates the new image, it writes the size of the new image to server A so that server A knows exactly how many bytes to expect. Server C then proceeds to write the entire image to the socket and waits for the socket to close to insure deliver of the data. Once server A has read all the specified bytes it closes the

socket. Server C is now ready and waiting for another socket connection. Server A is free to continue processing the Mosaic actions of the current users.

Current throughput is approximately 20 Kbytes/second, which is poor compared to the 0.5 megabyte per second rate that can be achieved between two Sun workstations in close proximity on the campus network. At this time we feel that the delays are being imposed by the MS-DOS operating system because of it's inability to support networking operations and its lack of multitasking abilities, which necessitates busy waiting cycles in the PC software to obtain concurrence between the robotic/camera operations and the networking duties.

Our low data rate is somewhat tolerable because the time for communication between Servers A and C is small compared with Internet delays between clients and server A. One way to speed communication would be to use different methods of image compression such as JPEG to reduce the size of the image. However this may introduce latency due to encoding.

The IBM Robot and Server "C"

The robot we're using is an IBM SR5427 SCARA arm, built around 1980.

SCARA stands for "Selective Compliance Assembly Robot Arm" . Robots with SCARA kinematics are common in industrial assembly for "pick-and-place" operations because they are fast, accurate and have a large 2.5D workspace. However, the SCARA arm can only rotate its gripper about the vertical (Z) axis. We selected this robot over other robots in our lab due to it's excellent durability, large workspace, and because it was gathering dust in the Robot Education Lab.

The IBM SCARA robot is controlled through a 4800 baud serial port by a custom written C library constructed with reference from IBM's BASIC library distributed along with the robot. The commands sent by the library are simple instructions consisting of instruction id, length, data and checksum. The data length and content varies depending on instruction id. The IEEE floating point format is used to represent the necessary data. This command string is then sent over the serial line to the robot to issue the command.

Unfortunately IBM no longer supports this robot and we were forced to read two antiquated BASIC programs and monitor their serial line transmissions to decipher the protocols needed for serial control of the robot. The robot accepts XYZ and Theta commands using IEEE format and checksums. Server C now runs on a Pentium based PC with all custom code written in Borland C.

The first step was implementing a local graphical user interface to control robot movements and monitor subsequent functions such as network flow. We chose two

views of the workspace: a global schematic view for coarse motions, and a local camera view for fine motions. Note that a click on the camera image requires a different relative move if the camera is in the up or down position. To handle it, we implemented an empirical calibration program.

The major difficulty in implementing Server C was to schedule response to the network, the local mouse, and the image capture board. At first we discussed a multi-tasking environment but, upon further study, we realized we could achieve this cooperation within a single DOS task. Another problem, inherent to DOS based applications, is memory management. This complication was solved by careful usage of memory and by utilizing the screen itself as a memory buffer. This careful usage of memory enabled the custom written GIF encoder to use more memory which, combined with an appropriate hash function, sped the GIF encoding process up to a few microseconds.

In future versions of Mercury, we plan to incorporate a more sophisticated PC-based robot simulation system based on COSIMIR [Fre] from the University of Dortmund.

Camera

We are using an EDC 1000 digital CCD camera from Electrim Inc. This camera was chosen based on size and cost. Image data is sent from the camera back through a serial line into a video capture card. The picture captured is always 192 by 165 pixels with 256 shades of gray. The image size and gray shades are fixed. Focus and contrast are manually adjusted. Exposure time can be changed by software to range between 1/200 th to 1/64 th of a second. 1/150th exposure was used to reduced light streaking that the camera is prone to.

Although the robot's control system quickly dampens oscillation about the destination point, dynamic effects can cause image blur. Two solutions were implemented. First the robot was slowed down enough as to reduce some of the vibration but not to hinder the robot access speed considerably. Second, once the robot responds positively to an issued command, the camera captures two pictures each at 1/64 th of a second. These two images are compared to determine a factor of similarity. If this factor is below some set value the image is presumed to be stable, otherwise subsequent pictures are taken until the image pair is determined to be stable. More then 5 trials results in a time-out in which case the most current image is used and the program continues. This image comparison procedure reduces movement streaks seen in pictures of moving objects.

Lighting the workspace has been problematic. The work space is primarily luminated by standard florescent ceiling fixtures and augmented by two additional florescent lamps to reduce shadows and raise the overall ambient light levels. We tested a contrast enhancement routine to normalize the lighting of each image captured from the camera. This increased the visual aesthetics of the image but subjected it to drastic light and dark

changes as the robot moved onto different objects with different light reflecting qualities. In response, a global lighting adjustment was implemented but found to reduce certain areas to unacceptable darkness. Certainly a better lighting system is required.

Due to the manual focus adjustment of the camera, the focus adjustment could not be changed between the up and down position of the camera. This resulted in a compromise focus adjustment that is not perfect for the up or down position of the robot arm, but accepatable in both positions.

To decrease compressed image size and thus increase network transfer rate the image is reduced from 256 to 64 gray scales since most systems available can only display 256 colors or 64 shades of gray. Thus the gray scale reduction did not reduce image quality but reduced compressed image size by about 10K.

Robustness and Soft Resets

All robot motions are monitored by Server C. Each command sent to the robot is verified to be within the robot's workspace. Acknowledgments from the robot are monitored to detect errors. When an error is detected, Server C automatically resets the robot controller, recalibrates, and returns the robot to its previous position.

Performance

History and Statistics

Daily statistics are available and may be correlated with project milestones. As of the writing of this paper, the system has been online for over 4 weeks and there are approximately 100 users per day. There is also a list of all hosts that have visited the system. As of this writing the system has been visted by hosts from all of the major continents except the polar caps.

Refresh Rates via Ethernet

System response time seems to be mostly dependent on network link speeds. Locally, we get screen refreshes at rates of 5-10 seconds per page. Similar response times have been reported from Europe. Obviously, a slow local link or SLIP connection will drastically affect the update speed, since the robot control image is essential to the system. Updates are also strongly affected by the speed of the WWW client application.

Uptime

The system is designed for 24 hour use. The WWW server scripts are generally

modified, tested and then loaded into the running system. Background programs monitor the system and notify the team members if there are problems.

Operators' Logs

When an operator has finished driving, he or she is prompted to make a textual entry into an "Operator's log". The Operator's log provides an ongoing forum for discussion of the system and record of artifacts discovered in the sand.

For example, several skeptics have claimed that the system is an elaborate hoax where all images are taken from a prestored library (much like the celebrated Apollo Moonwalk hoax of 25 years ago). We have had encouraging comments from the robotics community, including several researchers at NASA.

Discussion and Future Applications:

This project is an initial step in an ongoing educational and research project at the University of Southern California. It brings together faculty and students of different backgrounds to collaborate in the design and implementation of a networked system that combines robotics with archaeology and interactive art.

This system exemplifies RISC Robotics, which advocates Reduced Intricacy in Sensing and Control. The SCARA-type robot requires only 4 axes, is relatively inexpensive and robust, and it is easy to avoid singularities. The end effector we've used here is also about the minimum. For more on RISC as applied to industrial robotics, please see RISC for Industrial Robots: Recent Results and Open Problems, (with J. Canny),1994 IEEE Conference on Robotics and Automation.

We see the project leading in several directions. For Mosaic and the WWW, the required interface design prompted new developments related to several issues, including user authentication, user queuing and interface security (as discussed above).

For this project we chose a very simple application. The server can be extended to a variety of platforms that permit remote inspection and manipulation of objects -- for example, providing unique and unedited access and views of priceless and otherwise inaccessible resources (a Grecian urn, a Gutenberg Bible, etc.), thus providing an alternative to pre-stored libraries which are limited in terms of perspective, depth of resolution, etc. (Cite Recent NY Times article on the Metropolitan Museum of Art).

Further extensions for this project might include: the robot could be placed out in the field, in a remote anthropological site or on the moon; the camera could be replaced with a scanning electron microscope; or the remote operator could be a doctor examining a

patient or a specialist performing remote inspection or manufacturing. All of these areas also have significant implications for education, as they present the opportunity for virtual "field trips" to a live site while permitting remote manipulation from the classroom.

Anthropologists have conventionally recorded the diverse cultural heritage of humankind by means of varied media: written text, graphics, film, sound and still images. The advantage of a system like the one described in this paper lies in the fact that you do not have to rely on prerecorded media. It enables the user to view and possibly record her or his own "slice of reality". We see the Web as a perfect medium for updating pre-recorded media as described in [Mas] Interactive Education: Transitioning CD-ROMs to the WEB, a paper presented at the First WWW Conference, Geneva 94. Furthermore, we now have the possibility to combine updateable prerecorded media of all sorts with live recordings and live remote interactions. The possibilites of a system that combines global access to up-datable prerecorded media and combines it with the possibility of live remote interactions are just beginning to unfold, and are a central focus of interest for the anthropologists from the E-LAB involved in this project.

In view of other interactie WWW sites, we propose a three-tiered system describing interactively on the WWW. Under Level I, interaction is solely between digital information stored on computers or created by scripts running on such machines, and connected or communicating with the WWW and Mosaic clients. In Level II sites, the clients are able to observe the "real world" by means of a camera observing and digitizing visual and, hopefully soon, audio-visual information. The camera acts as an "eye" for the Web, providing multiple "real world images" from a global theater. A number of Web sites fall into this category, such as the Coffee Pot and the Fishtank sites. All have the same characteristic of passively observing the real world. We also know of one restricted site that allows the user to alter the user's point of view (see LEGO pan and tilt site.)

The Mercury Project introduces a third level. Level III sites reach beyond the digital domain to allow users to alter a remote physical environment. We envision this project as a first glimpse into the possibilities available at Level III. We might also speculate about other levels, which might allow remote users to control a mobile robot and thus "tele-ambulate".

Footnotes

[1]
To simplify we mention only Mosaic as a WWW client but we are aware of the fact that there are different WWW clients similar to Mosaic, e.g. MacWeb, Cello, etc.

[2]
MBONE broadcasting, REFERENCE to MIT LIVE VIDEO SITE [diversion -

possible fixes to client refresh problem to show we know about the X stuff etc.] There are two possible fixes to this problem, One is to release specially modified clients that set up a two-way communication, the second is to use some other software to display the current system on the user's client workstation. Since many clients are used to view the WWW, making modifications would be difficult, especially since they are being updated all the time. Even if source code could be obtained for every major client, changes would have to made to every release of all these be on each release of these applications, The second possibility is to write a separate program to run on the clients' workstation. The problem here is to write a robots client that can be released for enough platforms to be useful, Since this would be an esoteric piece of the system, it is not likely that other sites would customize the software for different systems like is done for the major systems. One technique is to use the X windows protocol to display a client application on the users workstation running an X server. (weather, movies) We felt that this would be a limited audience, however. It also may compromise security from the user's point of view. Both these approaches may be attempted in version 2.0 of the system to allow more enhanced use of the system for some users. The HTTPD protocol could be extended to allow these sort of connections, though - maybe we need a new protocol for passing media only back that doesn't have all the hooks into system calls like X Windows and Display PostScript.

[3]
3D control of a robot needs: 3 dimensions of spatial movement, 3 dimensions of orientation and 1 to 3 dimensions of gripper control.

Acknowledgments

- Rick Lacy, Mark Brown, and the Center for Scholarly Technology,
- Depts. of CS and Anthro,
- Prof. Peter Danzig (CS)
- The alpha and beta testers
- The Laika Foundation
- The Los Angeles Museum of Miniatures

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#16 (ext. of time ②
T. McBeth-Brown 3/14/01

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

Docket Number (Optional): 18022.001

In re Application of Griffiths et al.

Application Number 08/858,650 | Filed 19 May 1997

For INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMATION BEING DELIVERED

Group Art Unit 2757 | Examiner Dinh, D.

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

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

- ☐ One month (37 CFR 1.17(a)(1)) $ 110.00
- ☒ Two months (37 CFR 1.17(a)(2)) $ 390.00
- ☐ Three months (37 CFR 1.17(a)(3)) $ 890.00
- ☐ Four months (37 CFR 1.17(a)(4)) $1,390.00
- ☐ Five months (37 CFR 1.17(a)(5)) $1,890.00

☒ Applicant claims small entity status. See 37 CFR 1.27. Therefore the fee amount shown above is reduced by one-half, and the resulting fee is: $ 195 .

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

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

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

☐ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number _____. I have enclosed a duplicate copy of this sheet.

I am the ☐ applicant/inventor

☐ assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).

☒ attorney or agent of record.

☐ attorney or agent under 37 CFR 1.34(a). Registration number if acting under 37 CFR 1.34(a). _____.

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1 March 2001
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NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

☐ Total of _____ forms are submitted.

Burden Hour Statement: This form is estimated to take 0.1 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

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#17 Terminal Disclaimer
TMC Board ... 3/14/01

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PTO/SB/26 (10-00)
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TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A PRIOR PATENT	Docket Number (Optional) 18022.001

In re Application of: Griffiths, et al.

Application No.: 08/858,650

Filed: 19 May 1997

For: INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMATION BEING DELIVERED

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The owner*, Matchlogic, Inc., of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application, which would extend beyond the expiration date of the full statutory term defined in 35 U.S.C. 154 to 156 and 173, as presently shortened by any terminal disclaimer, of prior Patent No. 6,014,698. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

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Check either box 1 or 2 below, if appropriate.

1. ☐ For submissions on behalf of an organization (e.g., corporation, partnership, university, government agency, etc.), the undersigned is empowered to act on behalf of the organization.

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

2. ☒ The undersigned is an attorney or agent of record.

[signature] — Signature | 1 March 2001 — Date

Daniel N. Fishman
Typed or printed name

☒ Terminal disclaimer fee under 37 CFR 1.20(d) included.

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*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/96 may be used for making this statement. See MPEP § 324.

MNGUYEN1 00000012 08858650

55.00 OP

Notice of Allowability	Application No. 08/858,650	Applicant(s) GRIFFITHS ET AL.	
	Examiner Dung Dinh	Art Unit 2153	

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

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance and Issue Fee Due or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *terminal disclaimer filed 3/5/01*.
2. ☒ The allowed claim(s) is/are *1,3-12,14-25,27-41 and 43-82*.
3. ☐ The drawings filed on _____ are acceptable as formal drawings.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.
5. ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE FOR SUBMITTING NEW FORMAL DRAWINGS , OR A SUBSTITUTE OATH OR DECLARATION. This three-month period for complying with the REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL is extendable under 37 CFR 1.136(a).**

6. ☐ Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient. A SUBSTITUTE OATH OR DECLARATION IS REQUIRED.

7. ☒ Applicant MUST submit NEW FORMAL DRAWINGS
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review(PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No. ____.
   (b) ☐ including changes required by the proposed drawing correction filed _____, which has been approved by the examiner.
   (c) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No. _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

8. ☐ Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Any reply to this letter should include, in the upper right hand corner, the APPLICATION NUMBER (SERIES CODE / SERIAL NUMBER). If applicant has received a Notice of Allowance and Issue Fee Due, the ISSUE BATCH NUMBER and DATE of the NOTICE OF ALLOWANCE should also be included.

Attachment(s)

1☐ Notice of References Cited (PTO-892)
2☐ Notice of Informal Patent Application (PTO-152)
3☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
4☐ Interview Summary (PTO-413), Paper No.____ .
5☐ Information Disclosure Statements (PTO-1449), Paper No. ____.
6☐ Examiner's Amendment/Comment
7☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
8☐ Examiner's Statement of Reasons for Allowance
9☐ Other

Dung Dinh
Primary Examiner
Art Unit: 2153

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NOTICE OF ALLOWANCE AND ISSUE FEE DUE

TM02/0406

SCOTT B ALLISON
CHRISMAN BYNUM AND JOHNSON
1900 FIFTEENTH STREET
BOULDER CO 80302

APPLICATION NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT		DATE MAILED
08/858,650	05/19/97	070	DINH, D	2153	04/06/01
First Named Applicant	GRIFFITHS,		35 USC 154(b) term ext. =	0 Days.	

TITLE OF INVENTION: INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMATION BEING DELIVERED

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
0 18022-001	709-229.000	E59	UTILITY	YES	$620.00	07/06/01

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED.

THE ISSUE FEE MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED.

HOW TO RESPOND TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.
If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

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B. If the status is the same, pay the FEE DUE shown above.

If the SMALL ENTITY is shown as NO:

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B. File verified statement of Small Entity Status before, or with, payment of 1/2 the FEE DUE shown above.

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Applicants:	Michael J. Griffiths James D. McElhiney	
Serial No.:	08/858,650	
Filing Date:	May 19, 1997	Group Art Unit: 2153
Title:	Information Storage and Delivery Over a Computer Network Using Centralized Intelligence To Monitor and Control the Information Being Delivered	Examiner: Dung Dinh Our File:18022-001

TRANSMITTAL OF ISSUE FEE

To: Box ISSUE FEE
c/o Technology Center 2100
U.S. Patent and Trademark Office
Washington, DC 20231

Enclosed is Chrisman, Bynum & Johnson check no. 86452 in the amount of $1,270.00 ($1,240.00 for Issue Fee and $30.00 for advance order of patent copies), along with the Issue Fee Transmittal form PTOL-85B (Rev. 10-96) for the above-referenced patent application. Please note that the applicant is no longer entitled to a small entity status. Therefore, the Issue Fee Transmittal form, PTOL-85B (REV.) 10-66), has been corrected to reflect the large entity status along with the appropriate fee.

Dated: June 29, 2001

Respectfully submitted,

James R. Young, Reg. No. 27,847
CHRISMAN, BYNUM & JOHNSON
1900 Fifteenth Street
Boulder, Colorado 80302
Telephone: (303) 546-1300

#19 8-18-01

PART B—ISSUE FEE TRANSMITTAL

Complete and mail this form, together with applicable fees, to: **Box ISSUE FEE**
Assistant Commissioner for Patents
Washington, D.C. 20231

OIPE JUL 05 2001

MAILING INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE. Blocks 1 through 4 should be completed where appropriate. All further correspondence including the Issue Fee Receipt, the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

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

TM02/0406

~~SCOTT B ALLISON~~ James R. Young
CHRISMAN BYNUM AND JOHNSON
1900 FIFTEENTH STREET
BOULDER CO 80302

Note: The certificate of mailing below can only be used for domestic mailings of the Issue Fee Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing.

Certificate of Mailing

I hereby certify that this Issue Fee Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Box Issue Fee address above on the date indicated below.

James R. Young (Depositor's name)
[signature] (Signature)
29 June 2001 (Date)

APPLICATION NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT		DATE MAILED
08/858,650	05/19/97	078	DINH, D	2153	04/06/01

First Named Applicant: GRIFFITHS, 35 USC 154(b) term ext. = 0 Days.

TITLE OF INVENTION: INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMATION BEING DELIVERED

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
0 18022-001	709-229.000	E59	UTILITY	NO ~~YES~~	$1,240.00 ~~$620.00~~	07/06/01

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363). Use of PTO form(s) and Customer Number are recommended, but not required.

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" indication form PTO/SB/47) attached.

2. For printing on the patent front page, list (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 James R. Young
2 Chrisman Bynum & Johnson
3 ______

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)
PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. Inclusion of assignee data is only appropiate when an assignment has been previously submitted to the PTO or is being submitted under separate cover. Completion of this form is NOT a subsititue for filing an assignment.

(A) NAME OF ASSIGNEE Matchlogic, Inc.

