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TITLE

AN INTERNET FILTERING SYSTEM FOR FILTERING DATA TRANSFERRED OVER THE  
internet utilizing immediate and deferred filtering actions

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## PATENT APPLICATION



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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): William S. Duvall and Matthew Kendall

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For: INTERNET FILTERING SYSTEM

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TRANSMITTAL LETTER

Enclosed for filing are the following document(s):

1. Application (26 pages) including specification (20 pages), claims (5 pages), and the Abstract of the Disclosure (1 page);
2. Six sheets of drawings including Figs. 1-5(d);
3. Combined Declaration and Power of Attorney (unsigned); and
4. Express Mail Certification (EM234963485US).

Respectfully submitted,

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**EXPRESS MAIL CERTIFICATION**

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I hereby certify that this transmittal letter and the other papers and fees identified in this transmittal letter as being transmitted herewith are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. 1.10 on the date indicated above and are addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

Michael A. Diener

Michael A. Diener





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INTERNET FILTERING SYSTEM

Field of the Invention

This invention relates to a system for filtering messages transmitted between the Internet and a client computer.

Background of the Invention

While the Internet is very useful for obtaining information, many people are concerned that objectionable materials, especially sexually explicit materials, can be obtained too easily. Many parents are particularly concerned that their children can get access to such objectionable materials without supervision.

Congress recently passed the Communications Decency Act (CDA) to outlaw transmission of indecent material over the Internet. Many in the "Internet community" view the CDA as censorship, and have organized an online free speech campaign. Many also believe that parents should have the primary responsibility for controlling what their children obtain and view over the Internet.

Object and Summary of the Invention

It is an object of the present invention to provide a system that allows Internet users to filter material transmitted over the Internet.

According to an embodiment of the present invention, a client-based filtering system compares portions of incoming and/or outgoing messages with filtering information stored in a filter database, and determines whether to block or allow the incoming and/or outgoing transmissions of messages in response to the comparison. In response to a match between certain information in portions of the message and the filtering information, the system can employ one of a number



of different specified blocking options, including discarding incoming data, preventing execution of an open command, or replacing parts of received data.

In a preferred embodiment, the system compares an interface port and an IP address to a stored list of ports and addresses. If a match is found, the system can allow the message to be transmitted or block the message prior to transmission. The system can defer the decision whether to allow or block, and then monitor transmissions to search for a particular command and a particular filter pattern. If a pattern is detected during an outgoing message to a host server, the system can block resulting incoming transmissions from that server. Thus, the system can check both IP addresses and strings in URLs.

The system preferably communicates with a remote update server that has new filtering information for updating the filter database. The system periodically accesses the update server over the Internet, and downloads one of a number of new sets of filters from the server to replace some or all of the existing filters.

The filter database and all implementation software preferably reside on the client computer system. Alternatively, a filtering database and implementing software can be stored on a server in a network to which the client is coupled, and can thus be incorporated into a firewall, gateway, or proxy server.

To implement this system, the present invention also includes methods for patching the operating system to take into account multitasking and variable-length instructions. In Windows 95, in which a copy of certain library programs is made from disk into RAM for each application, the present invention uses patches to inject filtering code into RAM without modifying or replacing the library on the disk. These patches cause a buffer to store a series of copied instructions from a called routine, where the buffer is between certain head processing routines and tail processing



routines. Because the library is not replaced or modified, the system can adapt to upgrades or reloading without the concern of losing modified or alternate variations of programs.

5 With the present invention, a user can filter material received over the Internet that is personally objectionable, whether that material is sexually explicit, violent, politically extreme, or otherwise, depending on that user's individual tastes and sensitivities. By providing updates on-  
10 line, the system can adapt as new sites and servers are added to the Internet. Other features and advantages will become apparent from the following detailed description, drawings, and claims.

#### 15 Brief Description of the Drawings

Fig. 1 is a block diagram of a network with a client computer for accessing the Internet.

Fig. 2 is a block diagram of a client computer system with a filtering system.

20 Figs. 3 and 4 are flow charts illustrating filtering methods implemented by the filtering system.

Figs. 5(a)-5(d) are charts illustrating known and new patching methods.

#### 25 Detailed Description

A user uses a computer which serves as a client 10 to communicate with other computers over Internet 12. A number of clients are typically linked to a network 14, such as a local area network (LAN) or a broad-based commercial service. Many such networks are linked to one of a number of  
30 Internet providers 16, such as BBN, Inc. of Cambridge, Massachusetts, which in turn, accesses the Internet.

Messages are transmitted over the Internet among computers with a transport protocol known as Transmission Control Protocol/Internet Protocol (TCP/IP). This protocol  
35 provides an error-free data connection between computers,



and sits underneath and works in conjunction with higher level network protocols, including HyperText Transfer Protocol (HTTP); File Transfer Protocol (FTP); Network News Transmission Protocol (NNTP); Internet Relay Chat (IRC); and  
5 GOPHER.

According to the current Internet Protocol (version 4), each computer on or connected to the Internet has an IP address that identifies the location of the computer. Each IP address is a 32-bit number that is often written in the form  
10 n1.n2.n3.n4 (each nx represents an 8-bit number). (Version 6 of the Internet Protocol is expected to have 128-bit addresses, with one address for each interface, and with different types of addresses.) To initiate communications with another computer over the Internet, a computer opens a port  
15 in its interface for a TCP data stream. The computer sends messages that have defined fields for its own IP address and for the recipient computer's IP address.

With HTTP, a user can access web sites over the world-wide web using one of a number of commercially available web  
20 browsers, such as a Spyglass Mosaic web browser, available from Spyglass Inc. of Naperville, Illinois. To access a web site, the user enters a uniform resource locator (URL) request with the form "http://www.name.ext", where "http://" indicates the protocol, and "www.name.ext" is a domain name  
25 (although currently "www" is often not required). Such a domain name with this form typically points to a home page. The domain name can also be followed by other file names or directories, with the directories separated from the domain name and from other directories with slashes that serve as  
30 spacer characters. The directories sit below the home page, but are individually addressable and accessible. URL requests are also made with the other protocols noted above, such as FTP and NNTP.

When a user enters a URL request, the client provides  
35 the URL to a domain name server (DNS) 18. DNS 18, which may be accessed through the Internet or directly from network



14, looks up the domain name and returns the IP address associated with that URL (if the name is in DNS 18). The client opens a TCP data stream and uses this IP address to communicate with the other computer.

5 Domain names in a URL are often descriptive. For many companies and other organizations, the domain name includes their own name, a close variation, or some acronym of their name. Other Internet service providers use names that are descriptive of some service that is provided or some interest that is addressed, e.g., "www.chess.com." While many  
10 descriptive names may be nonobjectionable, others such as "xxx" or "sex" may be included in a URL of a server that provides sexually explicit material that may be objectionable to some users. The string "sex" could, however, be  
15 part of some completely different name, such as "Essex" or "sextet."

While the domain name itself may not be objectionable, there may be objectionable certain files or directories below that domain name. For example, some commercial online  
20 services allow users to build personal home pages but do not restrict the material on that home page. Consequently, some but not all of the directories may be objectionable. It could be undesirable to eliminate all accesses to such a domain name if only a relative few directories under that  
25 domain name are objectionable.

Referring also to Fig. 2, in a first embodiment of the present invention, a filtering system resides in client computer 10. Processing by the filtering system is carried out by the computer's processor 20, and the system uses the  
30 computer's storage 22 to store a filter database 24. The filter database would typically be maintained in the client computer's hard drive, and could be copied to RAM during operation.