(B) RESIDENCE: (CITY & STATE OR COUNTRY) Lousiville, CO

Please check the appropriate assignee category indicated below (will not be printed on the patent)
☐ individual ☒ corporation or other private group entity ☐ government

4a. The following fees are enclosed (make check payable to Commissioner of Patents and Trademarks):
☒ Issue Fee
☒ Advance Order - # of Copies 10

4b. The following fees or deficiency in these fees should be charged to:
DEPOSIT ACCOUNT NUMBER 031725
(ENCLOSE AN EXTRA COPY OF THIS FORM)
☒ Issue Fee
☒ Advance Order - # of Copies 10

The COMMISSIONER OF PATENTS AND TRADEMARKS IS requested to apply the Issue Fee to the application identified above.

(Authorized Signature) [signature] (Date) 6/29/01

NOTE: The Issue Fee will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the Patent and Trademark Office.

07/09/2001 [illegible] 00000159 08858650
01 FC:142 1240.00 OP
02 FC:561 30.00 OP

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending on the needs of the individual case. Any comments on the amount of time required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, D.C. 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND FEES AND THIS FORM TO: Box Issue Fee, Assistant Commissioner for Patents, Washington D.C. 20231

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TRANSMIT THIS FORM WITH FEE

PTOL-85B (REV.10-96) Approved for use through 06/30/99. OMB 0651-0033 **Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE**

CERTIFICATE OF MAILING UNDER 37 C.F.R. 1.8
I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Box ISSUE FEE, c/o Technology Center 2100, US Patent and Trademark Office, Washington, DC 20231 on
June 29, 2001
James R. Young

#20

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Michael J. Griffiths James D. McElhiney	
Serial No.:	08/858,650	
Filing Date:	May 19, 1997	Group Art Unit: 2153
Title:	Information Storage and Delivery Over a Computer Network Using Centralized Intelligence To Monitor and Control the Information Being Delivered	Examiner: Dung Dinh
Our File No.:	18022-001	

TRANSMITTAL OF FORMAL DRAWINGS

To: Box ISSUE FEE
c/o Technology Center 2100
U.S. Patent and Trademark Office
Washington, D.C. 20231

Dear Sir:

In response to the Notice of Allowance and Issue Fee Due dated April 6, 2001, please find enclosed, along with a separate Letter to the Official Draftsman, three (3) sheets of formal drawings containing figures one through four for the above-referenced patent application.

Respectfully submitted,

CHRISMAN, BYNUM & JOHNSON, P.C.

Dated: June 29, 2001

James R. Young, Reg. No. 27,847
1900 Fifteenth Street
Boulder, CO 80302
Telephone: (303) 546-1300

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Michael J. Griffiths James D. McElhiney	
Serial No.:	08/858,650	Group Art Unit: 2153
Filing Date:	May 19, 1997	Examiner:
Title:	Information Storage and Delivery Over a Computer Network Using Centralized Intelligence To Monitor and Control the Information Being Delivered	Dung Dinh
Our File No.:	18022-001	

LETTER TO OFFICIAL DRAFTSPERSON TRANSMITTING FORMAL DRAWINGS

To: Box ISSUE FEE
c/o Technology Center 2100
U.S. Patent and Trademark Office
Washington, DC 20231

Dear Sir/Madam:

Enclosed herewith are three (3) sheets of formal drawings containing figures one through four for the above-referenced patent application.

Respectfully submitted,

Dated: 29 June 2001

James R. Young, Reg. No. 27,847
CHRISMAN, BYNUM & JOHNSON
1900 Fifteenth Street
Boulder, Colorado 80302
Telephone: (303) 546-1300

#B

#19

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Michael J. Griffiths James D. McElhiney	)
Serial No.:	08/858,650	)
Filing Date:	May 19, 1997	) Group Art Unit: 2153
Title:	Information Storage and Delivery Over a Computer Network Using Centralized Intelligence To Monitor and Control the Information Being Delivered	) Examiner: Dung Dinh
Our File No.:	18022-001	)

CERTIFICATE OF MAILING UNDER 37 C.F.R. §1.8

To: Box ISSUE FEE
c/o Technology Center 2100
U.S. Patent and Trademark Office
Washington, DC 20231

The undersigned hereby certifies that the following documents:

1. Certificate of Mailing Under 37 C.F.R. §1.8
2. Form PTOL-85B (Rev.10-96);
3. Chrisman, Bynum & Johnson check no. 86452 in the amount of $1,270.00 ($1,240.00 for Issue Fee and $30.00 for advance order of patent copies);
4. Transmittal of Issue Fee;
5. Transmittal of Formal Drawings;
6. Letter to Office Draftsperson Transmitting Formal Drawings; and
7. Three (3) sheets of formal drawings containing figures one through four; and
8. Return Post Card

are being deposited with the United States Postal Service as first-class mail, postage prepaid, in an envelope addressed to: Box ISSUE FEE, Assistant Commissioner of Patents, Washington, DC 20231, on this 29th day of June 2001.

James R. Young, Registration No. 27,847

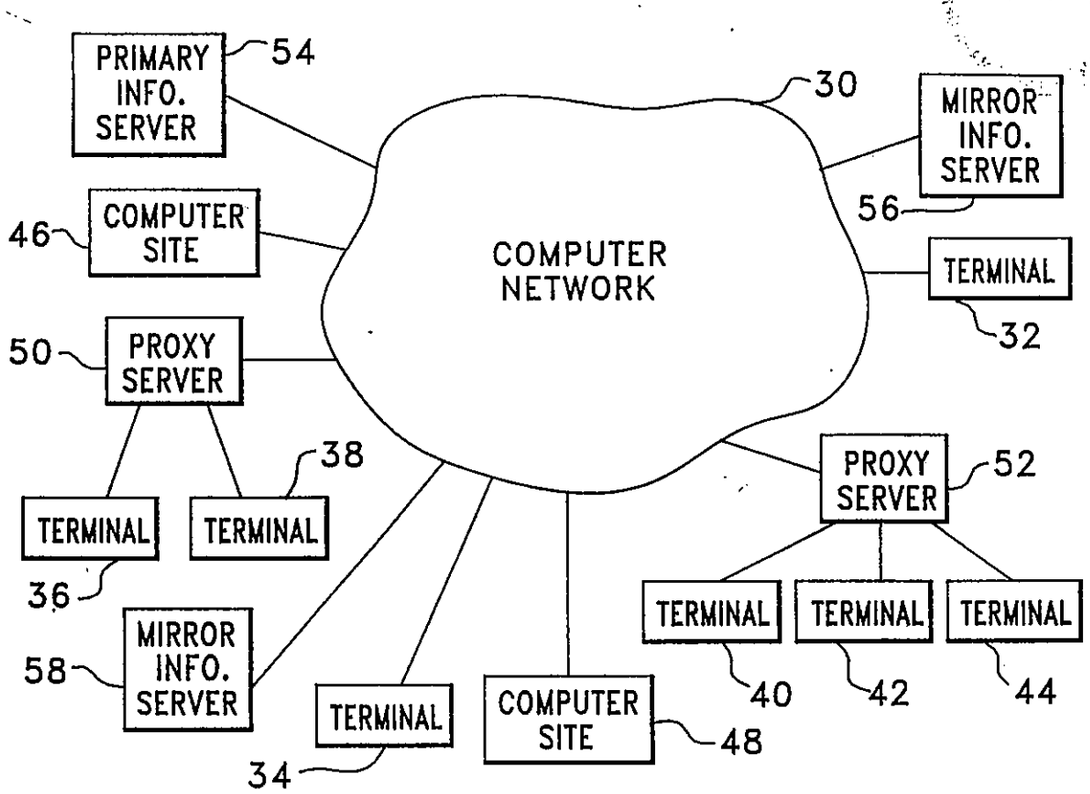

PRIMARY INFO. SERVER
54
30
MIRROR INFO. SERVER
56
COMPUTER SITE
46
COMPUTER NETWORK
TERMINAL
32
PROXY SERVER
50
38
PROXY SERVER
52
TERMINAL
TERMINAL
36
TERMINAL
TERMINAL
TERMINAL
40
42
44
MIRROR INFO. SERVER
58
TERMINAL
34
COMPUTER SITE
48

FIG. 1

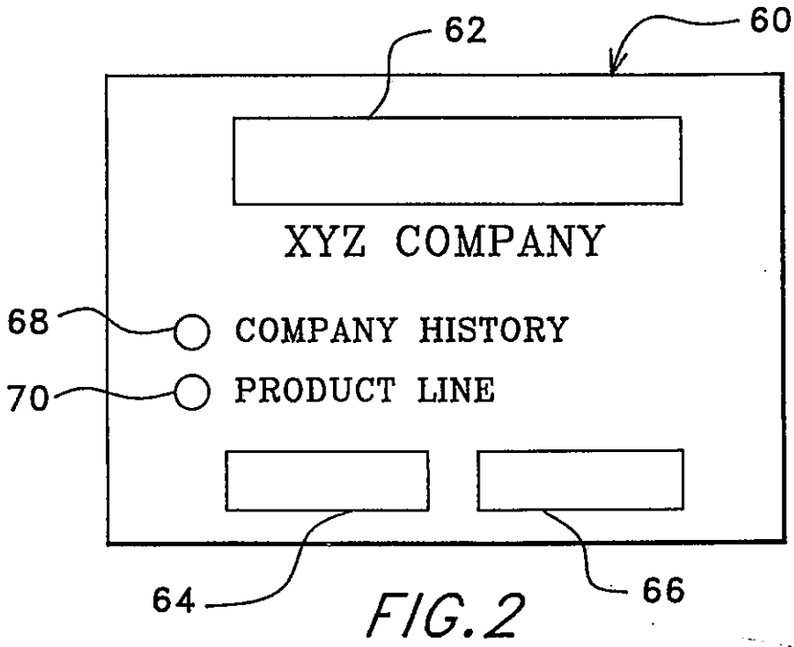

62
60
XYZ COMPANY
68
COMPANY HISTORY
70
PRODUCT LINE
64
66

FIG. 2

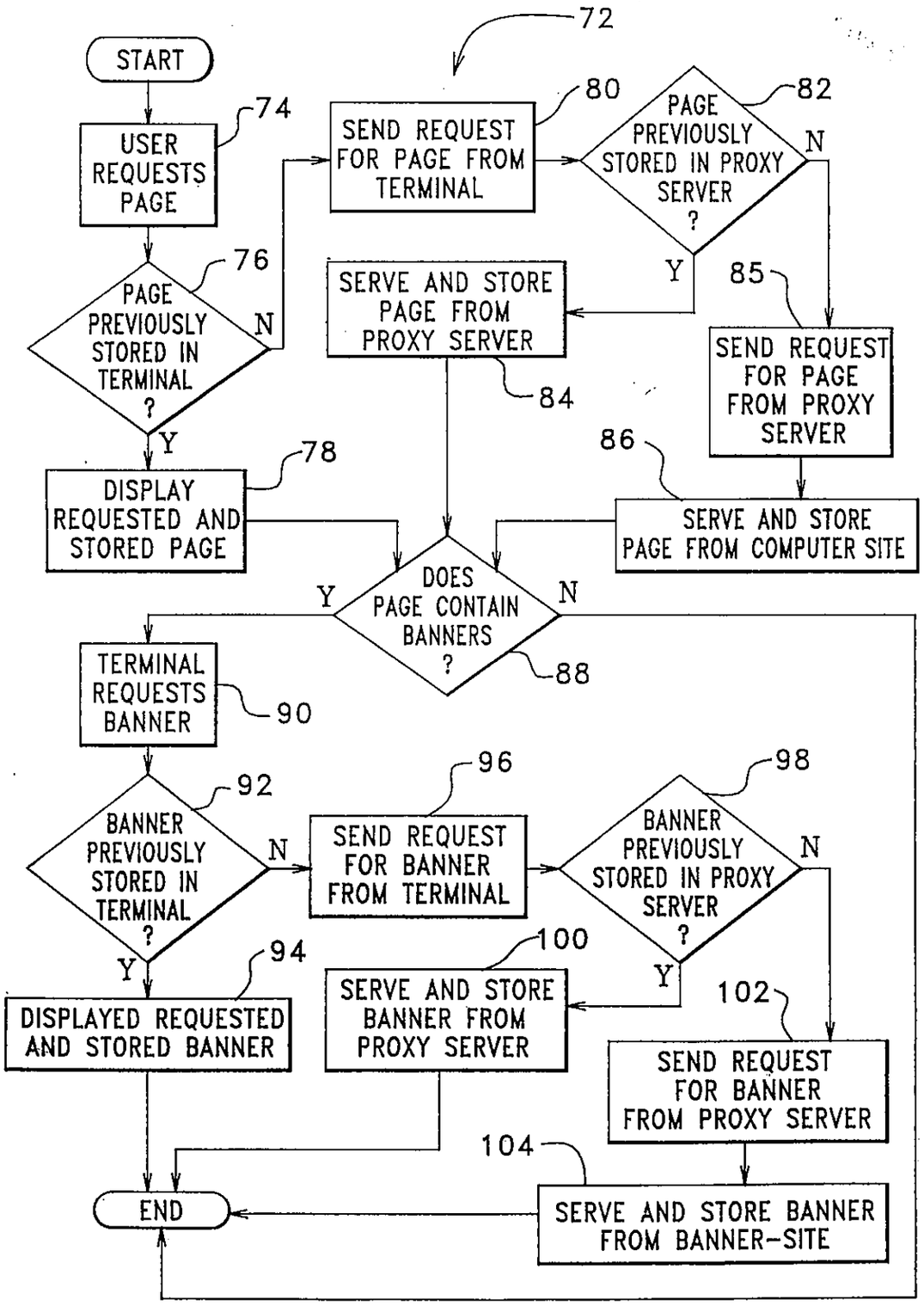


FIG. 3
(PRIOR ART)

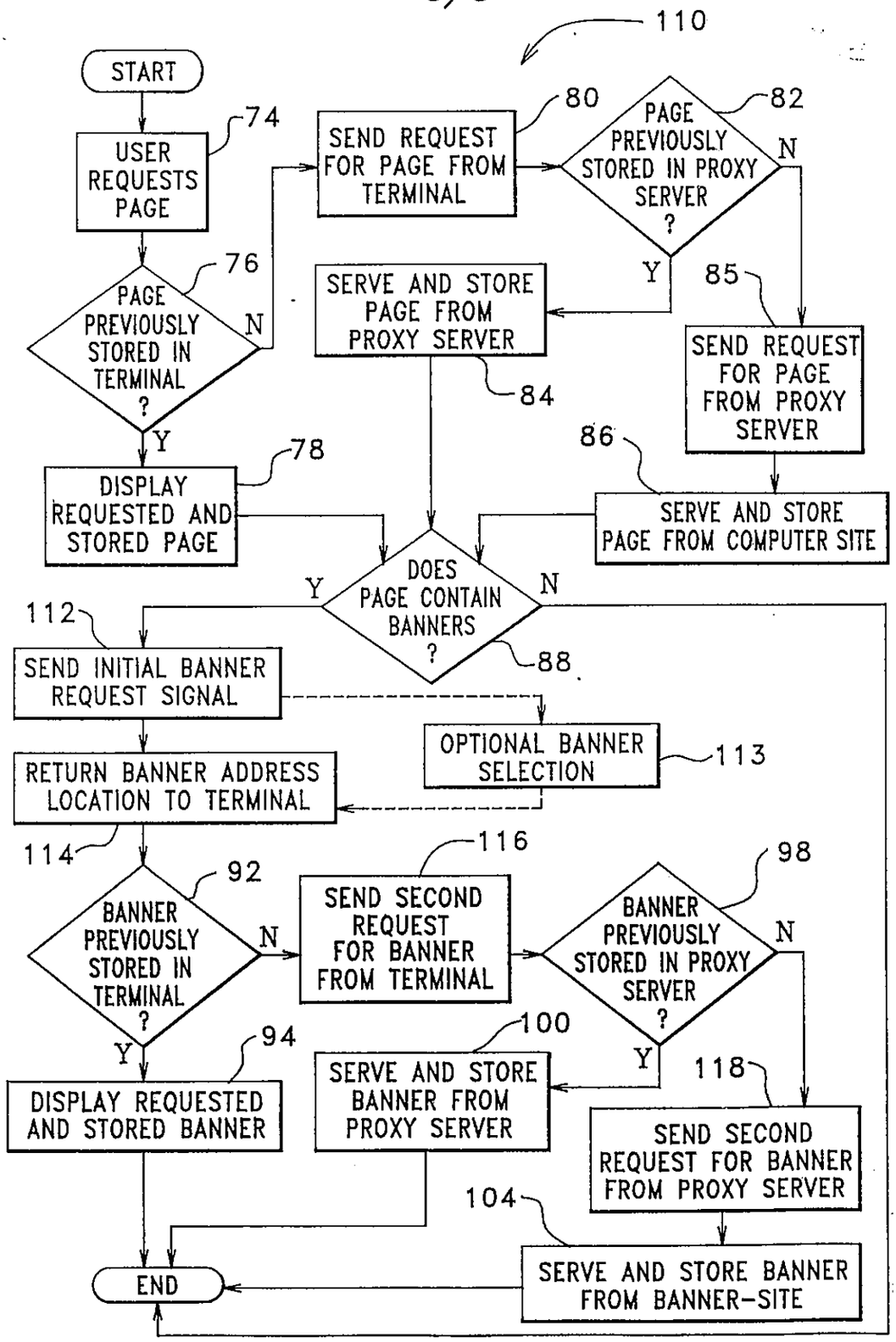

110
START
USER REQUESTS PAGE
74
PAGE PREVIOUSLY STORED IN TERMINAL ?
76
N
Y
DISPLAY REQUESTED AND STORED PAGE
78
SEND REQUEST FOR PAGE FROM TERMINAL
80
PAGE PREVIOUSLY STORED IN PROXY SERVER ?
82
N
Y
SERVE AND STORE PAGE FROM PROXY SERVER
84
SEND REQUEST FOR PAGE FROM PROXY SERVER
85
SERVE AND STORE PAGE FROM COMPUTER SITE
86
DOES PAGE CONTAIN BANNERS ?
88
Y
N
112
SEND INITIAL BANNER REQUEST SIGNAL
OPTIONAL BANNER SELECTION
113
RETURN BANNER ADDRESS LOCATION TO TERMINAL
114
BANNER PREVIOUSLY STORED IN TERMINAL ?
92
N
Y
DISPLAY REQUESTED AND STORED BANNER
94
SEND SECOND REQUEST FOR BANNER FROM TERMINAL
116
BANNER PREVIOUSLY STORED IN PROXY SERVER ?
98
N
Y
SERVE AND STORE BANNER FROM PROXY SERVER
100
SEND SECOND REQUEST FOR BANNER FROM PROXY SERVER
118
SERVE AND STORE BANNER FROM BANNER-SITE
104
END

FIG. 4

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

PAYOR NUMBER
28286

P75M

FAEGRE & BENSON LLP
Attn: PATENT DOCKETING
2200 WELLS FARGO CENTER
90 SOUTH 7TH STREET
MINNEAPOLIS MN 55402-3901

DATE PRINTED
10/05/05

NOTICE OF PATENT EXPIRATION

According to the records of the U.S. Patent and Trademark Office (USPTO), payment of the maintenance fee for the patent(s) listed below has not been received timely prior to the end of the six-month grace period in accordance with 37 CFR 1.362(e). THE PATENT(S) LISTED BELOW HAS THEREFORE EXPIRED AS OF THE END OF THE GRACE PERIOD. 35 U.S.C. 41(b). Notice of the expiration will be published in the USPTO Official Gazette.

Expired patents may be reinstated in accordance with 37 CFR 1.378 if upon petition, the maintenance fee and the surcharge set forth in 37 CFR 1.20(i) are paid, AND the delay in payment of the maintenance fee is shown to the satisfaction of the Director to have been unavoidable or unintentional. 35 U.S.C. 41(c)(1).