The client communicates with the Internet through an  
35 interface 26 that has a number of ports. By convention, certain default ports are associated with certain protocols;



e.g., HTTP communications are typically transmitted through a port numbered 80. In the transmitted message, however, the user can specify another port that is different from the default port. Moreover, multiple ports can be used for one  
5 protocol, and one port could be used for multiple protocols. Thus, each TCP data stream passes through one of a group of numbered ports in interface 26. The client monitors these ports and maintains internal tables that indicate the state of each active TCP data stream, whether that stream is open  
10 or closed, for both incoming and outgoing transmissions.

The filter database has lists of filters, some of which are identified as either ALLOW filters or BLOCK filters for respectively allowing or blocking transmission. Both ALLOW and BLOCK filters in the database preferably have fields for  
15 port number and IP address. These fields can include a specific port number, a specific IP address, and/or meta values ANY IP and ANY PORT, which stand for all possible IP addresses and all possible port numbers, respectively. Thus, a filter can apply to a specific port and a specific ad-  
20 dress; to a particular port regardless of the address by specifying the port and ANY IP; to a particular address regardless of the port by specifying the address and ANY PORT; or even any address in any port for complete blocking or as a catch-all default by indicating ANY IP and ANY PORT.

25 Each filter entry in the filter database also has a field for specifying an action to be taken by the client if that filter were retrieved. These actions are essentially divided into two groups, direct action or deferred action. Direct actions indicate that the system should uncondition-  
30 ally allow or unconditionally block the transmission. When filter entries are retrieved, they are first scanned for entries that require direct action; if there are any, these actions are carried out immediately. Deferred actions are discussed in more detail below.

35 When a message is transmitted, whether that message is incoming or outgoing with respect to the client computer,



the filtering system compares the IP address and/or other information in the data stream to the filter entries stored in the database to determine whether some action needs to be taken. The filters are preferably stored so that the system  
5 searches ALLOW filters first, BLOCK filters next, and deferred action filters last, and takes action based on the first matched filter. In this order, ALLOW filters thus take precedence over BLOCK filters; accordingly, if a specific IP address/port is matched by both an ALLOW filter and  
10 a BLOCK filter, the ALLOW filter takes precedence. Alternatively, selected BLOCK filters or all BLOCK filters can be searched before the ALLOW filters to make sure that certain messages are blocked.

Referring to Fig. 3, the filtering system can filter  
15 outgoing messages on the basis of the IP address of the host server that is being contacted by the client. The filtering system detects when the client opens the data stream for a particular port and IP address (step 100), and searches the filter database for matching filters. The system first  
20 searches by port number to get the list of filters with IP addresses associated with meta value ANY PORT and also with the particular opened port (step 102). The system then checks for and retrieves any filters that match the particular IP address. The retrieved filters are checked to deter-  
25 mine if any require immediate action, i.e., if unconditional allowing or blocking is required (steps 104, 106). If such action is required and it is to allow the transmission, the system allows the transmission to proceed normally (step 108). If the immediate action is to block the transmission,  
30 the system takes action to block the transmission (step 110), and provides a "Blocked" message to the user (step 112).

When blocking is done on the basis of the IP address of the outgoing message, such blocking is preferably ac-  
35 complished by simply not executing the open command. This nonexecution causes a failure result to be returned to the



application (e.g., web browser) that called the open command. The system also provides a screen on the user's display indicating that the transmission was blocked, and advising the user on how to get back to the state before the user tried to open the stream and send the message.

If, at step 104, it is determined that no immediate action must be taken, it is determined whether a deferred action must be taken with respect to any of the retrieved filter (step 116). If there is also no deferred action, the system can default to allow the transmission (step 108), or it can default to block the transmission (steps 110 and 112). Such defaults can be implemented with a last filter that includes entries ANY PORT and ANY IP, and an action that indicates allow or block. As noted above, prior conflicting filters would take precedence over this effective default in the last filter.