If the Director accepts payment of the maintenance fee and surcharge upon petition under 37 CFR 1.378, the patent shall be considered as not having expired but would be subject to the intervening rights and conditions set forth in 35 U.S.C. 41(c)(2).

For instructions on filing a petition under 37 CFR 1.378 to reinstate an expired patent, you may call the USPTO Contact Center at 800-786-9199 or 703-308-4357.

PATENT NUMBER	U.S. APPLICATION NUMBER	PATENT ISSUE DATE	APPLICATION FILING DATE	EXPIRATION DATE	ATTORNEY DOCKET NUMBER
6286045	08858650	09/04/01	05/19/97	09/06/05	101001

MA441C (5/2004)

TRANSMITTAL FORM

(to be used for all correspondence during pendency of filed application)

Patent Number	6,286,045 B1
Issue Date	September 4, 2001
First Named Inventor	Michael John Griffiths
Group Art Unit Number	N/A
Examiner Name	Dung C. Dinh
Total Number of Pages in This Submission: 4	Attorney Docket Number: 19675-11596

ENCLOSURES *(check all that apply)*

- ☐ Fee Transmittal Form (in duplicate)
- ☒ Check Enclosed
- ☐ Return Receipt Postcard
- ☒ Petition to Accept Unintentionally Delayed Payment of Maintenance Fee in an Expired Patent
- ☐
- ☐ Declaration
- ☐ Power of Attorney to Prosecute Before the USPTO
- ☐ Statement Under 37 CFR 3.73(b)
- ☐ Copy of Assignment
- ☐ Request for Corrected Filing Receipt
- ☐ Request for Correction of Recorded Assignment
- ☐ Amendment: [ ] Page(s)
  - ☐ After Final
- ☐ Status Request
- ☐ Revocation and Substitute Power of Attorney
- ☐ Issue Fee Transmittal
- ☐ Letter to Chief Draftsperson
- ☐ Formal Drawing(s): (Replacement Sheets)
  [ ] Sheet(s) of Figure(s) [ ]
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☐ Appeal Communication to Group *(Appeal Notice, Brief, Reply Brief)*
- ☐ Certified Copy of Priority Document(s)
- ☐ After Allowance Communication to Group
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

REMARKS:

SIGNATURE OF ATTORNEY OR AGENT

Signature:			
Attorney/Reg. No.:	Brian M. Hoffman, Reg. No.: 39,713	Dated:	May 2, 2006

CERTIFICATE OF MAILING

I hereby certify that this correspondence, including the enclosures identified above, is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop Petition, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below. If the Express Mail Mailing Number is filled in below, then this correspondence is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service pursuant to 37 CFR 1.10.

Signature:			
Typed or Printed Name:	Brian M. Hoffman	Dated:	5/2/06
Express Mail Mailing Number *(optional)*:			

20423/01000/SF/5167969.1

DAC

PETITION TO ACCEPT UNINTENTIONALLY DELAYED PAYMENT OF MAINTENANCE FEE IN AN EXPIRED PATENT (37 CFR 1.378(c))

Docket Number (Optional)
20423-11596

#31

Mail to: Mail Stop Petition
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

NOTE: If information or assistance is needed in completing this form, please contact Petitions Information at (703) 305-9282.

Patent No. 6,286,045 B1 Application Number 08/858,650

Issue Date September 4, 2001 Filing Date May 19, 1997

CAUTION: Maintenance fee (and surcharge, if any) payment must correctly identify: (1) the patent number (or reissue patent number, if a reissue) and (2) the application number of the actual U.S. application (or reissue application) leading to issuance of that patent to ensure the fee(s) is/are associated with the correct patent. 37 CFR 1.366(c) and (d).

Also complete the following information, if applicable

The above-identified patent:

☐ is a reissue of original Patent No. _____, original issue date _____; original application number _____, original filing date _____.

☐ resulted from the entry into the U.S. under 35 U.S.C. 371 of international application _____ filed on _____.

CERTIFICATE OF MAILING OR TRANSMISSION [37 CFR 1.8(a)]

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to the Mail Stop Petition, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

May 2, 2006
Date

Signature

Brian Hoffman
Typed or printed name of person signing Certificate

Adjustment date: 10/10/2006 CKHLOK
05/08/2006 TBESHAH1 00000016 6286045
01 FC:1599 -2540.00 OP

10/10/2006 CKHLOK 00000005 6286045
01 FC:1551 900.00 OP
02 FC:1558 1640.00 OP

05/08/2006 TBESHAH1 00000016 6286045
01 FC:1599 2540.00 OP

[Page 1 of 3]

20423/01000/SF/5167967.1

1. SMALL ENTITY

☐ Patentee claims, or has previously claimed, small entity status. See 37 CFR 1.27.

2. LOSS OF ENTITLEMENT TO SMALL ENTITY STATUS

☒ Patentee is no longer entitled to small entity status. See 37 CFR 1.27(g).

3. MAINTENANCE FEE (37 CFR 1.20(e)-(g))

The appropriate maintenance fee must be submitted with this petition, unless it was paid earlier.

NOT Small Entity				Small Entity			
	Amount	Fee	(Code)		Amount	Fee	(Code)
☒	$900.00	3½ yr fee	(1551)	☐	$_____	3½ yr fee	(2551)
☐	$_____	7½ yr fee	(1552)	☐	$_____	7½ yr fee	(2552)
☐	$_____	11½ yr fee	(1553)	☐	$_____	11½ yr fee	(2553)

MAINTENANCE FEE BEING SUBMITTED $_____

4. SURCHARGE

The surcharge required by 37 CFR 1.20(i)(2) of $1,640.00 (Fee Code 1558) must be paid as a condition of accepting unintentionally delayed payment of the maintenance fee.

SURCHARGE FEE BEING SUBMITTED $1,640.00

5. MANNER OF PAYMENT

☒ Enclosed is a check for the sum of $2,540.00.

☐ Please charge Deposit Account No. _____ the sum of $_____. A duplicate copy of this authorization is attached.

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

6. AUTHORIZATION TO CHARGE ANY FEE DEFICIENCY

☒ The Commissioner is hereby authorized to charge any maintenance fee, surcharge or petition deficiency to Deposit Account No. 19-2555. A duplicate copy of this authorization is attached.

7. OVERPAYMENT

As to any overpayment made please

☒ Credit to Deposit Account No. 19-2555.

OR

☐ Send refund check.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

8. STATEMENT

The delay in payment of the maintenance fee to this patent was unintentional.

9. PETITIONER(S) REQUEST THAT THE DELAYED PAYMENT OF THE MAINTENANCE FEE BE ACCEPTED AND THE PATENT REINSTATED.

May 2, 2006
Date

Signature(s) of Petitioner(s)

Telephone
Number: (415) 875-2484

Brian M. Hoffman, Reg. No. 39,713
Typed or printed name(s)

Address

Fenwick & West LLP

Silicon Valley Center

801 California Street

Mountain View, CA 94041

37 CFR 1.378(d) states: "Any petition under this section must be signed by an attorney or agent registered to practice before the Patent and Trademark Office, or by the patentee, the assignee, or other party in interest."

Enclosures:

☒ Maintenance Fee payment

☒ Surcharge

☐ _____

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

Paper No. 22

BRIAN M. HOFFMAN
FENWICK & WEST LLP
SILICON VALLEY CENTER
801 CALIFORNIA STREET
MOUNTAIN VIEW, CA 94041

COPY MAILED

OCT 10 2006

OFFICE OF PETITIONS

In re Patent No. 6,286,045	:	
Issue Date: September 4, 2001	:	
Application No. 08/858,650	:	ON PETITION
Filed: May 19, 1997	:	
Patentee(s) Michael John Griffiths et al	:	

This is a decision on the petition under 37 CFR 1.378(c), filed May 5, 2006, to accept the delayed payment of a maintenance fee for the above-identified patent.

The petition is **GRANTED**.

The maintenance fee is hereby accepted and the above-identified patent is reinstated as of the mail date of this decision.

It is not apparent whether the person signing the statement of unintentional delay was in a position to have firsthand or direct knowledge of the facts and circumstances of the delay at issue. Nevertheless, such statement is being treated as having been made as the result of a reasonable inquiry into the facts and circumstances of such delay. In the event that such an inquiry has been made, petitioner must make such an inquiry. If such inquiry results in the discovery that the delay in paying the maintenance fee under 37 CFR 1.378(c) was intentional, petitioner must notify the Office.

Petitioner will not receive future correspondence related to maintenance fees for the above-identified patent unless a fee address@ (see PTO/SB/47) is submitted for the above-identified patent.

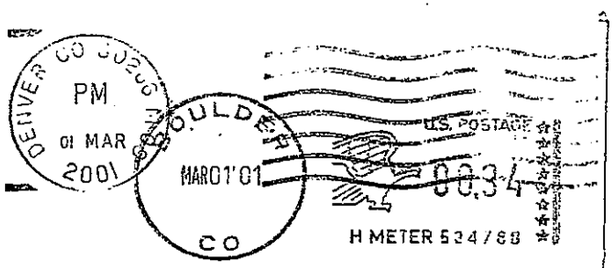
Telephone inquiries concerning this decision should be directed to Irvin Dingle at (571) 272-3210.

The patent file is being forwarded to Files Repository.

Irvin Dingle
Petitions Examiner
Office of Petitions

CHRISMAN BYNUM & JOHNSON

ATTORNEYS AND COUNSELORS AT LAW
1900 FIFTEENTH STREET
BOULDER, COLORADO 80302



Box Fee Amendment
Assistant Commissioner for Patents
Washington, DC 20231

PATENT NUMBER

APPLICATION SERIAL NUMBER
08/858,650

APPLICANT'S NAME (PLEASE PRINT)

IF REISSUE, ORIGINAL PATENT NUMBER

INTERNATIONAL CLASSIFICATION

G	0	6	F		13	00

ORIGINAL CLASSIFICATION

CLASS	SUBCLASS
709	224

CROSS REFERENCE(S)

CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)			
709	219			
705	14			
707	501			

GROUP ART UNIT: 2153

ASSISTANT EXAMINER (PLEASE STAMP OR PRINT FULL NAME)

PRIMARY EXAMINER (PLEASE STAMP OR PRINT FULL NAME)
DUNG C. DINH

PTO 270
(REV. 5-91)

ISSUE CLASSIFICATION SLIP

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE

PATENT APPLICATION FEE DETERMINATION RECORD

Effective October 1, 1996

Application or Docket Number: 08/858650

1,16,27,34,37 CLAIMS AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA
BASIC FEE		
TOTAL CLAIMS	42 minus 20 =	* 22
INDEPENDENT CLAIMS	5 minus 3 =	* 2
MULTIPLE DEPENDENT CLAIM PRESENT		

	SMALL ENTITY RATE	SMALL ENTITY FEE		OTHER THAN SMALL ENTITY RATE	OTHER THAN SMALL ENTITY FEE
		385.00	OR		770.00
TOTAL CLAIMS	x$11=		OR	x$22=	484
INDEPENDENT CLAIMS	x40=		OR	x80=	160
MULTIPLE DEPENDENT CLAIM PRESENT	+130=		OR	+260=	
	TOTAL		OR	TOTAL	644

* If the difference in column 1 is less than zero, enter "0" in column 2

CLAIMS AS AMENDED - PART II

AMENDMENT A

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

	SMALL ENTITY RATE	SMALL ENTITY ADDITIONAL FEE		OTHER THAN SMALL ENTITY RATE	OTHER THAN SMALL ENTITY ADDITIONAL FEE
TOTAL CLAIMS	x$11=		OR	x$22=	
INDEPENDENT CLAIMS	x40=		OR	x80=	
MULTIPLE DEPENDENT CLAIM PRESENT	+130=		OR	+260=	
	TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT B

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

	SMALL ENTITY RATE	SMALL ENTITY ADDITIONAL FEE		OTHER THAN SMALL ENTITY RATE	OTHER THAN SMALL ENTITY ADDITIONAL FEE
TOTAL CLAIMS	x$11=		OR	x$22=	
INDEPENDENT CLAIMS	x40=		OR	x80=	
MULTIPLE DEPENDENT CLAIM PRESENT	+130=		OR	+260=	
	TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT C

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

	SMALL ENTITY RATE	SMALL ENTITY ADDITIONAL FEE		OTHER THAN SMALL ENTITY RATE	OTHER THAN SMALL ENTITY ADDITIONAL FEE
TOTAL CLAIMS	x$11=		OR	x$22=	
INDEPENDENT CLAIMS	x40=		OR	x80=	
MULTIPLE DEPENDENT CLAIM PRESENT	+130=		OR	+260=	
	TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

FORM PTO-875 (Rev. 10/96)
*U.S. Government Printing Office: 1996 - 413-288/49191
Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

PATENT APPLICATION FEE DETERMINATION RECORD

Effective October 1, 1997

Application or Docket Number

CLAIMS AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA
BASIC FEE		
TOTAL CLAIMS	42 minus 20 =	* 22
INDEPENDENT CLAIMS	5 minus 3 =	* 2
MULTIPLE DEPENDENT CLAIM PRESENT		

* If the difference in column 1 is less than zero, enter "0" in column 2

SMALL ENTITY TYPE ☐		OR	OTHER THAN SMALL ENTITY	
RATE	FEE		RATE	FEE
	395.00	OR		2 790.00
x$11=	242	OR	x$22=	484-
x41=	82	OR	x82=	164
+135=		OR	+270=	
TOTAL	719	OR	TOTAL	1438-

CLAIMS AS AMENDED - PART II

AMENDMENT A

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	* 78	Minus	** 42	= 36
Independent	* 9	Minus	*** 5	= 4
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
x$11=	324.00	OR	x$22=	
x41=	156.00	OR	x82=	
+135=		OR	+270=	
TOTAL ADDIT. FEE	480.00	OR	TOTAL ADDIT. FEE	

AMENDMENT B

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
x$11=		OR	x$22=	
x41=		OR	x82=	
+135=		OR	+270=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT C

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
x$11=		OR	x$22=	
x41=		OR	x82=	
+135=		OR	+270=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

FORM PTO-875 (Rev. 8/97) *U.S. Government Printing Office: 1997 - 430-571/69194 Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

CHECKLIST FOR PROCESSING NEW APPLICATIONS

SERIAL NUMBER 08/858650 revised 6/29/95

INSTRUCTIONS:

1. Make a checkmark beside each item IF verified.
2. If corrections are required, write notes to the examiner or supervisor on reverse side.

1. FACE OF THE FILE

____1. Printed and stamped serial numbers match the bar code label.
____2. Filing Date present.
____3. Class/Subclass present.
____4. Applicant(s) name present.
____5. Total number of drawings present.
____6. Total number of claims present.
____7. Total number of independent claims present.
____8. Filing fee received present.
____9. Mailing address present.
____10. Title of invention present.

2. CENTER OF THE FILE

A. DRAWINGS

____1. None (go to B)
____2. Serial Number present and correct on each sheet.
____3. Number of sheets entered on line 1 of contents.

B. SMALL ENTITY STATEMENT

____1. None and not recorded on face of file (go to C)
____2. Statement present.
____3. Small Entity recorded on face of file.

C. DECLARATION OR OATH

____1. Title matches face of file and specification.
____2. Declaration phrase present. (I hereby declare all...)
____3. (Original and first inventor or inventors...) phrase present.
____4. (Reviewed and understand the contents of the application, including claims...) phrase present.
____5. (Acknowledge duty to disclose information in accordance with 1.56(a)...) phrase present.
____6. Residence, citizenship, post office address of all applicants present.
____7. Signed by all applicants.
____8. Less than 3 months before filing date, or less than six months after filing date.

D. CLAIMS (as filed)

____1. Complete form 1360 and 875: (forms on right side of file)
____2. Circle independent claims on the Index of Claims.
____3. Draw line under the last claim number on the Index of Claims.

E. SPECIFICATION

____1. Serial Number present and correct.
____2. Specification in permanent ink.
____3. Brief Description of each drawing figure.
____4. No missing or duplicate pages.
____5. No holes punched in text.

F. ABSTRACT

____1. None (go to G)
____2. Serial Number present and correct.
____3. Abstract on seperate page.
____4. 25 lines or less.
____5. One paragraph ONLY.

G. PTO-1556

____1. Present

H. PRE-AMENDMENTS (found on right side of file)

____1. None (go to I)
____2. Enter on Contents of filewrapper.
____3. Instruction to cancel claims.
____4. Claims canceled on Index of Claims.
____5. Instruction to add claims.
____6. Circle new independent claims on the Index of Claims.
____7. Draw line under the new last claim number on Index of Claims.
____8. Complete forms 1360 and 875.

I. PTO-948

____1. Present

3. RIGHT SIDE OF FILE

____1. PALM File Data sheet present.
____2. Transmittal letters present.
____3. Forms 1360 & 875 present/complete.
____4. Miscellaneous Papers present/entered.
____5. Petition to Make Special present. (Enter and place in the center)
____6. Drawing prints present. (2 copies)

FEES

____1. Correct filing fee paid.
____2. Excess claims fees paid:
____a. Excess total claims more than 20.
____b. Excess independent claims more than 3.
____c. First multiple dependent claim fee paid.
____3. Miscellaneous paper fee paid.