Deferred filter entries preferably have additional fields, including fields for (1) a keyword, typically a command such as GET; (2) a filter pattern to be compared to data in the message, typically a string of characters; (3) a directional indicator (IN/OUT) for indicating incoming or outgoing transmissions; (4) a compare directive for the type of match; and (5) an action to be taken, typically to allow or block the transmission. The compare directive indicates a type of match, e.g., whether the pattern must match with equality, whether it must appear in a particular substring, or whether it can appear with a wildcard character before, after, before and after, or embedded in the string.

Referring to Fig. 4, when data is transmitted over an open TCP/IP connection, the direction of the transmission is compared to the directional indicators in the deferred entities (step 130). For each entry in a filter that matches the direction, the beginning of the data stream is compared to the keyword in the filter entry (step 132). If the keywords match (step 134), the data is further compared to the filter pattern of the filter(s) according to the compare



directive (step 136). If a match is found at this level (step 138), the specified action in the filter is taken (step 140).

The filters are preferably queued so that filter pattern matching is performed when incoming data is received from the host server following a particular detected outgoing command. With such queueing, a similar scan of the message is performed on the outgoing transmission, but blocking is performed on the incoming message. Blocking actions that are available for incoming messages are different from those for outgoing messages. The incoming data can be discarded, replaced by data from the database, or edited to remove occurrences of entries containing patterns stored in the database entry. Because modifications to incoming data can change the length of the data, because the filtering system has no way of knowing how much data will be received, and because edits by the filtering system may result in the data stream being broken across an edit, the filtering system preferably locally buffers incoming data with a local fragment buffer. The contents of the local fragment buffer may be edited to change or delete portions of the data in another part of the buffer or in storage used temporarily. The unedited portion may be returned to the fragment buffer so that the entire transaction will be transparent to the application requesting the data.

Specified parts of the protocol message can be corrupted, or portions of the response to a protocol message can be deleted. These approaches are most commonly used when access is requested by a news reader to a news group over NNTP (or by a request to a chat channel over IRC). When such a request is made, the server responds with a list of news groups that match the request. While many of the news groups may be nonobjectionable, it may be desirable to block some of the listed items. The system allows certain listed items in the response to an NNTP request to be blocked while allowing certain other strings. With these



options, even though some items are allowed, a "Blocked" message should be provided on the user's screen to notify the user of the action taken.

The locations, names, and meanings of keywords and filter patterns in the URL vary with the particular protocol. The system determines the particular protocol that is being used based on the port number as stored in the database. Thus the protocol is generally determined by the filters within the database, rather than by the filtering system software outside the database. When the system determines the protocol from the port, it then matches the specific URL (or group of URLs) based on locations in the URL where the commands are for that specific protocol. A pattern match is then performed on that part of the URL.

As an example of blocking an HTTP transmission, assume that the user requests "http://www.domain/test.html." The client transmits the URL request and the domain name server returns an IP address, e.g., 1.2.3.4, corresponding to the domain name. The client tries to open a TCP/IP connection with that IP address and typically with port 80. If that IP address and port 80 (or that IP address with ANY PORT) are together in a BLOCK filter, the system prevents the data stream from opening.

Rather than specifying blocking at this time, a filter can indicate a deferred action. In this example, the filter searches for a GET command as the keyword in an outgoing data stream, and for "test.html" as the filter pattern in the transmission. When the client sends a transmission with a GET command to get information under the directory test.html, the host server will respond with data for that directory. But if there is a blocking filter for test.html, the system can block the incoming data by discarding it or replacing it.

The filter pattern can specify particular strings for both allowing or for blocking. This can be useful when a potentially objectionable phrase may be part of an unrelated



phrase. For example, the filters can cause the system to allow transmission of a directory with the string "sextet", while blocking transmission to or from a directory with the string "sex" by itself. By using wildcards (characters that stand for any non-alpha characters, such as "/" or "." before and/or after a particular phrase), particular appearances of "xxx" can be blocked, as it is less likely to be part of a nonobjectionable string; for example, if "\*" indicates the wildcard, a filter pattern can be \*xxx\* indicates that any instances of xxx set off with periods, slashes, or other spacers within a URL will be matched by the filter.