FINAL STEPS

____1. Sign and date center of filewrapper, under flap.
____2. Docketed to examiner.

NOTES TO SUPERVISOR:

NOTES TO EXAMINER:

SIGNATURE OF PREPARER:

L. Badia

DATE: 2/23/98

MULTIPLE DEPENDENT CLAIM FEE CALCULATION SHEET

(FOR USE WITH FORM PTO-875)

SERIAL NO. 08/858,650

FILING DATE 5/19/97

APPLICANT(S)

CLAIMS

	AS FILED		AFTER 1st AMENDMENT		AFTER 2nd AMENDMENT	
	IND.	DEP.	IND.	DEP.	IND.	DEP.
1	1					
2		1				
3		1				
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48						
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50						
TOTAL IND.	5					
TOTAL DEP.	37					
TOTAL CLAIMS	42					

	*		*		*	
	IND.	DEP.	IND.	DEP.	IND.	DEP.
51						
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100						
TOTAL IND.						
TOTAL DEP.						
TOTAL CLAIMS						

PTO-1360 (3-78)

*MAY BE USED FOR ADDITIONAL CLAIMS OR AMENDMENTS

U.S. DEPARTMENT of COMMERCE
Patent and Trademark Office

Form PTO 1130
(REV 2/94)

U.S. DEPARTMENT OF COMMERCE
Patent and Trademark Office

PACE DATA ENTRY CODING SHEET

1ST EXAMINER	DATE
2ND EXAMINER	DATE

70270 U.S. PTO
08/858650
05/19/97

APPLICATION NUMBER | TYPE APPL | FILING DATE (MONTH DAY YEAR) | SPECIAL HANDLING | GROUP ART UNIT | CLASS | SHEETS OF DRAWING

TOTAL CLAIMS | INDEPENDENT CLAIMS | SMALL ENTITY? | FILING FEE | FOREIGN LICENSE | ATTORNEY DOCKET NUMBER

CONTINUITY DATA

CONT CODE	STATUS CODE	PARENT APPLICATION SERIAL NUMBER	PCT APPLICATION SERIAL NUMBER	PARENT PATENT NUMBER	PARENT FILING DATE (MONTH DAY YEAR)
			PCT/ /		
			PCT/ /		
			PCT/ /		
			PCT/ /		
			PCT/ /		

PCT/FOREIGN APPLICATION DATA

FOREIGN PRIORITY CLAIMED	COUNTRY CODE	PCT/FOREIGN APPLICATION SERIAL NUMBER	FOREIGN FILING DATE (MONTH DAY YEAR)

[redacted]

SEARCHED

Class	Sub.	Date	Exmr.
709	217	12/16/99	[illegible]
	218		
	219		
	221		
	207		
	229		
	230		
	238		
	239		
705	14		
	10		
	26		
	27		
	1		
707	10		
	501		
	503		

INTERFERENCE SEARCHED

Class	Sub.	Date	Exmr.
709	219	3/27/01	[illegible]
705	221		
	14		
707	501		

SEARCH NOTES

	Date	Exmr.
web search from 08/738,634	3/2/99	[illegible]
TLee - interference? w/ 08/138,634	12/13/99	[illegible]
ACM IEEE proxy cache & web page request	9/10/00	[illegible]

POSITION		ID NO.	DATE
CLASSIFIER			7/21/97
EXAMINER		422	10-6
TYPIST			
VERIFIER			
CORPS CORR.			
SPEC. HAND			
FILE MAINT.			
DRAFTING			

INDEX OF CLAIMS

Claim Final	Claim Original	Date
1	1	5/2/97
	2	
3	3	
4	4	
5	5	
6	6	
7	7	
8	8	
9	9	
10	10	
11	11	
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66	50	

Claim Final	Claim Original	Date
67	51	✓
68	52	
69	53	
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2	59	
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	100	

SYMBOLS

- ✓ ..... Rejected
- = ... Allowed
- - (Through numberal) Canceled
- + ... Restricted
- N ..... Non-elected
- I ..... Interference
- A ..... Appeal
- O ..... Objected

(LEFT INSIDE)

US006286045B1

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

(10) **Patent No.: US 6,286,045 B1**
(45) **Date of Patent: *Sep. 4, 2001**

(54) **INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMATION BEING DELIVERED**

(75) Inventors: **Michael John Griffiths**, Broomfield, CO (US); **James David McElhiney**, Ottawa (CA)

(73) Assignee: **Matchlogic, Inc.**, Louisville, CO (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **08/858,650**

(22) Filed: **May 19, 1997**

(51) **Int. Cl.**[7] **G06F 13/00**

(52) **U.S. Cl.** **709/224**; 709/219; 705/14; 707/501

(58) **Field of Search** 709/217, 218, 709/219, 224, 221, 229, 230, 238, 239; 705/14, 10, 26, 27, 1; 707/20, 501, 503

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(List continued on next page.)

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Goldberg et al., "Beyond the Web: Excavating the Real world via Mosaic", Second International WWW Conference, 1994. Source: Internet, retrieved May 2, 1996 from http://www.usc.edu/dept/raiders/paper/.*

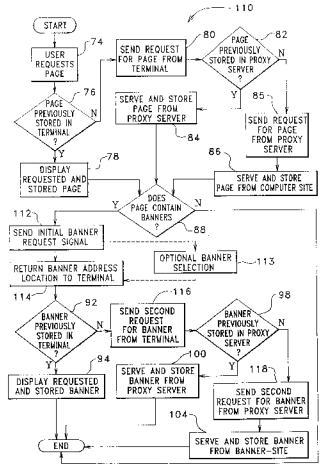
(List continued on next page.)

Primary Examiner—Dung C. Dinh
(74) *Attorney, Agent, or Firm*—James R. Young; Chrisman Bynum & Johnson

(57) **ABSTRACT**

A system for storing information on a computer network and allowing the information to be accessed by terminals connected to the computer network, either directly, or through an intermediary device such as a local or proxy server, includes computer or web sites which store pages requested by terminals for display on the terminals. The pages may include references to banners to be displayed in conjunction with the web pages on the terminal. The terminal initiates access or connection to a desired computer or web site to access a desired page. After the desired page is downloaded, transmitted, or served to the terminal from the computer or web site, the terminal initiates and sends an initial banner request signal to an information server. The information server returns a redirect signal to the terminal telling the terminal the location of the desired banner on the computer network, which may be the information server, the computer site, or some other information server, computer site, or location accessible via the computer network. The terminal then initiates a second banner request signal to the location of the desired banner and the banner is served to the terminal for display on the terminal, unless the requested banner has previously been stored or cached in the terminal's memory or in the memory of a local or proxy server connected to the terminal, in which case the second banner request signal is not sent across the computer network and the banner is loaded directly from the terminal's memory or served to the terminal from the proxy server.

78 Claims, 3 Drawing Sheets



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* cited by examiner

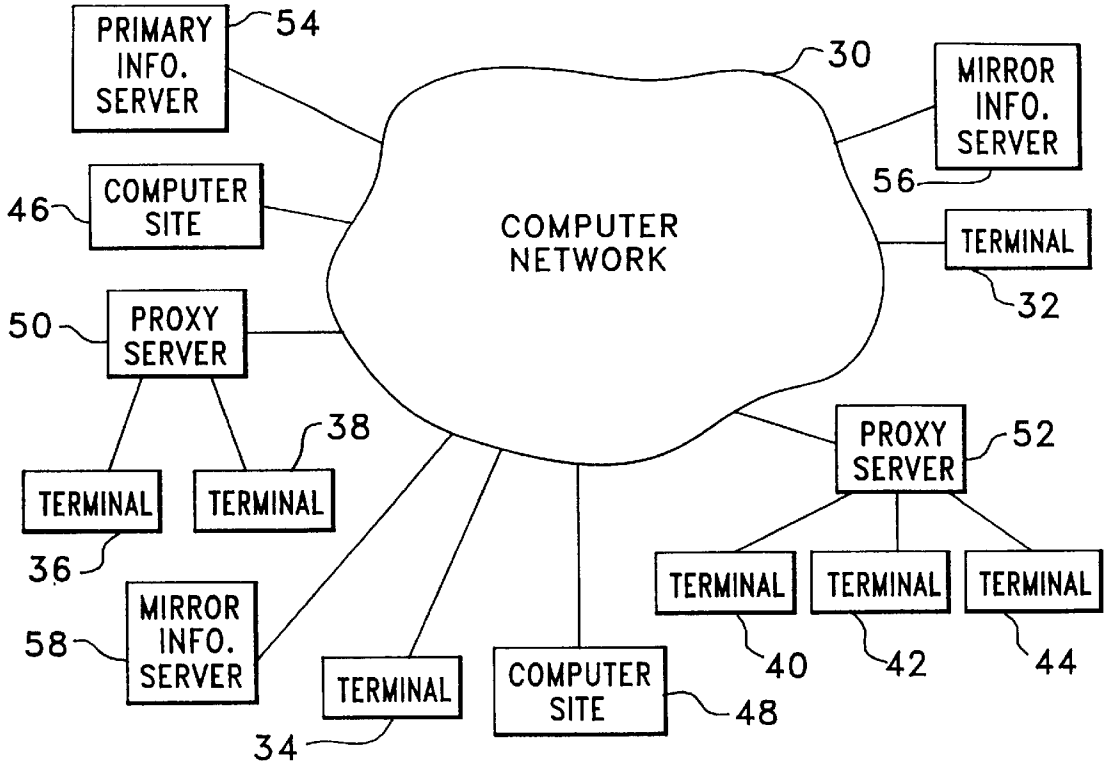
PRIMARY INFO. SERVER
54
30
MIRROR INFO. SERVER
56
COMPUTER SITE
46
COMPUTER NETWORK
TERMINAL
32
PROXY SERVER
50
38
PROXY SERVER
52
TERMINAL
TERMINAL
36
TERMINAL
TERMINAL
TERMINAL
MIRROR INFO. SERVER
58
TERMINAL
34
COMPUTER SITE
48
40
42
44

FIG. 1

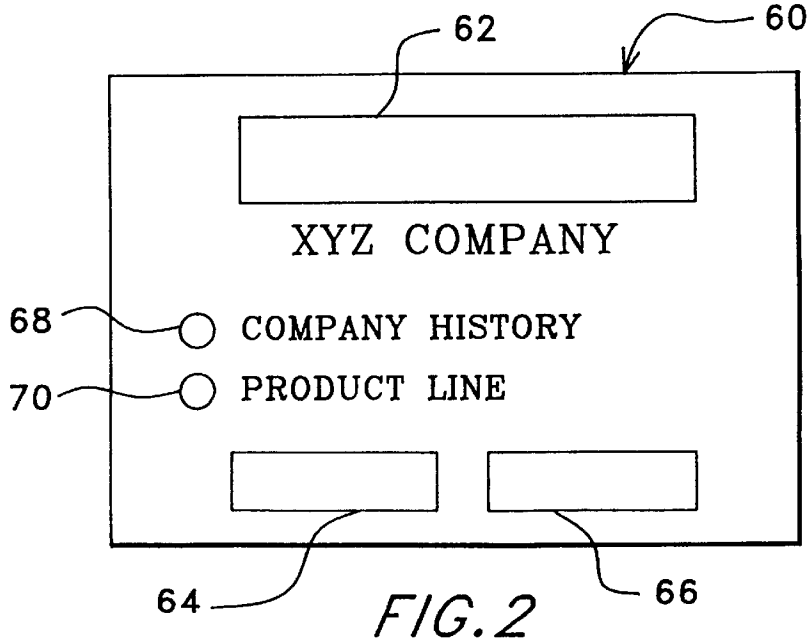
62
60
XYZ COMPANY
68
COMPANY HISTORY
70
PRODUCT LINE
64
66

FIG. 2

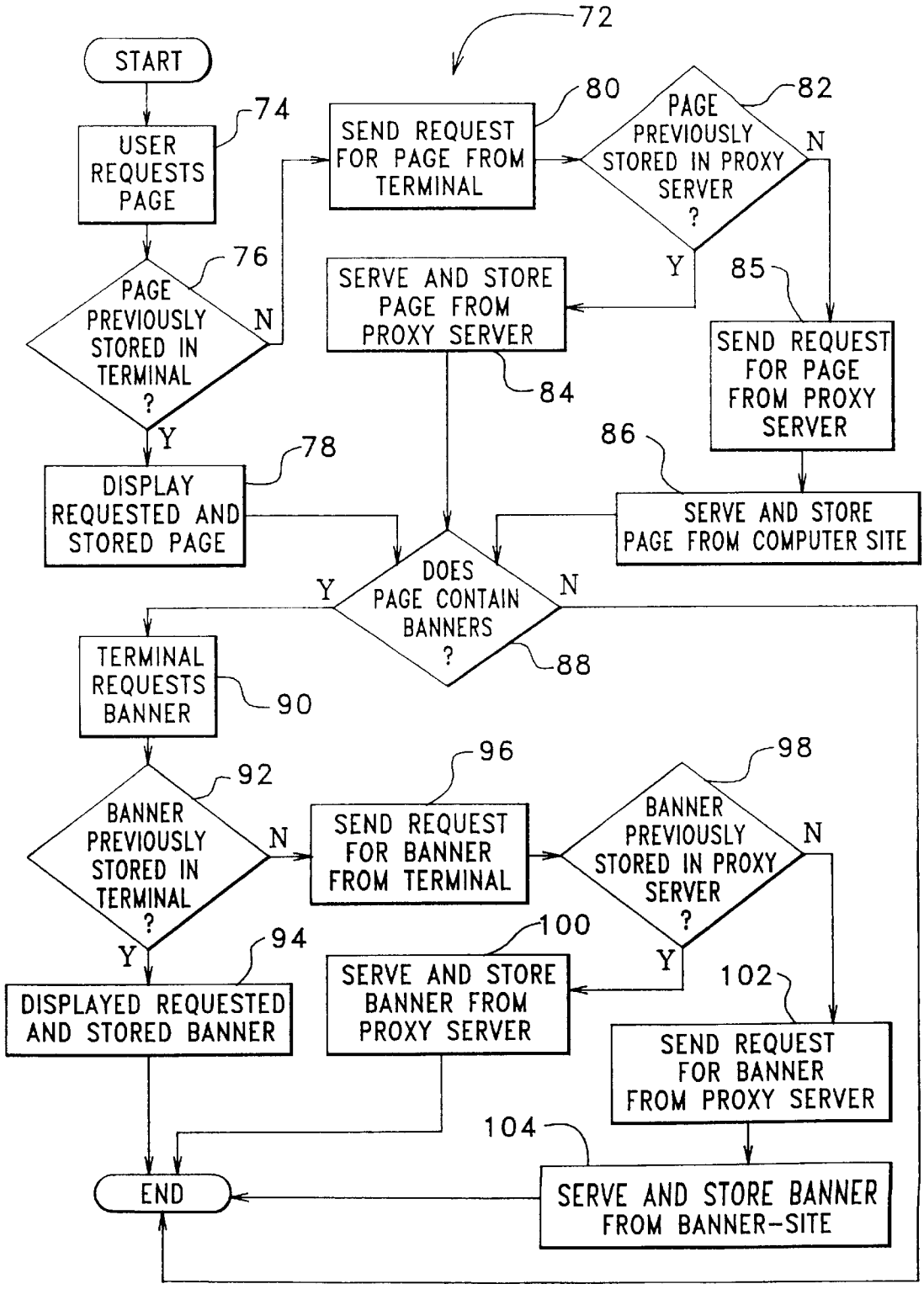

FIG. 3
(PRIOR ART)

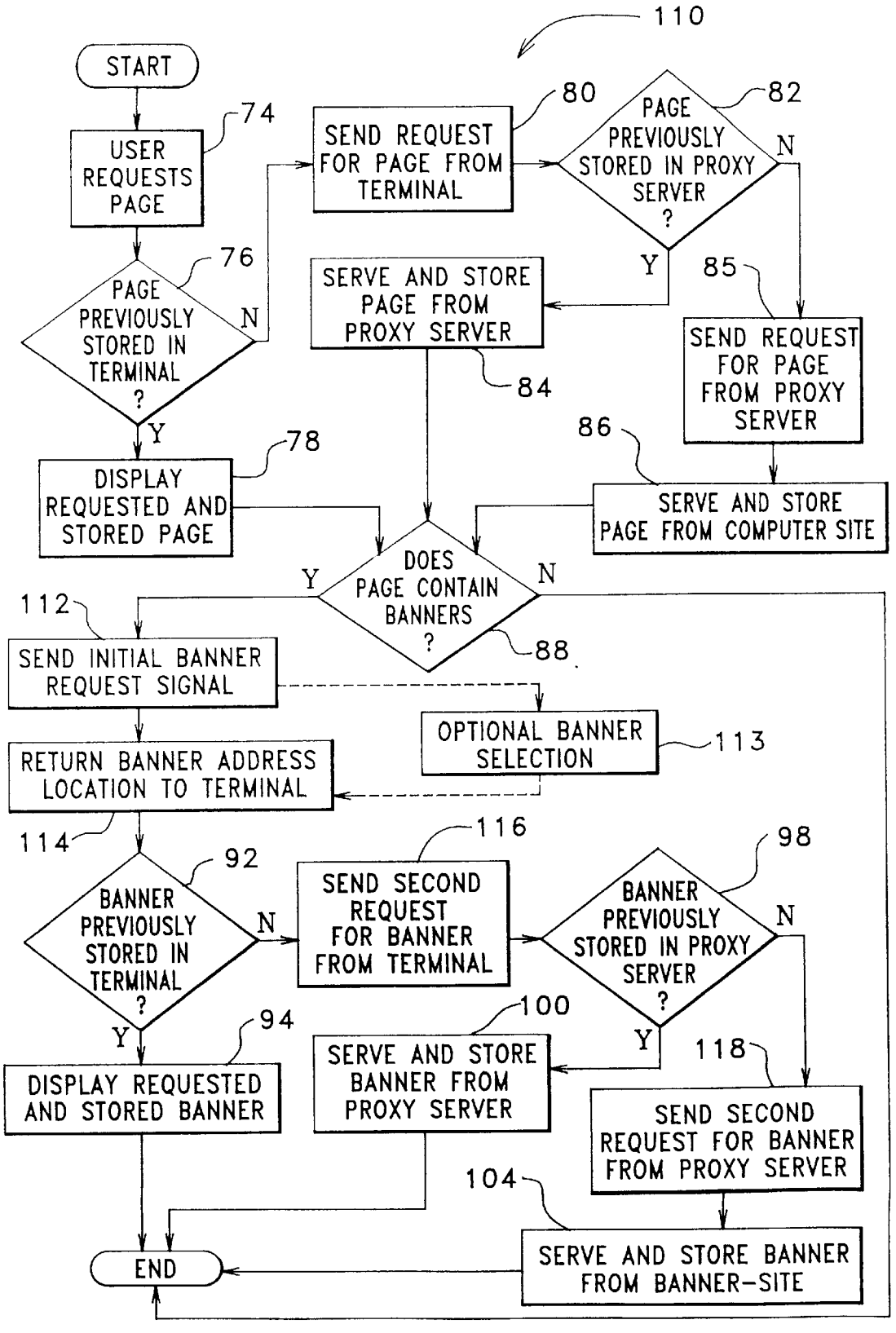
110
START
USER REQUESTS PAGE
74
PAGE PREVIOUSLY STORED IN TERMINAL ?
76
N
Y
DISPLAY REQUESTED AND STORED PAGE
78
SEND REQUEST FOR PAGE FROM TERMINAL
80
PAGE PREVIOUSLY STORED IN PROXY SERVER ?
82
N
Y
SERVE AND STORE PAGE FROM PROXY SERVER
84
SEND REQUEST FOR PAGE FROM PROXY SERVER
85
SERVE AND STORE PAGE FROM COMPUTER SITE
86
DOES PAGE CONTAIN BANNERS ?
88
Y
N
SEND INITIAL BANNER REQUEST SIGNAL
112
OPTIONAL BANNER SELECTION
113
RETURN BANNER ADDRESS LOCATION TO TERMINAL
114
BANNER PREVIOUSLY STORED IN TERMINAL ?
92
N
Y
DISPLAY REQUESTED AND STORED BANNER
94
SEND SECOND REQUEST FOR BANNER FROM TERMINAL
116
BANNER PREVIOUSLY STORED IN PROXY SERVER ?
98
N
Y
SERVE AND STORE BANNER FROM PROXY SERVER
100
SEND SECOND REQUEST FOR BANNER FROM PROXY SERVER
118
SERVE AND STORE BANNER FROM BANNER-SITE
104
END

FIG. 4

INFORMATION STORAGE AND DELIVERY OVER A COMPUTER NETWORK USING CENTRALIZED INTELLIGENCE TO MONITOR AND CONTROL THE INFORMATION BEING DELIVERED

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to the system for the storage, management, and delivery of information on a computer network and, more specifically, to the efficient and reliable storage, delivery, and monitoring of advertising and other information on a computer network.

2. Description of the Prior Art

During recent years there have been rapid advancements in computers and computer networking. In particular, the world-wide network of computers commonly referred to as the Internet has seen explosive growth. The Internet comprises a vast network of smaller wide area and local area computer networks connected together so as to allow the sharing of resources and to facilitate data communication between computers and users. The rapid growth of the Internet is due, in large part, to the introduction and widespread use of graphical user interfaces called browsers which allow users easy access to network servers and computers connected to the Internet and, more particularly, the World Wide Web.

The World Wide Web forms a subset of the Internet and includes a collection of servers, computers, and other devices. Each server may contain documents formatted as web pages or hypertext documents that are accessible and viewable with a web compliant browser, such as the Netscape Navigator™ browser or the Mosaic™ browser. Each hypertext document or web page may contain references to graphic files or banners that are to be displayed in conjunction with the hypertext document or web page. The files and banners may or may not be stored at the same location as the hypertext document or web page.