While strings for filter entries may be searched sequentially, if there are many strings that need to be searched, the strings can be searched as a collection of strings organized by their beginning letter. In this case, the first character of each string is used as an offset into a table of starting positions in a string storage pool containing all of the strings to be searched. Strings within this pool are grouped by their beginning letter. The offset table contents for any letter contains the address within the pool of the first string beginning with that letter. This technique allows faster overall searching since only the strings that begin with the same letter need to be checked to determine a match. For more efficiency, a filter entry whose strings all begin with the same letter look for that letter specifically. If there is a match, then the remainder of the search is performed as described above, but beginning with the second character in the string being searched rather than the first.

Accordingly, when a match is found to a filter entry, whether the match is from an incoming message, outgoing message, an IP address, a phrase in a domain name, or a phrase somewhere else in the URL, the filter entry specifies one of a number of different actions with respect to different IP addresses and URLs. The filtering system can: (1) block access to a specific IP address, regardless of the port;



(2) block access to a specific port, regardless of the IP address; (3) block access to selected URL's on a specific port regardless of the IP address based on the content of the URL; e.g., prevent access to any web page containing the letters "sex" or "xxx" in the URL; (4) block access to a URL  
5 or family of URLs at a specific IP address/port; (5) allow access to certain sites that would otherwise be blocked by the filter database; and (6) block access to all sites, and then allow access to specific sites, URLs, or families of  
10 URL's.

To implement option (6), for example, the system may have certain specified ALLOW filters, followed by a BLOCK filter for ANY PORT and ANY IP. The ALLOW filters would supersede later BLOCK filters, so the presumption is that  
15 what is not allowed is forbidden.

#### Updating Mechanism

Referring again to Fig. 1, when the system of the present invention is first loaded into a client system, it  
20 may have an initial set of filters for the filter database. Because Internet sites are being added to the Internet at a fast rate, however, the filtering system preferably also has an updating mechanism to keep the filters current. The updating mechanism in the filtering system can locate a particular HTTP or FTP update server 32 over the Internet. Af-  
25 ter optional user authentication, the updating mechanism causes the filtering system to download from the update server one of a number of new sets of filters, and preferably causes some or all of the existing filters in the filter database to be replaced with the newly downloaded fil-  
30 ters.

When a user first installs the filtering system, the user is preferably provided with the authorization to make an initial download from the update server. This initial  
35 download addresses the potential problem of software aging on a store shelf. This download can supplement a filter



database, or can be provided instead of an initial filter database. When the user updates with the initial download, the user is given an opportunity to obtain a subscription by filling out an on-screen subscription form to obtain further  
5 filter updates. Data from this form is transmitted and used to validate the user.

To obtain a download, the client identifies itself to the update server with a serial number. The server hashes the serial number into a value between 0 and 124 with a  
10 hashing function that provides a relatively uniform distribution of serial numbers over the range of numbers. The hash value is used to locate a file containing user data for serial numbers with that specific hash value. This data file is then downloaded into the client, and a search is  
15 conducted to find a matching entry in the client. If found, the entry contains subscription information, including expiration date, frequency of update, and identification of the filter set to be downloaded.

The update server can store and provide up to 65,536  
20 different filter sets, each with a different group of materials to be filtered. The user data file indicates which set of filters is to be downloaded. Each set also includes additional information, including its creation date and version. If a download is made for a user who does not have an  
25 entry in the user database, the updater determines which set of filters to download.

The updating server sends email messages to a particular email address whenever a download or subscription occurs. These messages include date and time, the IP address  
30 of the user requesting the download, and the name and serial number of the user (if available). Alternatively, the updating mechanism can post information to a log file on a web server through a common gateway interface (CGI).