A hypertext document often contains hypertext links to other hypertext documents such that the other hypertext documents can be accessed from the first hypertext document by activating the hypertext links. The servers connected to the World Wide Web utilize the Hypertext Transfer Protocol (HTTP) which is widely known protocol which allows users to use browsers to access web pages and the banners or files associated with web pages. The files, banners, hypertext documents, or web pages may contain text, graphics, images, sound, video, etc. and are generally written in a standard page or hypertext document description language known as the Hypertext Markup Language (HTML). The HTML format allows a web page developer to specify the location and presentation of the graphic, textual, sound, etc. on the screen displayed to the user accessing the web page. In addition, the HTML format allows a web page to contain links, such as the hypertext links described above, to other web pages or servers on the Internet. Simply by selecting a link, a user can be transferred to the new web page, which may be located very different geographically or topologically from the original web page.

When using a conventional browser, a user can select which web page or hypertext document the user wishes to have displayed on the user's computer or terminal by specifying the web page's Universal or Uniform Resource Locator (URL) address. Each server has a unique URL address and, in fact, so does each web page and each file needed to display the web page. For example, the URL address for the U.S. Patent and Trademark Office is currently http://www.uspto.gov. When a user types in this URL address into a browser, the user's terminal establishes a connection with the U.S. Patent and Trademark Office and the initial web page for the U.S. Patent and Trademark Office is transmitted from the server storing this web page (which may or may not be actually located at the U.S. Patent and Trademark Office) to the user's terminal and displayed on the user's terminal. The web page may include a number of graphic images or elements, often referred to as banners, which are to be displayed on the user's terminal in conjunction with the web page. Each of the graphic images is typically stored as a separate file on the server and has its own URL address. When the web page is initially transmitted from the server to the user's terminal, the browser receives the URL addresses for the graphic images and then requests that they be transmitted from the server on which they are stored to the user's terminal for display on the user's terminal in conjunction with the web page. The server(s) on which the graphic images are stored may or may not be the same server on which the original web page is stored. More specifically, since the URL's addresses for the included graphic images are all processed separately using the HIML protocols, it is possible and, in fact, common, for these graphic images to be stored on separate and even widely distributed computers or hosts, all of which are accessible to the user's terminal via a computer network. For purposes of the present invention, the term "banner" is meant to be construed very broadly and includes any information displayed in conjunction with a web page wherein the information is not part of the same file as the web page. That is, a banner includes anything that is displayed or used in conjunction with a web page, but which can exist separately from the web page or which can be used in conjunction with many web pages. Banners can include graphics, textual information, video, audio, animation, and links to other computer sites, web sites, web pages, or banners.

The growth of easy access to the World Wide Web and the ability to create visually pleasing web pages have helped increase the amount of advertising and other promotional materials created for use and display with web pages. For example, a car manufacturer may have a web page describing the company and the cars and car parts that the company manufactures and sells. Part of the web page may include advertising information or banners such as, for example, images of current car models sold by the manufacturer or the types and numbers or cars the manufacturer has in stock. The car manufacturer may also contract with the owners or operators of other web pages to have the car manufacturer's advertisement banners displayed when users access these other web pages. Similarly, an advertising agency may contract with various web sites to have the advertisement banners of the agency's clients displayed when users access the web pages stored on the web sites. For example, an advertising agency or ad-network firm may contract with a web site containing general information about cars to have advertising information or banners included on the web pages displayed to a user accessing the web site. The advertising banners may contain graphics, text, etc. about car models or car parts manufactured by on of the advertising agency's clients. Furthermore, the advertisement banners may not be stored on the same server or computer or web site on which the web page is stored. Rather, all or a significant portion of the advertisement banners created by an advertising agency may reside on one or more information or ad servers. Typically, an advertising agency will pay a fixed amount of money for a fixed number of displays of

its advertisement banners on a single web page or group of web pages. Therefore, advertising agencies are understandably very interested in knowing which advertisement banners have been displayed with which web pages and how often each advertisement banner has been displayed on terminals or otherwise served to terminals.

Unfortunately, the current state of the art is such that accurate counts are not made of how many times an banner, even a banner containing an advertisement, is displayed to users or served to terminals. Furthermore, nature and extent of the problem of miscounting displays of banners is not well-known or even understood in the industry or by people of ordinary skill in the art. Therefore, despite the well-developed state of the art in the displaying of information, banners, and advertisements in conjunction with web pages, documents, or other information, there is still a need for a system for storing and delivering information and banners on a computer network where accurate counts of the number of times each piece of information and banner is displayed can be made and the information and banners are displayed quickly and efficiently to users or terminals. In addition, there is a need for a highly reliable, even fault-tolerant, system for storing and delivering the information and banners that will not significantly reduce the efficiency of the Internet or the servers on which the information and banners are stored, while providing for accurate monitoring and counting of the information and banners displayed to a user or served to a terminal.

SUMMARY OF THE INVENTION

Accordingly, it is a general object of the present invention to provide a system for storing and delivering information on a computer network.

It is a specific object of the present invention to provide a system for the storage, delivery monitoring, and tailoring of advertising information on a computer network.

It is another general object of the present invention to provide a system for storing and delivering information on a computer network wherein accurate counts of the number of times the information is displayed or served to users or terminals can be made.

It is a specific object of the present invention to provide a system for storing and delivering information on a computer network wherein the operation of the computer network is not significantly affected.

It is another general object of the present invention to provide a system for storing and delivering information on a computer network wherein the system maintains a high degree of reliability and fault tolerance.

Additional objects, advantages, and novel features of the invention shall be set forth in part in the description that follows, and in part will become apparent to those skilled in the art upon examination of the following or may be learned by the practice of the invention. The objects and the advantages may be realized and attained by means of the instrumentalities and in combinations particularly pointed out in the appended claims.

To achieve the foregoing and other objects and in accordance with the purposes of the present invention, as embodied and broadly described herein, the system includes terminals connected to a computer network, either directly, or indirectly through an intermediary device such as a local or proxy server, that access computer or web sites also connected to the computer network to download or transmit pages, documents, or other information from the computer or web sites for storage or display on the terminals, wherein the pages, documents, or other information served to the terminals contain references to banners to be displayed in conjunction with the pages, documents, and information. The terminal initiates access or connection to a desired computer or web site to access a desired page. After the desired page is transmitted and served to the terminal from the computer or web site, the terminal initiates and sends an initial banner request signal to an information server either requesting that unspecified banner be served to the terminal or that a specified banner be served to the terminal. The information server returns a redirect signal to the terminal telling the terminal the location on the computer network of the banner requested or specified by the terminal or selected by the information server, which location may be the information server, the computer site, or some other information server, computer site, or location accessible to the terminal via the computer network. The terminal then initiates a second specific banner request signal to the location of the banner requested or specified by the terminal or selected by the information server and the banner is transmitted to the terminal for display on the terminal, unless the requested or selected banner has previously been stored or cached in the terminal's memory or in the memory of a local or proxy server connected to the terminal, in which case the second banner request signal is not sent across the computer network and the banner is loaded and/or displayed directly from the terminal's memory or served to the terminal from the proxy server.

In a second embodiment, a primary information server and at least one mirror information server are connected to the computer site, but may be separated either geographically or network topologically. The banner information stored in the primary information server is also stored in each of the mirror information servers. All of the initial banner request signals are sent to the primary information server which determines which information server is best suited for delivering the banner to the terminal sending the initial banner request signal. As in the first embodiment, the banner may be specifically requested by the terminal or may be selected by the primary information server. The primary information server then sends a signal to the terminal indicating to the terminal which information server the terminal should request the requested or selected banner from. The terminal then generates the second banner request signal to serve or transmit the banner from the information server selected by the primary information server. Should the primary information server go offline, one or more of the mirror information servers can become a new primary information server.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated in and form a part of the specification, illustrate the preferred embodiments of the present invention, and together with the descriptions serve to explain the principles of the invention. In the Drawings:

FIG. **1** illustrates a computer network over which the present invention can be implemented;

FIG. **2** shows an representative web page accessible from a computer site connected to the computer network of FIG. **1**;

FIG. **3** shows a flowchart diagram of a prior method for storing and delivering information across the computer network of FIG. **1**; and

FIG. **4** shows a flowchart diagram of the preferred method of the present invention for storing and delivering information across the computer network of FIG. **1**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

A representative computer network **30** is illustrated in FIG. **1** and includes computers or terminals **32, 34, 36, 38, 40, 42, 44** with which users can access or connect to the computer network **30** and the resources connected to the computer network **30** such as the computer or web sites or servers **46, 48**. The computer network **30** can include satellite links, microwave links, fiber optic transmission lines, local area networks, wide area networks, etc. Terminals, such as the terminals **36, 38, 40, 42, 44**, may be connected to the computer network **30** via local or caching proxy servers **50, 52** or other intermediary devices (not shown). Proxy servers allow multiple terminals to access the computer network **30**, while reducing the number of physical connections to the computer network **30**, as will be discussed in more detail below. A primary information server **54** and mirror information servers **56, 58** may also be connected to the computer network **30** to facilitate the serving and displaying of information or banners to the terminals **32, 34, 36, 38, 40, 42, 44**, as will also be discussed in more detail below. The computer network **30** illustrated in FIG. **1** is only meant to be generally representative of computer networks for purposes of elaboration and explanation of the present invention and other devices, networks, etc. may be connected to the computer network **30** without departing from the scope of the present invention. The computer network **30** is also intended to be representative of, and include, the Internet, the World Wide Web, privately or publicly owned or operated networks such as, for example, Tymnet, Telenet, America On-Line, Prodigy, Compuserve, Information America, and the Microsoft Network, and other local or wide area computer networks. The computer network **30** can also include or be representative of corporate or other private intranets, which are privately owned networks using Internet protocols. It should also be noted that the distinction between information servers, web site, computer sites, and generic servers is made only for the purposes of elaboration and explanation of the present invention and that a device can function simultaneously or alternatively as a computer site, web site, information server, generic server, or other device, or combinations thereof without falling outside the scope of the present invention.

By way of general introduction, in a typical computer network, a user located at a terminal can access the resources connected to the computer network. For example, a user at the terminal **34** or terminal **36** can access the web site or computer site **46** and the information stored thereon. The computer site or server **46** may contain web pages, such as the web page **60** illustrated in FIG. **2**, that the user can download for display on the terminal **34**. For purposes of this invention, the term "web page" shall be defined broadly and will include any hypertext document, information, screen displays, etc. that a user can download or otherwise retrieve from a computer or web site for display and/or storage on the user's terminal, and shall not be limited to only the information, pages, or documents retrievable by a user connected to the World Wide Web. Therefore, the term "web page" will be used generically to refer to information transmitted or served to a terminal from a computer site, web site, server, or other device, wherein the web page may contain banners or references to banners that can be served to the terminal and displayed in conjunction with the web page. The web page **60** may contain textual information, such as "XYZ COMPANY" and "Company History," and information configured in banners, such as the banners **62, 64, 66**. The banners **62, 64, 66** may contain graphics, text, video, etc. As will be discussed in more detail below, the banners associated with a web page may not be stored at the same place as the web page and may be downloaded or served to a user's terminal separately from the web page. A significant feature and advantage of the present invention is in the way the banner information is selected and downloaded or served to a user's terminal from computer sites or information servers connected over a same computer network, as will be discussed in more detail below. The current state of the art is such that the counts of banner displays are largely inaccurate, banners are not targetable to large segments of the population using caching proxy servers, and suffers when the performance gains provided by proxy servers are not taken into account in prior art methods of counting banner displays, as will also be discussed in more detail below.

In a conventional web page, such as the web page **60**, if a user clicks on, or otherwise activates, the button associated with the textual information, a new web page might be displayed on the user's terminal. For example, if the user clicks on the button **68** associated with the textual information "Company History," a new web page devoted to the history of the XYZ company might be served from the computer site **46** to the user's terminal **34** and displayed on the user's terminal **34**. Similarly, if the user clicks on the button **70** associated with the textual information "Product Line," a new web page devoted to the product line of the XYZ company might be served from the computer site **46** to the user's terminal **34** and displayed on the user's terminal **34**. Each web page may contain similar "links" to other web pages, hypertext documents, web sites, etc. Activating a link available on a web page or hypertext document, therefore, provides the user with an ability to navigate or move to and display or download different documents, pages, banners, sites, or other information via the computer network **30**.

When a user has a web page displayed on the user's terminal, the web page and its associated banners are often stored or cached in the terminal's memory for a period of time. In this fashion, if the user desires or requests that a web page previously displayed to the user on the terminal be reaccessed and displayed on the user's terminal, the web page and the banners associated with the requested web page can be loaded directly from the terminal's memory without reconnecting to the computer or web site on which the web page is stored and from which the web page was originally served and without reconnecting to the computer site or information server on which the banners are stored and from the banners were originally served, thereby reducing the time needed to display the web page. Similarly, if the user's terminal is connected to a local or proxy server, the web page and the banners associated with the web page may be stored in the memory of the proxy server. Should the user at a terminal request a redisplay of a web page previously displayed on the user's terminal or previously displayed on any other terminal connected to the same proxy server, the web page and the banners associated from the web page can be served from the proxy server to the terminal for display on the terminal without connecting to the computer or web site on which the web page is stored and from which the web page was originally downloaded or served and without connecting to computer site or information servers on which the banners are stored and from which the banners were originally transmitted or served. Note that, in the case that the information is retrieved from a copy of the information previously stored held within a proxy server connected to the terminal, the serving of the information to the terminal will typically be completed by sending the information from

the proxy server to the terminal, i.e., without the participation of the computer site or server. Therefore, it is difficult for the computer site or server **46** to maintain an accurate count of the terminals **36**, **38**, etc. on which the information is displayed if the terminals are connected to caching proxy servers, if the performance benefits offered by the caching proxy server are desired.

As previously discussed above, a significant feature and advantage of the present invention is in the way the banner information is selected and transmitted and served to the user's terminal from computer sites or information servers connected over a same computer network. More specifically, the method of the present invention allows banner information to be served over a computer network to a terminal, computer, etc. in a way which takes advantage of the performance enhancements offered by caching proxy servers and such that the operation of the computer network is not significantly affected while providing the ability to accurately track or count the number of times the banner information has been displayed on terminals connected to the computer network, as will be discussed in more detail below. It is not uncommon for banners to contain up to fifty kilobytes (KB) of information, thereby making the limiting of banner transmissions across a computer network very significant to the efficiency and operation of the computer network and to banner serving computer systems.

For purposes of elaboration and explanation of the present invention, the conventions and protocols of the World Wide Web, and browsers therefore, will be used as examples, in particular, the concept of a Uniform Resource Locator (URL), the Hypertext Transfer Protocol (HTTP), the Hypertext Markup Language (HTML), and the Transmission Control Protocol/Internet Protocol (TCCP/IP). It should be noted, however, that the concepts underlying the present invention can be used for computer networks using other or different types of conventions and protocols. For more details on these protocols, the reader is directed to: Kevin Washburn and Jim Evans, *TCP/IP running a successful network*, *2nd Ed.* (1996), published by Addison-Wesley, Douglas E. Comer, *Internetworking with TCP/IP*. *3rd Ed.* (1995), published by Prentice Hall, John December and Mark Ginsberg, *HTML* 3.2 *and CGI Unleashed Professional Reference Edition* (1996), published by Sams.net Publishing, and Jerry Honeycutt et al., *Using HTML* 3.2 *3rd Ed* (1997), published by Que Corporation, all of these references of which are incorporated herein by reference. Other information about the HTTP, HTML, TCP/IP and other network protocols can also be found in U.S. Pat. No. 5,617,540 issued to Civanlar et al., U.S. Pat. No. 5,572,643 issued to Judson, and U.S. Pat. No. 5,442,771 issued to Filepp et al., all of which are also incorporated herein by reference. The linking of one web page or hypertext document to another is commonly done using a hypertext markup comment tag. When the user clicks on or otherwise activates the hypertext markup comment tag, a link to the new web page or hypertext document is generally initiated by the user's browser software which causes the user's terminal to request that the new web page or hypertext document be displayed on the user's terminal or computer. Similarly, if a web page served to a user's terminal contains banners, the URL addresses for the banners will be served with the web page so that the terminal can request that the banners be served to the terminal for display on the terminal along with the previously served web page.

It should also be noted that the disclosed system and method also work for all types of operating systems running on the computers, terminals, computer sites, information servers, and other devices connected to the computer network **30**. Such operating systems can include, for example, Microsoft's DOS™, WINDOWS 3.x™, WINDOWS NT™, or WINDOWS 95™ software, IBM's OS/2™ software, Apple's System 7™ software, or the AIX or UNIX operating system software platforms.

Now referring back to FIG. **1**, computers or terminals can be connected to the computer network **30** in a variety of ways. For example, the terminals **32**, **34** can be connected directly to the computer network **30** or may be attached via a dial-up line or network access service provider. Other terminals may connected to the computer via network proxy or local servers, such as the proxy servers **50**, **52**. Proxy servers allow multiple computers, terminals, or computer networks to be connected to another computer network at a single point. In addition, since the connection from the terminals **32**, **34** and the proxy server **50** to the computer network **30** is in most instances slower than the connections from the terminals **36**, **38** to the proxy server **50**, the proxy server **50** can provide significant speed improvements. For example, a large corporation may have all its terminals connected via a local area computer network. The local area computer network can be connected to a caching proxy server which is, in turn, connected to the computer network **30**. In the computer network **30** illustrated in FIG. **1**, the terminals **36**, **38** access the computer network **30** through the proxy server **50**. Similarly, the terminals **40**, **42**, **44** access the computer network **30** through the proxy server **52**. Using proxy servers allows multiple computers or terminals to access a computer network while limiting the number of physical connections to the computer network. Unfortunately, the use of proxy or network servers also creates some serious problems when the counting of banner information files displayed to users on terminals is desired, as will be discussed in more detail below.

As previously discussed above, the connection of computer sites, web sites, information servers, terminals, and other devices to a computer network allows the resources and information stored in the computer sites, information servers, and other devices to be accessible to users at the different terminals connected to the computer network. The users can also communicate with each other or the computer sites by sending messages or e-mail. When a user accesses the information stored at a computer site, information, web pages, or screen displays are generally served from the computer site for display on the user's terminal or computer. The information transmitted to the user's terminal may contain a banner which is also served from the computer site, or which may be instead automatically served from other computer sites or information servers connected to the computer network. As a general example, referring once again to FIG. **1**, suppose a user at the terminal **36** accesses the web site or computer site **46** via the proxy server **50** and the computer network **30** in order to obtain information about the hypothetical XYZ Company. A web page about the XYZ Company, such as the web page **60** illustrated in FIG. **2**, may be served from the computer site **46** to the terminal **36** and displayed on the user's terminal **36**. The web page **60** may contain places for banner information, such as the banners **62**, **64**, **66** illustrated in FIG. **2**. When the web page **60** is received by the user's terminal **36**, the banners **62**, **64**, **66** may be received at the same time. Alternatively, instructions may be sent to the user's terminal **36** from the computer site **46** telling the terminal **36** where to find and request the banners **62**, **64**, **66** on the computer network **30**, which may be the computer site **46**, another computer site, or an information server such as the information servers **54**,

56, 58. When such instructions are received by the user's terminal 36, the terminal 36 accesses the appropriate location of banners 62, 64, 66 via the computer network 30 and requests that the banners 62, 64, 66 be served for display on the user's terminal 36.

The process described above in relation to the example has many inherent problems, particularly when it is desired to count the number of times banner information is displayed on the user's terminal. More particularly, with reference to the previous example, the banners 62, 64, 66 displayed on the user's terminal may or may not be related to the XYZ Company. Regardless of the relationship between the banners 62, 64, 66 and the XYZ Company, the XYZ Company, an advertising agency, or some other entity may wish to know how many times the banners 62, 64, 66 have been displayed on users' terminals. As a more specific example, suppose the banners 62, 64, 66 constitute advertisements. The advertiser and the company or client for whom the advertisements are created will be very interested in knowing how many times the advertisements are displayed on users' terminals. Therefore, accurate count information for the banners 62, 64, 66 is highly desirable. Unfortunately, such accurate count information is very difficult to acquire, as will now be discussed in more detail.

Now referring to FIG. 3, a conventional method 72 used to download or serve web pages and banner information to a user's terminal is illustrated. Using the examples discussed above, a user at the terminal 36 can access the computer site 46 via the computer network 30 and request a web page to be served from the computer site 46 to the terminal 36 during the request page step 74. When the user requests a page during the request page step 74, a signal is sent from the user's terminal 36 to the computer site 46 via the proxy server 50 and the computer network 30 telling the computer site 46 which page stored on the computer site 46 the user desires to have displayed on the user's terminal 36. However, the request signal sent by the user's terminal 36 during the request page step 74 may not reach the computer site 46. If the user at the terminal 36 had previously requested the same page from the computer site 46, the page may already be stored in the user's terminal 36. Similarly, if any users at the terminals 36, 38 had requested the same page from the computer site 46, the page may be stored in the proxy server 50. After the user requests a page during the request page step 74, the terminal 36 may determine if the desired page is already stored in the terminal 36 during storage determination step 76. If the desired page is already stored in the terminal 36, the terminal 36 will display the page during display step 78 without sending the signal to the computer site 46. If the desired page is not already stored in the terminal 36, the terminal 36 will send the page request signal during send page request step 80. Since the terminal 36 is connected to the proxy server 50, the page request signal sent during step 80 must pass through the proxy server before reaching the computer network 30. As a result, the proxy server 50 may determine if the desired page is already stored in the proxy server 50 during storage determination step 82 before it sends any signal to the computer site 46 over the computer network 30. If the desired page is already stored in the proxy server 50, the proxy server 50 can stop or otherwise terminate the page request signal, thereby stopping the page request signal from being received by the computer site 46, and the proxy server will serve the desired page directly to the terminal 36 for display on the terminal 36 during serve requested page step 84. The terminal 36 may also store the desired page in its own memory during the serve requested page step 84. If the proxy server 50 does not have the desired page already stored in its own memory, the proxy server 50 will send the page request signal to the computer site 46 over the computer network 30 during send page request step 85. The computer site 46 will then serve the desired page to the proxy server 50 and the terminal 36 for display on the terminal 36 during the serve requested page step 86. Either or both the terminal 36 and the proxy server 50 may store the desired page during the serve requested page step 86.

Since terminals may be connected to the computer network 30 without also being connected to proxy servers, the steps 82, 84, and 85 may not always be necessary in the method 72. For example, now referring to FIG. 1, the terminal 34 is not connected to a proxy server but is connected to the computer network 30. Therefore, the steps 82, 84 in the method 72 are not needed and the terminal 34 will send the page request signal via the computer network 30 directly to the computer site 46 during the send page request signal step 80.

The web page requested by the user from the computer site 46 may contain banner information, such as the banners 62, 64, 66 in the web page 60 illustrated in FIG. 2. The banner information may be served with the web page or, more commonly, the banner information may reside in separate files which will need to be requested by the user's terminal 36 before the banner information can be displayed on the user's terminal 36 along with the requested web page. Typically, the web page information served to the terminal 36 for display on the terminal 36 will contain the electronic address information containing the location of the banner information on the computer network 30. The banner information may be located on the computer site 46 or at other locations connected to the computer network 30, as will be discussed in more detail below.

The terminal 36 will determine during banner determination step 88 if the page served to the terminal during steps 78, 84, or 86 contains banner information not already included in the web page displayed on the terminal 36. If the answer is no, i.e., the web page served to the terminal 36 is complete, the process is ended. If the answer is yes, i.e., the page served to the terminal 36 is not complete and contains banner information that needs to be served to the terminal 36, the terminal 36 requests the banner during request banner step 90.

Similar to the process described above for service of the desired page to the terminal 36, the terminal 36 first determines if the requested banner is already stored in the memory of the terminal 36 during banner storage detention step 92. The banner storage determination step 92 can occur in conjunction with the banner request step 90 such that no signal is generated by the terminal 36 if the requested banner is already stored in the terminal 36. If the requested banner is, in fact, already stored in the memory of the terminal 36, the terminal 36 will display the requested banner during display banner step 94 and the process is over. If the requested banner is not already stored in the memory of the terminal 36, the terminal 36 will generate and send a banner request signal during send banner request signal step 96. The request banner signal sent during the step 96 contains the address of the location of the desired banner so the computer network 30 can properly locate the desired banner.

Since the terminal 36 is connected to the proxy server 50, in a similar manner as described above in relation to steps 82, 84, 85, 86, once the proxy server 50 receives the banner request signal from the terminal 36, the proxy server 50 will determine whether or not the desired banner is already

stored in the memory of the proxy server **50** during banner storage determination step **98**. If the desired banner is already stored in the memory of the proxy server **50**, the proxy server **50** will transmit and serve the banner directly to the terminal **36** for display by the terminal **36** during serve banner step **100**. The terminal **36** may also store the banner in its own memory during the serve banner step **100**. If the requested banner is not already stored in the proxy server **50**, the proxy server will send the banner request signal to the device on which the requested banner is stored via the computer network **30** during the send banner request signal step **102**. The device on which the requested banner is stored will then download or serve the requested banner to the proxy server **50** and the terminal **36** during the serve banner step **104** for display by the terminal **36**. Either or both the terminal **36** and the proxy server **50** may store the banner served by the device on which the requested banner is stored during the serve banner step **104**.

The steps **98**, **100**, and **102** will not be necessary if a terminal requesting the banner information is not connected to a proxy server. For example discussed above, since the terminal **34** is not connected to a proxy server, the steps **98**, **100**, and **102** are not needed for the terminal **34** and the terminal **34** will send the page request signal via the computer network **30** directly to the server on which the requested banner is stored during send banner request signal step **102**.

When the computer site **46** in the example described above in relation to FIG. **3** is a web site using the HTTP and HTML protocols, the user selects and accesses the web site **46** by entering the Uniform Resource Locator (URL) address of the web site **46** into the terminal **36**. The page request signal generated by the terminal **36** during step **74** tells the computer network **30** and the equipment associated with the computer network **30** which computer site the user wishes to access. Each computer and device attached to the computer network **30** will have its own unique URL address and each page and file stored in each computer will usually also have its own URL address so that each page and file can be made accessible to users via the computer network **30**. For example, if the user desires to access the web page **60** for the XYZ company, the user may enter the URL address for the web page **60**, http://www.xyzcompany.com, into the browser software operating on the user's terminal. The URL address contains an alphanumeric portion or domain name, "www.xyzcompany.com" that identifies the web site in an easy to understand and remember format. Each computer or web site and other host devices, end systems, networks, or network router devices connected to the computer network **30**, however, has a unique Internet Protocol (IP) address that is thirty-two bits in length and is generally written as four decimal numbers in the range zero (0) through 255, separated by periods. For example, an IP address could be 128.10.2.30 which in its full thirty-two bit format is 10000000.00001010.00000010.00011110. Providing every host computer on a computer network with a unique IP address allows any host computer to communicate with any other host computer.

By a process known as domain name resolution or by the use of Domain Name System (DNS), the IP address of the computer or web site on which XYZ Company's web page **60** and the web page **60** are stored can be determined from the domain name provided in the URL address. In fact, the IP address for computer or web site must first be determined when an URL address is entered by the user at a terminal that does not contain the IP address. For example, if a user at a terminal or computer enters the alphanumeric domain name address, i.e., http://www.xyzcompany.com, the alphanumeric domain name must be resolved by the Domain Name System to a specific IP address, i.e., http:/1019.247.56.38, before the designated and desired computer containing the web page **60** for the XYZ Company can be accessed. If the user enters the specific IP address directly, then use and access of the Domain Name System is not required. If resolution or determination of an IP address is required, the name server will return the appropriate IP address to the terminal which generated the signal in which the IP address was not included. The use and operation of domain name resolution and the Domain Name System for determining IP addresses are well known to people of ordinary skill in this art and need not be explained in any further detail for purposes of the present invention.

When the web page requested by the user during page request step **74** is served to the terminal **36** during steps **78**, **84**, or **86**, the web page will often contain the URL addresses of banners or banner information to be displayed along with the web page on the user's terminal **36** instead of the banner information itself. The terminal **36** will then use the URL addresses of the desired banner information to access the computer network **30** and request that the desired banner information be served to the terminal **36** for display on the terminal **36**. For example, when the web page **60** for the XYZ company is served to a terminal, the web page may contain URL addresses for the banners **62**, **64**, **66**. The URL address for the banner **62** may be of the form http://www.bannersite1.com/banner1.gif. The "banner site1.com" portion of the URL address for the banner **62** indicates which device, for example the information server **54**, connected to the computer network contains the requested banner **62** where the "banner1.gif" portion of the URL address for the banner **62** indicates which file stored on the indicated device constitutes the banner **62**. Similarly, the URL address for the banner **64** may be of the form http://www.bannersite2.com/banner54.gif. The "banner site2.com" portion of the URL address for the banner **64** indicates which device, for example the information server **56**, connected to the computer network contains the requested banner **64** where the "banner54.gif" portion of the URL address for the banner **64** indicates which file stored on the indicated device constitutes the banner **64**. As shown by these examples, the banner **62** may not be stored on the same device as the banner **64**. In addition, as previously discussed above, the banners **62**, **64** may be located on the same web site as the requested page or may be located on other web or computer sites, such as the computer or web site **48** shown in FIG. **1**, or on information servers, such as the information servers **54**, **56**, **58** shown in FIG. **1**. When the terminal **36** requests the banner information during step **96**, the banner request signal will contain the URL addresses for each banner to be displayed with the web page so that the banners can be located at, and served from, the appropriate devices on the computer network **30**.

The prior are method **72** discussed above and illustrated in FIG. **3** has many inherent problems, however, which make it unsuitable for counting the number of times a banner is displayed on the terminals connected to the computer network **30**, as will now be discussed in more detail. Since the web page, and the banners to be displayed with the web page, selected by the user can be stored in either the user's terminal or the proxy server connected to the user's terminal, not all requests for the banner information are forwarded by the user's terminal or respective proxy server and transmitted over the computer network **30**. While this result may appear to be beneficial in that the amount of data traffic on

the computer network **30** is reduced, in fact, this result prevents the accurate count of banner displays. More specifically, entities such as advertising agencies, advertising repping firms, and the entities hiring them want to count and know each time a banner is displayed on a user's terminal so that the success or failure of various advertising banners can be determined and so that the correct payment for the display of the advertising banners can be computed. There are two conventional ways in which the number of times a banner is displayed is counted. The first way is to count the number of times an information server or computer site serves a page during the step **86**. The second way is to count the number of times that the information server actually serves a banner during the step **104**. Unfortunately, a page requested by a terminal during the step **74** is already stored on either the terminal or a proxy server connected to the terminal, the display of the banner on the user's terminal is not counted under the first method. Similarly, if a banner requested by a terminal during the step **90** is already stored on either the terminal or a proxy server connected to the terminal, the display of the banner on the user's terminal is not counted under the second method. The discrepancy between the number of times a banner is actually displayed on a user's terminal and the number of times the display of the banner on the user's terminal is counted can become significant, even reaching error rates of eighty percent or higher.

One solution to the problem is to prevent banner information from being stored or cached on either the user's terminal or the proxy server to which the user's terminal is attached. Therefore, each time a banner is requested by the user's terminal, the banner will have to be downloaded or served from the computer site or information server on which the banner is stored to the user's terminal for display on the user's terminal. For example, the HTTP and HTML protocols allow banners to be tagged or indicated as being uncachable or unstorable at the user's terminal or the proxy server connected to the user's terminal, as will be discussed in more detail below. Therefore, such a solution can be implemented where after each request for banner information, the requested banner information is served from the location storing the banner information, thereby allowing the display of the banner information to be counted accurately at the location at which the requested banner information is stored.

The solution described in the preceding paragraph creates a significant problem, however, that creates even more significant consequences, thereby making its use for accurately counting advertisement and banner displays highly impractical and undesirable. More specifically, the storage of web pages and banner information at the user's terminal or in the proxy server conned to the user's terminal provides several important benefits that will be eliminated by this simple solution. First, the speed at which the information is displayed on the user's terminal will be reduced since the information will always have to be transmitted or served to the user's terminal for display on the user's terminal each time the user requests the information. If the information had previously been requested by the user such that the information was already stored in the user's terminal or the proxy server connected to the user's terminal, or if the information had previously been requested by a second user at a terminal connected to the same proxy server as the first user's terminal such that information was already stored in the proxy server connected to the first user's terminal, re-requesting the information to be downloaded or served from another device connected to the computer network and the actual serving of the information to the user's terminal will take substantially longer than loading the information already stored in the user's terminal or serving the information to the user's terminal only from the proxy server to which the user's terminal is connected. If the banners contain advertisements, the length of time the banner is displayed to the user may also be critically important to the advertiser. The user may not wait for the banner information to be served and displayed before the user selects another web page, thereby minimizing the success of the banner.

A second and more serious problem created by having to serve the information displayed on the user's terminal each time the information is requested is that the amount of data traffic on the computer network will significantly increase, and can even bring the flow of information to a virtual stop, particularly if all requests for banner information from any terminal connected to the computer network require the information to be transmitted across the computer network to the terminal.

A third problem created with the prior art method **72** is that the step **100** eliminates any possibility of targeting specific information to be displayed with specific web pages. That is, if any demographic or other information about the user or terminal **36** is known by the server on which the banners are stored, the prior art method **72** prevents the server from using the demographic or other information to target the user with a specific banner or to tailor a banner to the specific user. Such targeting or tailoring of banners can be very important when the banners contain advertising information and the advertisers want to send specific advertisement banners to users about whom specific demographic or other information is known.

The method **110** of the present invention solves the initial problem of how to create accurate counts of banner information displays on user terminals while avoiding the problems created by requiring the banner information to be retransmitted across the computer network each time the banner information is requested by a user or a user's terminal, as will now be discussed in more detail in reference to FIG. **4**. In addition, the method **110** allows for the use of content general and content specific signals, which allow banner displays to be targeted to specific users while taking advantage of the performance gains possible with caching proxy servers, as will also now be discussed in more detail in reference to FIG. **4**.

In the method **110**, the steps **74**, **80**, **82**, **84**, **85**, **86**, and **88** are essentially the same as described above in relation to the prior art method **72** illustrated in FIG. **3**. Therefore, no further discussion of these steps is required for purpose of explanation of the method **110** of the present invention. After a requested page containing a banner has been displayed on a user's terminal during the steps **78**, **84**, or **86**, and, as determined during banner determination step **88**, if the page contains banners to be displayed on the user's terminal **36** along with the page, an initial request banner signal is generated by the user's terminal **36** during initial banner request step **112**. Unlike the previous situation with the method **72**, however, the terminal **36** and the proxy server **50** preferably do not check to see if the banner information has already been stored and the terminal **36** and the proxy server **50** preferably cannot stop the initial banner request signal sent by the terminal **36** during the step **112** from being transmitted across the computer network **30**. That is, the initial banner request signal sent by the terminal **36** during the step **112** is preferably a mandatory signal to be transmitted across the computer network **30** and that cannot be blocked or terminated by either the terminal **36** or the proxy

server **50**, even if the banner to be served to the terminal **36** is already stored in either the terminal **36** or the proxy server **50**.

The initial banner request signal generated by the terminal **36** during the step **112** preferably does not contain the location information of the desired banner as does the banner request signal generated by the terminal **36** during the request banner step **90** of the prior art method **72**. In other words, the initial banner request signal generated by terminal **36** during the step **112** can be a content general signal and may contain only the minimum amount of information needed to tell a designated computer site, information server, or other device which receives the initial banner request signal and on which a banner may or may not be stored or located, only that the terminal **36** desires that an unspecified banner be served to the terminal. The designated computer site, information server, or other device can then select which banner is to be served to the terminal **36**. The process of selecting which banner is to be served to the terminal **36** can be made during the optional banner selection step **113**, which would occur after the step **112** and before the step **114** in the method **110** illustrated in FIG. **4**. If the optional selection step **113** is not used with the method **110**, the terminal **36** will request during the step **112** that a specific banner to be served to the terminal **36**. If the optional selection step **113** is used with the method **110**, the terminal **36** will only request during step **112** that a banner be served to the terminal **36**, but the terminal **36** will not specify which banner is to be served to the terminal **36**.

Since the designated computer site, information server, or other device should, barring any problems with the computer network **30**, always receive the initial request banner signal from the terminal **36** sent during the step **112**, the display of the banner on the user's terminal **36** can always be counted and monitored. Instead of returning or serving a banner to the terminal **36**, however, the designated computer site, information server, or other device will usually return or send a banner location signal to the terminal **36** during return banner location address step **114** specifying the location address of the banner requested by the terminal **36** (if the optional step **113** is not used) or the banner selected by the designated computer site, information server, or other device (if the optional step **113** is used), to be served to the terminal **36**. The signals transmitted during the steps **112** and **114** are very short or small since the signals contain only a small amount of information, particularly when compared to a banner which may contain a large amount of information.

Similar to the process described above for service of the desired page to the terminal **36** during step **76**, the terminal **36** first determines if the requested (if the optional step **113** is not used) or the selected (if the optional step **113** is used) banner is already stored in the memory of the terminal **36** during banner storage determination step **92**. If the requested or selected banner is, in fact, already stored in the memory of the terminal **36**, the terminal **36** will display the banner during display banner step **94** and the process is over. If the requested or selected banner is not already stored in the memory of the terminal **36**, the terminal **36** will generate and send a second banner request signal during send second banner request signal step **116**. The second banner request signal sent during the step **116** is essentially the same as the signal sent during the step **96** of the method **72** and, therefore, contains the address of the location of the requested or selected banner so the computer network **30** can properly locate the requested or selected banner.

Since the terminal **36** is connected to the proxy server **50**, in a similar manner as described above in relation to steps **82**, **84**, **86**, once the proxy server **50** receives the second banner request signal from the terminal **36**, the proxy server **50** will determine whether or not the selected banner is already stored in the memory of the proxy server **50** during banner storage determination step **98**. If the selected banner is already stored in the memory of the proxy server **50**, the proxy server **50** will transmit the banner directly to the terminal **36** for display by the terminal **36** during serve banner step **100**. The terminal **36** may also store the banner in its own memory during the serve banner step **100**. If the requested or selected banner is not already stored in the proxy server **50**, the proxy server will send the second banner request signal to the location of the banner on the computer network **30** during the send second banner request signal step **118** in a similar manner to the send banner request signal step **102** in the method **72**. The device on which the requested or selected banner is stored will then download and serve the banner to the proxy server **50** and the terminal **36** during the serve banner step **104** for display by the terminal **36**. Either or both the terminal **36** and the proxy server **50** may store the banner served by the computer site **50** during the serve banner step **104**.

When the computer site **46** in the example described above in relation to FIG. **4** is a web site using the HTTP and the HTML protocols, as previously described above, the user selects and accesses the web site **46** by entering the Uniform Resource Locator (URL) address of the desired web site **46** into the terminal **36**. The page request signal generated by the terminal **36** during page request step **74** tells the computer network **30** which computer or web site the user wishes to access. As previously discussed above, when the requested page is served to the terminal **36** from the web site **46**, it may contain the URL addresses of specific banners to be displayed along with the requested web page, or it may contain the URL addresses in a content general format, i.e., the URL address does not specify exactly which banner is to be served to the terminal **36**, only that a banner is to be served to the terminal **36**. It should be noted that steps **80**, **85**, **112**, **116**, and **118** may also include name resolution of the IP address needed to transmit the signals across the computer network to the designated and desired computer web site or information server and these steps should be construed to include such IP address resolution and the use of the Domain Name System (DNS).