### Editing Manager

In addition to an initial filter database and future updates, the filtering system has an editing Manager that allows the user to edit the database to add, delete, or  
5 modify filters in the database. The editing filter allows the user to make custom changes if the user believes that the filtering system is filtering too much or too little. The editing manager is preferably separately password protected. The system allows each filter to be examined in-  
10 dividually.

The implementation and use of the editing manager are generally based on known database editing techniques. In addition, during a session over the Internet, a user can copy URLs for later editing. The user can then copy those  
15 URLs for inclusion in the database, or can edit the entry, e.g., to change the action from allow to block or vice versa.

### Server-based System

20 Referring again to Fig. 1, according to another embodiment of the present invention, the filtering system can be provided from a server 30 that is on the client's own network 40. Such a topology may be more desirable, for example, in a corporate network that has a limited size and a  
25 uniform set of filters for many users. This version of the filtering system uses the same type of filter database as a client-based filtering system, but the filter database is located on server 30.

The server-based system preferably has several other  
30 differences. Because a server environment may not have ready access to the Internet's domain name services, and because efficiency is important, an application produces its own domain name table for rapidly converting a domain name into a unique 32-bit number (typically an IP address). To  
35 make this conversion, the domain name is hashed, and the hash is used to locate a list of symbol table entities with



matching hash values. This list is searched associatively for an entry which matches the domain name being looked up. If found, the entry contains the unique 32-bit value.

An algorithm for pattern matching as described above  
5 may not be efficient enough for a server environment, and therefore an alternative search technique is preferably employed. First, a large list of representative URLs are analyzed to determine the frequency of combinations of characters, preferably two characters at a time. The resulting  
10 frequency information is stored in a Diphthong Frequency Table (DFT) that associates character combinations and their frequency.

Next, each filter pattern for each filter entry is searched to determine the character combination that is the  
15 least frequent according to the DFT. The pattern and a signed integer offset are used to calculate the start of the pattern from the location of the character combination being matched. The character combination and the filter pattern are used to make an entry in a probe table. The probe table  
20 is indexed by the character combination, and the indexed entry points to a list of patterns are characterized by that combination. In other words, each filter pattern is analyzed to find a character combination, preferably a character pair, that is least likely to occur in a target URL.  
25 The filter pattern is then stored in the probe table according to that least likely character combination.

Pattern matching is then accomplished by comparing each specified character combination in the candidate string to the entries in the probe table. Since commonly used character combinations will normally produce no hits in the probe  
30 table, the number of full string comparisons which need to be made is minimized.

As an example, assume a user enters a string that includes a series of letters, and the character combinations  
35 of interest are character pairs. The system successively checks the probe table for each pair of characters in the



string, and for each of these pairs, if a string on the list of filters has one of these pairs that is least common, the system performs a comparison of the entire strings. Because some of the character pairs in the string will be common, it will be unnecessary to make comparisons for these pairs. Thus, by searching according to least common character pairs, the number of comparisons is substantially reduced.

#### Patching Code

10       The filtering system provides patching code for the client computer's operating system. This code is different for a Windows-based system and for a Macintosh-based system.

For a Macintosh-based system, when a PBControl call is made, the parameters that are passed include a function selection variable that is compared to a bit vector containing values for all possible values of the function selector. If the bit vector has 0, no further filtering system code is executed, and the command is executed normally; if it is 1, the filtering system code is called before the normal command is executed. If the filtering system needs to take action after the normal execution of a command but before control is returned to the calling application, the stack of the application is modified so that when a return is made from the normal execution of the code, control goes to the filtering system patching code, and then returns to the application normally so that the application is not aware that the filtering system has been called.

In some cases, a command may be executed asynchronously. So far as the application is concerned, the call returns and sometime later a completion routine is executed. In this case, the filtering system creates a dummy piece of code that gets executed at completion time, and then correspondingly executes the application's completion routine in a manner that makes the presence of the filtering system undetectable, except for any blocking action that might be taken.