Again using the example of the XYZ Company and the web page **60**, the web page **60** served to the terminal **36** or loaded by the terminal **36** during steps **78**, **84**, or **86** may include general content URL addresses for banners or specific content URL addresses for the specific banners **62**, **64**, **66**. A general content URL address for a banner does not provide the necessary information to determine which banner is to be displayed. Rather a general content URL address for a banner only indicates that a banner is to be displayed and the receiver of the signal generated by the terminal **36** during the step **112** can decide which banner is to be displayed during the selection step **113**. A general content URL address for a banner could be of the form http://www.bannersite1.com/image;spacedesc=contentsitename. A server at www.bannersite1.com looks to see if the first word after the name of the site is "image" or any other previously designated word which can be distinguished from an existing file name. It the first word after the name of the site is "image," then the URL address is recognized as a generic request or content general request for a banner, which, as a result, does not specify any particular banner. The server than looks for a space descriptor immediately following the text "spacedesc=" which provides a reference

to a section of the server in which banners are stored or located and from where a specific banner can be selected to be served to the terminal **36**. The space descriptor field in the general content URL address can reference different groups of banners such as, for example, a collection of car advertisements, a collection of detergent advertisements, etc., depending on the web page providing the general content URL address.

A specific content URL address for a banner does contain the necessary information to determine which banner is to be displayed and the location for the banner. As illustrated in the examples above, the specific content URL address for the banner **62** may be of the form http://www.bannersite1.com/banner1.gif. The "bannersite1.com" portion of the specific content URL address for the banner **62** indicates which device, for example the information server **54**, connected to the computer network contains the banner **62** and the "banner1.gif" portion of the specific content URL address for the banner **62** indicates which file stored on the indicated device constitutes the banner **62** and the physical location of the file.

Preferably, the initial banner request signal generated by the terminal **36** during the step **112** is a general content URL address that merely requests a banner to be displayed on the terminal **36**, but does not specify which banner is to be displayed. The recipient of the initial banner request signal can then select which banner is to be displayed on the terminal **36** during the selection step **113**, thereby allowing targeting and variation in the banners displayed, and return a specific content URL address to the terminal **36** during the step **114** in the form of a Status HITTP **302** Redirect (temporary) signal to the terminal **36** to tell the terminal **36** where the selected banner to be displayed on the user's terminal **36** is located on the computer network **30**, i.e., to provide the terminal **36** with the content specific URL address of the selected banner to be displayed on the user's terminal **36**. An HTTP **302** temporary redirect signal does not create an association between the general content URL address signal generated by the terminal **36** during the step **112** and the banner to be displayed on the terminal **36** or the response signal sent to the terminal **36** during the step **114**. Therefore, even though the banner displayed on the user's terminal **36** may be cached or stored on the user's terminal **36** or on the proxy server **50**, the response sent during the step **114** to the general content URL address signal generated by the terminal **36** during the step **112** is not cached. Therefore, the signal sent by the terminal **36** during the step **112** will not be blocked or otherwise prevented from being transmitted over the computer network **30** by either the terminal **36** or the proxy server **50**.

An alternative to using only the HTTP **302** Redirect signal is to use, in addition, standard HTML response header tags. More specifically, every time a server responds to a request for a document or page from a client's browser software, the response from the server can contain one or more response header lines. Each line of the response header describes a different aspect of the response, including its size, the type of content it is (image, text, etc.), a status code, and one or more tags which affect the changing nature of the document and how proxy servers or terminals should deal with the document.

The method **110** of the present invention can use HTML tags to tell proxy servers and terminals that the response sent during the step **114** is not cachable, even if the actual banner eventually served to the terminal is itself cachable. There are many types of tags that can be used for this purpose. For example, the Expiry tag which specifies the date and time beyond which a cached copy of the response is no longer valid. By setting the Expiry tag to a date in the past, the response sent to the terminal **36** during the step **114** will not be considered valid for any further signals sent by the terminal during later steps **112**. Therefore, the response sent to the terminal **365** during a previous step **114** is no longer valid and the signal sent by the terminal **36** during the current step **112** cannot be blocked by the terminal **36** or the proxy server **50**. Another tag that could be used is the Last-Modified Tag which specifies the last time the response was modified. By setting the Las-Modified Tag for a response as a date far in the past, the terminal or proxy server may consider the response to be too "stale" to be considered valid. A third tag that could be used is the Cache-Control Tags or the obsolete pragma:no-cache tag which informs a receiver of the response that the response is not be cached or stored in the receiver.

Another option for implementing the method **110** of the present invention using standard HTML and HTTP protocols is to incorporate variable components into the links on a web page or hypertext document such that the variable components are incorporated into the general content URL addresses sent by the terminal during the step **112**. For example, referring to the web page **60** in FIG. **2**, the hypertext links or URL addresses returned for the banners **62**, **64**, **66** when the web page **60** is displayed on the user's terminal **36** during steps **78**, **84**, or **86** can contain a variable component such as, for example, a random number, a time/date stamp, cgi-bin string, or a random page identifier. In this manner, each time the web page **60** is displayed on the terminal **36**, the URL addresses for the needed banners **62**, **64**, **66** will be different. When the terminal **36** sends the initial banner request signal during step **112**, the initial banner request signal can incorporate the variable component URL addresses generated when the web page **60** is served or displayed on the terminal **36**. Since the variable component URL addresses are, by definition, different every time, the initial banner request signal generated during the step **112** will be different every time, thereby preventing the terminal **36** or the proxy server **50** from blocking the transmission to the computer network **30** of the initial banner request signal generated during the step **112**.

Another alternative for implementing the method **110** of the present invention is to use for the general content URL address, an URL address which, though constant, is interpreted by caching proxy servers and/or caching web browsers or terminals to resemble a constantly changing URL address and, as a result, is not cached. More specifically, caching proxy servers exist which will specifically avoid caching content related to any URL address containing the strings "cgi-bin" and "?" which are strings conventionally used in the construction of URL addresses for which responses are dynmically generated and, therefore, are unsuitable for caching. It should be noted that a general content URL address using this techniques such as, for example, http://www.bannersite1.com/cgi-bin/image;spacedisc=contensitename?variable, need not use the cgi-bin directory and need not use the variable after the "?". Since these markers exist in the URL address, some caching proxy servers will be led to conclude that the URL address should not be cached.

In order to speed up the process of downloading, transmitting, or serving a specific banner from an information server to the terminal **56**, the content specific URL address of the requested or selected banner sent to the terminal during step **114** can contain the exact Internet Protocol (IP) address of the requested or selected banner. For

example, instead of providing the specific content URL address for the banner **62** as http://www.bannersite1.com/banner1.gif, the specific content URL address for the banner **62** could be provided as, for example, http://236.45.78.190/banner1.gif, thereby removing any need to use the Domain Name System (DNS) to convert the alphanumeric address "www.bannersite1.com" of the information server to its exact IP address. The use of content general and content specific URL addresses and IP addressing is well known to people of ordinary skill in the art and need not be explained in any further detail for purposes of the present invention.

The method **110** of the present invention has particular application to the advertising industry, as will now be discussed in more detail. While the previous discussions in regard to the prior art method **72** and the method **110** of the present invention have indicated that the banner information can be located on either the computer or web sites connected to a computer network or information servers connected to the computer network, the conventional practice in the advertising business is to have all of the banners located on one or more information or ad servers, such as the information servers **54**, **56**, **58**. As previously discussed above, advertising agencies create the banners and then arrange or contract to have the banners be associated with web pages or web sites such that when users access the web sites and the web pages are displayed on the user's terminal, the banners are also displayed on the user's terminal. While the advertisements can be stored on the computer or web sites connected to the computer network, it is typically more convenient for the advertisements to be centrally stored on an information or ad server, particularly if the advertisements change or the advertisers want to target specific advertising banners to specific users. Therefore, when a web page requested by the user is served to the user's terminal and the web page contains advertising banners, the web page will often include the address information for the advertising banner to be displayed in conjunction with the requested web page so that the terminal can request the serving of the advertising banners. By keeping the advertising banners centrally located in an information server, the advertiser can keep each advertising banner's address information included in the web page constant while changing the actual advertising banner associated with the banner address information. In addition, the generation of content general URL addresses during the step **112**, the selection of banners to be displayed by a central or primary information server during optional step **113**, and the return of content specific URL addresses during the step **114** allow the advertiser to rotate and change the advertising banners displayed to users. Furthermore, if the device receiving the initial banner request signal generated by a user's terminal during step **112** has any demographic or other information about the user, the use of content general URL addresses and content specific URL addresses in the method **110** allows the device sending the banner location signal during step **114** to select an advertising banner targeted to the particular user during the step **113**, thereby increasing the appeal and success of the advertising banner. In contrast, the prior art method **72** previously discussed above does not utilize content specific and content general URL addressing. Nor does the prior art method allow for the selection or targeting of banners to be made by an information server.

The prior art method **72** also does not allow each display of the banners associated with a page to be counted, while the method **110** of the present invention specifically allows for each such display of a banner to be counted and monitored. More specifically, allowing the user's terminal or proxy server connected to the user's terminal to terminate or block a banner request from the user's terminal (created during step **90**) when the banner is already stored in either the user's terminal or the proxy server connected to the user's terminal in the prior art method **72** prevents accurate banner display counts to be made. In contrast, the method **110** of the present invention specifically allows each banner display to be counted by preventing the user's terminal or the proxy server connected to the user's terminal from terminating or blocking the initial banner request signal (created during step **112**) from reaching the information or ad server in which the desired banner is stored or which is controlling the selection of the banner to be served to the terminal.

In addition to the advantage of the method **1 10** described above, a significant feature of the method **110** of the present invention is that it does not significantly impact the operation or efficiency of the computer network **30**. While the initial banner request signal created by the terminal during the step **112** and the banner location signal generated during the step **114** are additional signals created in the method **110** that are not created in the prior art method **72**, thereby creating additional data traffic and overhead on the computer network **30**, the initial banner request signal and the banner location signal are both extremely small, often comprising no more than a single packet or one-hundred to two-hundred bytes. Therefore, the overhead created by the additional banner signal during the step **112** and the banner location signal during step **114** is negligible. More importantly, since the method **110** still allows the web pages and the banner information to be cached or stored in the terminals and proxy servers, there is no unnecessary retransmission of the web pages or banners from the computer or web sites or the information or ad servers to the terminals which would significantly increase the data traffic and overhead on the computer network **30**.

In a second embodiment of the method **110** of the present invention, multiple information servers storing the banner information used in conjunction with the displays of web pages on user terminals are connected to the computer network. Using mirror information servers allows for banners to be distributed faster to user terminals and increases the reliability of the method **110**. For example, the computer network **30** illustrated in FIG. **1** includes a primary information server **54** and mirror information servers **56**, **58** which preferably contain a duplicate of the banners stored on the primary information server **54**. When the terminal **36** creates and sends the initial banner request signal during the step **112**, the initial banner request signal is preferably configured so that it sent to and received by the primary ad or information server **54** which in turn creates and sends the address location information of a selected banner to the terminal **36** during the step **114**. The selected banner is preferably stored at the primary information server **54** and at also the mirror servers **56**, **58**. The address location information for the banner sent by the primary information server **54** to the terminal during the step **114** is preferably includes the address location for the banner at the information server best suited to handle a transmittal of the banner to the terminal **36** or includes other information with which the terminal **36** can determine the best suited information server to serve the banner. Typically, the information server best suited to handle the serving or transmittal of a banner to the terminal **36** will be the information server that can download or serve the banner to the terminal **36** in the shortest period of time. Other selection criteria can be used, however, in determining which information server is best suited to

download or serve a banner to a terminal, including the network topological distance between the terminal **36** and the information servers, the geographical distance between the terminal **36** and the information servers, the bandwidth of the information servers, or the round trip times for a message between the terminal **36** and the information servers. The use of a primary information server and mirror information servers allows all of the intelligence, databases, banner display counting processes, etc. for operating the method **110** of the present invention to be stored and operated in a single location, i.e., the primary information server, while allowing mirror information servers to be little more than network accessible memory devices or servers on which the banners are stored. Many Internet Service Providers (ISPs) and other network service providers connected to computer networks will provide memory space and will store documents and other files for access and retrieval from the computer network for relatively low cost and such storage capabilities are easy to implement and maintain.

As a further example, suppose that the user at the terminal **36** sends an initial banner request signal to the primary information server **54** during the step **112** and the primary information server selects a banner to be served to the during step **113**. If desired, the primary information server **54** can update the count information for the particular banner selected to be displayed on the user's terminal **36**. The primary information server **54** may determine that the mirror information server **56** is best suited for serving the selected banner to the terminal **36** since the mirror information server **56** can serve the selected banner to the terminal **36** in the shortest period of time. Alternatively, the primary information server **54** may determine that either it, the mirror information server **58**, or some other information server (not shown) connected to the computer network **30** can serve the selected banner to the terminal **36** in the shortest period of time. The information servers **54, 56, 58** may themselves be separated geographically or topologically such that every terminal connected to the computer network **30** has an optimal information server from which banners can be served, even if the terminals are scattered across a wide geographical or topological area. Therefore, for example, the terminal **36** may be optimally served by the mirror information server **56** while the terminal **32** may be optimally served by the primary information server **54** and the terminal **44** is optimally served by the mirror information server **58**. When the primary information server **54** has determined which information server is best suited to handle the serving of the selected banner to the terminal **36**, the primary information server **54** will return the banner location address for the selected banner at the selected information server to the terminal **36** during the return banner location address step **114**. The terminal **36** can then request that the selected banner be served from the selected information server during the steps **98, 100, 104, 116**, and **118** for display at the terminal **36**.

As previously discussed above, the selection of which mirror information server is the best suited for serving a particular banner to a particular terminal can be made a variety of ways. The criteria to be considered can include precision, i.e., the accuracy of the determination of which information server is best suited to serve a particular banner to a particular terminal, the ease of implementation, and the time required for the primary information server to make the determination of which information server is best suited to serve a particular banner to a particular terminal. The decision can be made by either the primary information server or by some other method.

As one example implementation of the decision criteria implemented in a primary information server, a table or matrix can be stored and maintained at the primary information server **54** which showing the relationship between each information server **54, 56, 58** and the particular terminal. The matrix preferably contains the round trip times for messages sent back and forth between each information server and the terminal. The information in the matrix can be updated continuously or periodically as desired. This information server determination method has several advantages. First, with such a matrix stored at the primary information server, the primary information server can quickly and accurately determine which information server is best suited to serve a particular banner to a particular terminal. Also, the time for the primary information server to make a decision is very fast and does not require additional searches of the computer network **30**. Furthermore, the primary information server will know exactly which information server served each and every banner to every terminal on the computer network, which can be very valuable for evaluating the efficiency of the method **110**.

This information server determination method described above does, however, also have several disadvantages. First, a significant effort is needed to generate the matrix and the information stored in the matrix, particularly if the computer network is quite large. More specifically, this method requires that monitoring software and/or hardware be operating at each information server to measure the round trip times between the information servers and the terminals. In addition, the matrix at the primary information server will need to be updated with the information created by the monitoring software and hardware at the mirror information servers so that accuracy of the matrix is maintained. Since the computer network may be continuously changing or evolving as new devices and networks are connected or disconnected from the computer network, and portions of the computer network may become temporarily disabled or offline, the overhead of monitoring the round trip times can be significant. The ability to create a matrix with the round trip times between all of the information servers and all of the terminals may take too long to develop, particularly if there is a significant number of terminals that do not ever request a banner stored on the information servers. This problem can be reduced by assuming that the round trip time between an information server and a particular terminal is the same, or at least approximately the same as, for example, other terminals connected to the same proxy server, the same as other terminals connected to the same sub-network, or the same as other terminals in a /24 network (a set of 256 contiguous IP addresses).

Another method in which the information server is best suited for serving a particular banner to a particular server uses and takes advantage of the Domain Name System (DNS) already being implemented on the Internet. As previously discussed above, DNS is a system for resolving or determining the thirty-two bit Internet Protocol (IP) addresses for each host computer or network device on the computer network. Every time a signal is generated by terminal or other device connected to the computer network requesting access to, or communication with, another device on the computer network, the IP address for the desired device must be determined if the signal does not already contain the IP address.

The DNS process is very complex and so a complete description of it is beyond the purview necessary for a complete understanding of the present invention. In addition, the DNS process is well known to people of

ordinary skill in this art. For purposes of a general explanation of how the DNS process can be used for selection of the information server to serve a banner to a particular terminal, the DNS process uses name servers or resolvers located in the computer network to determine the IP addresses. The name servers maintain listings of each computer or device in the computer network and their IP addresses. If a particular name server does not know a specific IP address when it is queried for the IP address, the name server can forward the query to another name server. Once the correct IP address is determined, it is passed along the reverse path to the terminal and is stored on all name servers who received the query and forwarded the query along.

With the present invention, each information server **54**, **56**, **58** operates a name server. Furthermore, each name server is configured to respond to a DNS request with the IP address of the information server containing the name server. When the banner location signal is returned to the terminal **36** during the step **114** from the primary information server **54**, the banner location signal contains a reference or general URL address of the banner to be served to the terminal, but not the specific IP address. The terminal **36** then initiates a DNS name resolving process prior to step **116** to determine the information server from which to serve the desired banner. Upon receiving the name resolving request from the terminal **36** or its nearby DNS name server, over the course of several transactions, each of the name server in each information servers returns an IP address to the terminal containing the IP address of the information server in which the name server is located. That is, name server in the information server **56** returns the IP address of the information server **56**, while the name server in the information server **58** returns the IP address of the information server **58**, etc. All of the IP addresses becomes stored in the DNS name server closest topologically to the terminal **36** since that DNS name server would have been the first name server to receive the name resolution request from the terminal **36**. The DNS name server keeps a list of all of the IP addresses for all of the information servers and the round trip times for communications between the DNS name server and the name servers located at the information servers. The round trip times are initially set to zero. When the DNS name server gets a request from the terminal **36**, it selects the information server having the shortest round trip time and provides the terminal **36** with the IP address of the selected information server. Since initially all of the round trip times are set to zero (0), the DNS server will randomly select one IP address and return it to the terminal **36**. The DNS name server will then monitor the round trip time between DNS server and the information server and update DNS name server's round trip time list for the particular information server's IP address returned to the terminal **36**. The next time the terminal **36** requests name resolution from the DNS server, the DNS name server will return the IP address of a different information server since the round trip time of the first information server will no longer be zero (0). After this process is implemented at least as many times for each terminal or each specified group or domain of terminals as there are information servers, the best information server for serving banners to the terminals or groups or domains of terminals will be determined and the appropriate IP addresses will be returned to the terminal requesting the DNS process. The standard DNS process includes ways for insuring that the route trip times are updated so that particular terminals are not locked into always receiving banners from particular information servers if other information servers become better suited for serving banners to the particular terminals.

This second information server determination method described above has several advantages. Unlike the first method described above, this method takes advantage of the already existing DNS process and requires no special monitoring or sniffing software or hardware to be installed at the information servers. Also the second method does not require a matrix to be generated and stored in the primary information server or updates to a matrix to be made. In comparison, the operation of a name server at each mirror site is simple to implement and operate. Therefore, in contrast to the first method, the second method is easy and relatively inexpensive to implement. Unfortunately, in contrast to the first method, the second system may be less precise and take longer to implement since a DNS search or rotation process will have to be implemented each time a banner is to be served to a terminal. In addition, until the round trip times for each information server are determined, the second method may produce less than optimal results. Furthermore, updating of the round trip time information may require using an information server other than the optimal information server to serve a particular banner to a particular terminal. Finally, the shortest round trip time between the DNS name server and the name servers at the information servers may not be an accurate reflection of the round trip times between the terminal and the information servers, particularly if a given user's DNS name server is topologically distant from the terminal. As a result, the information server selected by the DNS name server may not always have the shortest round trip time to the terminal.

Other methods for determining which information server is best suited to serve a particular banner to a particular terminal include looking at the information, if any, about the terminal received in the initial banner request signal generated during step **112**. The information might include things such as the country code or the network code in which or on which the terminal resides. In addition, the information might include information about how the initial banner request signal was routed from the terminal to the primary information server, thereby giving an indication of the topological location of the terminal in the computer network. The primary information server can then use this information dynamically or in conjunction with a matrix lookup process to determine which information server to select to serve the selected banner to the terminal requesting a banner.

Another important benefit of mirroring is that it allows for redundancy and back-up if one or more of the information servers connected to the computer network **30** goes offline or becomes otherwise inaccessible or incapable of serving banners to terminals. For example, in the preferred method, the initial banner request signal is preferably sent by a terminal to the primary information server **54** during the send initial banner request signal step **112**, thereby allowing the primary information server **54** to be the centralized source of intelligence and the centralized source of banner display monitoring and counting. If however, the primary information server **54** becomes disabled or goes offline for any reason, one of the mirror information servers **56**, **58** can temporarily or permanently become the primary information server for the computer network **30**, thereby allowing the delivery of banners to terminals to continue. Preferably, the switch from the disabled primary information server **54** to the back-up information server **56** or **58** can take place very quickly such that little impact on the delivery of banner information is noticed or even created. It should be noted,

however, that the backup primary information server will need to contain all of the centralized intelligence, databases, banner counting and monitoring software, etc. operating on the original primary information server **54** such that the backup primary information server can operate appropriately if the original primary information server **54** becomes disabled or goes offline.

The switch over to the backup primary server can be handled in a variety a ways. For example, once again taking advantage of the Domain Name System (DNS) process and Internet Protocol (IP) addresses, both the primary information server and the backup information server will operate a name resolver or name server such that when the initial banner request signal is generated during the step **112** that does not contain the needed IP address, the IP address for the primary information server is returned to the terminal **36** and stored in all name servers receiving and processing the query for the IP address of the primary server. The backup information server will monitor the primary information server and, in the event that the primary information server goes offline or becomes otherwise disabled, the backup information server will shut down or disable the name server at the primary information server. Furthermore, the backup information server will begin returning its IP address instead of the IP address of the primary information server when queries are received. All IP address information stored in name servers has a time-to-live (TTL) value that is set by the name server returning the IP address. When the TTL value expires, the IP address information is no longer stored in the name server and the name server will have to forward any requests it receives for the IP address. Therefore, when either of the name servers in the primary information server or the backup information server returns an IP address for the primary information server, the IP address is set to have a finite TTL value of, for example ten to thirty minutes. In the event of the primary information server going offline, eventually the IP addresses for the primary information server stored in the name servers will expire and queries for the IP address will reach the name server in the backup information server which will then return its IP address instead of the IP address of the primary information server. Thus, within a finite time and selected TTL, all name servers in the computer network that have stored or cached the IP address of the primary information server will have their caches or memory cleared. They will then ask for new addresses and receive the IP addresses of the backup information server in response.

The use of a centralized primary information server along with at least one mirror information server on a computer network provides significant advantages for the delivery of banners containing advertising information to a terminal for display on the terminal. First, advertising banners are in most cases going to be delivered to the terminal requesting the advertising banner in quick and efficient manner since the information server best suited for delivering and serving a banner to a terminal will in most cases be the information server selected by the primary information server to deliver the banner to the terminal. The faster the advertising banner is delivered to a terminal, the more likely the user at the terminal is to look at the advertising banner, particularly if the advertising banner is displayed on the user's terminal for a longer period of time before the user exits the web page or selects a new page. In addition, mirroring of information servers allows for the relatively fault tolerant delivery of advertising banners to users at the terminals, thereby reducing or even eliminating lost opportunities to display advertising banners on terminals when the primary information server becomes disabled or otherwise goes offline. Furthermore, centralizing the intelligence at a primary information or ad server allows the displays of advertising banners to be continuously and accurately monitored, thereby increasing the ability to judge the success or failure of specific advertising banners.

The foregoing description is considered as illustrative only of the principles of the invention. Furthermore, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and process shown and described above. Accordingly, all suitable modifications and equivalents may be resorted to falling within the scope of the invention as defined by the claims which follow. For example, while the method **110** of the present invention is directed primarily to the accurate counting of banner information displayed with web pages, the method **110** can also be used to provide an accurate count of the number of times specific web pages are displayed on a user's terminal by creating a send initial page request signal step in a similar manner to the send initial banner request step **112** and a return page address location step in a similar manner to the return banner location step **114** prior to the storage determination step **76**. In addition, while the method **110** of the present invention has been described with connections to the computer network **30** being made primarily by terminals, computers, and proxy servers, it should be appreciated that the method **110** will also be suitable for use with other devices connected between the user's terminal and the computer network may exist which can cache or store the web pages or the banner information.

As yet another example of how the method **110** can be modified, if a primary information server receiving the initial banner request signal generated by a terminal during step **112** determines that the primary information server itself is the information server best suited for downloading or serving a selected banner to the terminal, the primary information server may, instead of sending a banner location signal to the terminal during the step **114**, simply transmit the selected banner to the terminal directly, thereby eliminating some of the steps in the method **110**.

As yet another example of how the method **110** of the present invention can be modified, it is possible to move the steps **112** and **114** to between the steps **92** and **116** in FIG. **4** so that the steps **112** and **114** are no longer performed after step **88** and before step **92**. The steps **112** and **114** are instead implemented after the step **92** and before the step **116** if the answer in step **92** is "no". In this embodiment, web pages and banners that are stored in a user's terminal are automatically reloaded and displayed on the user's terminal without generating additional signals on the computer network. Therefore, if a user "backs" through a page, i.e., the user moves through a series of pages, each of which are displayed on the user's terminal and stored in the terminal's memory along with the page's associated banners, and then decides to review or redisplay some of the pages (such as by using the "back" function of the browser software operating on the user's terminal), no initial banner request signal is generated during the step **112** since the steps **88**, **92**, **94** will be followed in sequence. While this embodiment of the method **110** of the present invention does not allow the redisplay of the banners on the same terminal (and presumably to the same user) to be counted or monitored, it still allows the redisplay of banners stored in the proxy server, but which are requested to be displayed on different terminals (and presumably to different users), to be counted and monitored.

While the method **110** of the present invention has been discussed in detail primarily with the counting, monitoring, and targeting of advertising or other content over computer networks, the method **110** can also be used for the counting, monitoring, or targeting of content or banners over local area networks, e-mail networks, and non computer networks such as switched-network cable television. In addition, the method **110** can easily be implement to monitor levels of content sophistication, content language, content type, content levels of summarization, etc. when different content options are selectable by a user or terminal.

It should also be noted that, while the terms information server, computer site, web site, server, media property have been used to describe the method **110** of the present invention, the terms have been used only to help clarify different portions of the method **110**. Thus, an information server could also function as a computer site, a computer site could also function as an information server, and both could be labeled generically as servers. The method **110** of the present invention, therefore, should not be limited by the terminology used to describe different aspects of the present invention.

What is claimed is:

1. A method for storing information on a primary server and one or more secondary servers and on computer sites connected to a computer network, wherein information delivered over the computer network to a terminal or a group of terminals may contain references to other information to be delivered to the terminal, comprising:

serving a first portion of information to a terminal, wherein said first portion of information contains a reference to a second portion of information;

causing a first request signal to be transmitted from the terminal to a primary server requesting a location address for said second portion of information from which said second portion of information can be served to the terminal, wherein said first request signal includes information intended to prevent said first request signal from being blocked from reaching said primary server by either the terminal or any intermediary device located topologically between the terminal and the primary server as a result of previous caching of said first portion of information or said second portion of information in the terminal or said intermediary device;

sending a location signal from the primary server to the terminal providing said location address of said second portion of information;

causing a second request signal to be transmitted from the terminal containing said location address of said second portion of information and requesting said second portion of information be served to the terminal; and

serving said second portion of information to the terminal.

2. The method of claim **1**, wherein said intermediary device is a proxy server.

3. The method of claim **1**, wherein said second portion of information is served from the primary or secondary servers.

4. The method of claim **1**, wherein said first request signal is a content general request signal.

5. The method of claim **4**, wherein said second request signal is a content specific request signal.

6. The method of claim **1**, wherein said second portion of information is served from one of the secondary servers.

7. The method of claim **1**, wherein after the primary server receives the first request signal from the terminal, further including determining which server connected to the computer network is best suited for serving said second portion of information to the terminal.

8. The method of claim **7**, wherein results of said determining are included in said location signal sent from the information server to the terminal.

9. The method of claim **8**, including creating a matrix of selections between each of the terminals or groups of terminals and each of the servers and using said matrix to determine which of the servers is best suited to serve said second portion of information to the terminals or groups of terminals.

10. The method of claim **9**, wherein said selections contain round trip times between the servers and the terminals or groups of terminals.

11. The method of claim **1**, including making one of the secondary servers a new primary server if the original primary server becomes inaccessible.

12. The method of claim **1**, including storing said second portion of information in the terminal.

13. The method of claim **1**, wherein said first request signal includes the strings "cgi-bin" and "?".

14. The method of claim **4**, including selecting the composition of said second portion of information.

15. The method of claim **14**, wherein the results of said composition selection are included in said location signal sent from the information server to the terminal.

16. The method of claim **1**, wherein said location signal includes an HTTP 302 redirect command.

17. The method of claim **1**, wherein said reference to a second portion of information includes at least a portion of a URL.

18. The method of claim **1**, wherein said first portion of information is a web page, said second portion of information is a banner, and said reference is a link.

19. The method of claim **1**, including counting at least one display of said second portion of information on the terminal.

20. A method for distributing a banner over a computer network to a device when the banner is referenced or linked to in a document served to the device, wherein the banner is stored in one or more servers, comprising:

receiving a first banner request signal from a device at a first server requesting that a banner be served to the device, wherein said first banner request signal includes information intended to prevent said first banner request signal from being blocked from reaching said first server by the device despite previous caching of said specified banner in the device;

sending a banner location signal from said first server to the device, wherein said banner location signal includes location information for a specified banner stored on a second server; and

receiving a second banner request signal from the device at said second server requesting that the second server serve said specified banner to the device.

21. The method of claim **20**, wherein said second server is said first server.

22. The method of claim **20**, including determining which of the servers is best suited for serving said specified banner to the device.

23. The method of claim **22**, wherein said determining which of the servers is best suited for serving said specified banner to the device is performed in said first server after said first server receives said first banner request signal from the device.

24. The method of claim **20**, wherein said first banner request signal is a content general banner request signal.

25. The method of claim 24, wherein said second banner request signal is a content specific banner request signal.

26. The method of claim 20, including storing said specified banner in said device.

27. The method of claim 26, including determining whether said specified banner is stored in the device before said receiving said second banner request signal.

28. The method of claim 20, including selecting said specified banner prior to sending said banner location signal from said first server to the device.

29. The method of claim 20, wherein all of the banner information stored on said first server is also stored on said second server.

30. The method of claim 20, including counting a display of said specified banner on said device.

31. The method of claim 20, wherein said location information includes at least a portion of a URL.

32. The method of claim 20, wherein said first request signal includes the strings "cgi-bin" and "?".

33. The method of claim 20, wherein said banner location signal includes an HTTP 302 redirect command.

34. A method for enabling a web page and an associated banner to be served to a computer, wherein the web page contains a link or other reference to the banner, comprising:

serving a web page to a computer;

causing a banner request signal to be sent from the computer to a primary server requesting a banner be served to the computer, wherein said banner request signal includes a Uniform Resource Locator address for said primary server and wherein said banner request signal includes information intended to prevent said banner request signal from being blocked from being received by the primary server as a result of previous caching of the banner on the computer;

determining which specified banner will be served to the computer; and

sending a banner location signal from said primary server to the computer, wherein said banner location signal includes the Uniform Resource Locator address for a device on which the specific banner to be served to the computer is stored.

35. The method of claim 34, wherein said banner request signal includes a content general Uniform Resource Locator address.

36. The method of claim 34, including determining whether said specified banner is stored on the computer.

37. The method of claim 36, wherein after said determining whether said specified banner is stored on the computer, if said specified banner is not stored on the computer then including causing a second banner request signal to be sent to said device requesting that said device serve said specified banner to the computer.

38. The method of claim 37, including serving the specified banner from said device to said computer.

39. The method of claim 34, wherein said banner location signal constitutes an HTTP 302 redirect signal.

40. The method of claim 35, wherein said banner location signal includes a content specific Uniform Resource Locator address for the specified banner.

41. The method of claim 34, including tagging said specified banner as being cachable.

42. The method of claim 34, wherein said device is said primary server.

43. A method for distributing a banner over a computer network to a device when the banner is referenced or linked to in a hypertext document served to the device, wherein the banner is stored in one or more servers, comprising:

receiving a first banner request signal from the device at a first server requesting that a banner be served to the device, wherein said first banner request signal includes information intended to prevent said first banner request signal from being blocked by the device or an intermediary server located between the device and said first server as a result of a previous storage in the device or said intermediary server of a response to said first banner request signal sent from said first server to the device;

determining if said first server is best suited to serve said banner to the device and serving said banner to the device if said first server is best suited to serve said banner and, if said first server is not best suited to server said banner to the device, sending a banner location signal from said first server to the device, wherein said banner location signal includes location information for a specified banner stored on a second server;

receiving a second banner location request signal from the device at said second server requesting that said second server serve said specified banner to said device if said first server is not best suited to server said banner to the device; and

serving said specified banner to said device from said second server if said first server is not best suited to server said banner to the device.

44. The method of claim 43, wherein said document is a web page.

45. The method of claim 43, wherein said first banner request signal includes the strings "cgi-bin" and "?".

46. The method of claim 45, wherein said banner relocation signal includes an HTTP 302 redirect command.

47. The method of claim 43, wherein said banner location information includes at least a portion of a URL.

48. The method of claim 43, including counting at least one display of said specified banner on the device.

49. A method for enabling distribution of a banner over a computer network to a device when the banner is referenced in a document served to the device, wherein the banner is stored in one or more servers connected to the computer network, and the device is connected to the computer network via an intermediary server, comprising:

causing a first banner request signal to be transmitted from the device to a first server requesting that a banner be served to the device, wherein said first banner request signal includes information intended to make said first banner request signal not blockable by the device or the intermediary server as a result of a storage in the device or the intermediary server of said requested banner prior to the generation of said first banner signal by the device;

sending a banner location signal from said first server to the device, wherein said banner location signal includes location information for said requested banner stored on a second server; and

determining if said requested banner is stored on the device and, if said requested banner is not stored on the device, then causing a second banner request signal to be transmitted from the device to the intermediary server and determining if said requested banner is stored on the intermediary server, wherein if said requested banner is not stored on the intermediary server, causing at least a portion of said second banner request signal to be sent to said second server requesting that said second server serve said requested banner to said device.

50. The method of claim 49, wherein said second server is said first server.

51. The method of claim 49, wherein said first banner request signal is a content general request signal.

52. The method of claim 51, wherein said second banner request signal is a content specific request signal.

53. The method of claim 49, including having said first server select said requested banner.

54. The method of claim 49, wherein said first banner request signal includes the strings "cgi-bin" and "?".

55. The method of claim 49, wherein said banner location signal includes an HTTP 302 redirect command.

56. The method of claim 49, wherein the document includes at least a portion of a web page.

57. The method of claim 49, wherein said location information includes at least a portion of a URL.

58. The method of claim 49, including counting at least one display of said specified banner on the device.

59. A method for serving a banner to a client device, comprising:

receiving at a primary server a first request for a banner, said first request containing at least a portion of an initial URL, wherein said first request includes information intended to prevent said first request from being blocked from the primary server despite previous storage of the banner on the client device;

sending a signal from the primary server to the client device that includes at least a portion of a second URL associated with the banner's location;

receiving at the primary server a second TCP/IP compliant request requesting that the banner be served to the client device if the banner is not stored on the client device;

serving the banner to the client device; and

counting at least one display of the banner on the client device.

60. The method of claim 59, wherein said first request includes the strings "cgi-bin" and "?".

61. The method of claim 59, wherein said signal sent from said primary server to the client device includes an HTTP 302 redirect command.

62. The method of claim 59, wherein said first request cannot be prevented from being received by the primary server as a result of previous caching or storing of the banner by an intermediary device connected to the computer network.

63. The method of claim 62, wherein said intermediary device is connected topologically on said computer network between the client device and the primary server.

64. A method for enabling accurate counting of displays of a banner on a client device, comprising:

receiving a first banner request signal at a first server requesting that a banner be served to a client device, wherein said first banner request includes information intended to prevent said first banner request signal from being blocked from said first server, even though there has been previous caching or storing of said banner by the client device or an intermediary device;

sending a banner location signal to the client device, wherein said banner location signal includes location information for a specified banner stored on a second server; and

causing a determination of whether said specified banner is stored on the client device and, if said specified banner is not stored on the client device, receiving a second banner request signal from the client device at said intermediary device and causing a determination of whether said specified banner is stored on said intermediary device, wherein if said specified banner is not stored on said intermediary device, receiving a third banner request signal at said second server requesting that said second server serve said specified banner to the client device.

65. The method of claim 64, wherein said intermediary device is a proxy server.

66. The method of claim 64, wherein said third banner request signal is identical to said second banner request signal.

67. The method of claim 64, wherein said banner location signal includes an HTTP 302 redirect command.

68. The method of claim 64, wherein said first banner request signal includes the strings "cgi-bin" and "?".

69. The method of claim 64, wherein said first server and said second server are the same server.

70. The method of claim 64, including serving said specified banner to the client device.

71. The method of claim 70, including counting at least one display of said specified banner on the client device.

72. A method for serving a banner to a client device, comprising:

receiving at a primary server a first request signal for a banner, said first request signal containing at least a portion of an initial URL, wherein said first request signal includes information intended to prevent said first request signal from being blocked from the primary server as a result of previous caching of the banner in the client device;

sending a signal from the primary server to the client device that includes a second URL associated with the banner's location;

receiving a second request signal requesting that the banner be served to the client device if the banner is not stored on the client device; and

serving the banner to the client device.

73. The method of claim 72, including counting at least one display of the banner on the client device.

74. The method of claim 72, wherein said first request signal includes the strings "cgi-bin" and "?".

75. A method for enabling a banner to be received at a client device, comprising:

generating at the client device a first request signal for a banner;

transmitting said first request signal to a server, wherein said first request signal includes information intended to prevent said first request signal from being blocked from the server as a result of previous caching of the banner on the client device;

receiving at the client device a response signal from the server that includes a URL associated with the banner's location; and

transmitting a second request signal from the client device requesting that the banner be served to the client device.

76. The method of claim 75, wherein said first banner request signal includes the strings "cgi-bin" and "?".

77. The method of claim 75, wherein said response signal includes an HTTP 302 redirect command.

78. The method of claim 75, including receiving the banner at the client device.

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