Referring to Fig. 5(a), in a typical system without patching, an application 40, such as a web browser, has call instructions 41. A routine 42 has an entry point 44, a series of instructions 46, and a return 48 to the next instruction 50 after the call. Application 40 calls the routine, instructions 44-48 are executed, and control returns to the application.

Referring to Fig. 5(b), under Windows 3.1 and 16-bit subsystems of Windows 95 (generally referred to as Win16), a Winsock API is patched by identifying all relevant entry points 54 and replacing them with a jump instructions to patch code 56, identified here as "filtering." Patch code 56 implements all head processing 60 which must take place before calling the application's call 58. Such head processing can include matching a port and a URL or IP address to filters in the database. The entry point of the instruction is reset to its original state in instruction 62 and the patch code has a call 64 to the patched routine 66 as a subroutine. After instructions 68, patched routine 66 has a return 70 to patch code 56. Patch code 56 has instructions 72 to re-replace entry 54 with a jump to the filtering patch code instructions 74 to perform tail processing (such a further filtering actions or blocking actions), and a return 76 to a next instruction 78 in the application. These patches are referred to here as soft patches and are generally known.

These soft patches can, however, have drawbacks with some operating systems, including Windows 95. Because the instructions have variable length, the initial replacement of the entry point in the originally called routine 66 may include only part of the first instruction or may include the first instruction and part of a second. Moreover, with a multitasking operating system, there is a period of time between instructions 62 and 72 when entry point 54 does not have a jump. Consequently, the filtering system could lose



control during this time if another application calls that routine.

Referring to Fig. 5(c), to address these matters, other patches, referred to here as hard patches, are put in place. A hard patch to a routine 80 is achieved by copying to a buffer 82 the first several instructions 84 beginning with the entry point of routine 80. To determine which instructions are copied, instructions 84 are identified and selected so that the copied instructions have a minimum total length in bytes and an even number of bytes. These instructions are then modified if needed to operate in the buffer. Entry point 84 of routine 80 is replaced with a jump instruction to a head processing routine 86. After the head processing is a jump instruction 88 to buffer 82. Instructions 84 are executed and then routine 80 is modified so its return 90 points to tail processing 92. Next, an instruction 94 is added at the end of private buffer 82 to jump back into patched routine 80 a next instruction 96 after the jump. After return 90, processing returns to tail processing routine 92, which returns to the calling application that is unaware the filtering system has been called.

Such hard patches are generally used to patch when applications are created or loaded. These include the LoadModule system calls for Win16; and CreateProcess, LoadLibrary, and GetProcAddress in 32-bit portions of Windows (referred to generally as Win32), such as Windows 95.

Referring to Fig. 5(d), to patch the Winsock API with Win32, an application's dll import table 200 is patched to replace Winsock calls with filtering system calls 202. These calls point to head processing 204. Next, a call 206 points to entry 208 of the original Winsock routine 210. After a return 212, the system performs tail processing 214 as necessary. Control then is returned to the application.

To inject patching code into the address space of a Winsock client without the need to modify or alter the library stored on disk, the following method is used:



(1) during head processing of the CreateProcess call, the arguments are modified to create the process in an initially suspended state; (2) during tail processing of the CreateProcess call, the modules loaded into the address space of the new process are examined, and if WSOCK32 has been loaded, the patching code is injected; (3) to activate the injecting code, the original entry point of the process on the stack is pushed to act as a call return address and the initial instruction pointer at a routine that loads filtering system code into memory and patches the applications import table is pointed to the routines of the filtering system; (4) if during tail processing of the LoadLibrary routine, WSOCK32 has been loaded by an application which is dynamically linking to Winsock (or a loaded library is implicitly linked to WSOCK32), a loading/patching routine is called; and (5) if an application dynamically links to WSOCK32 using the above LoadLibrary method, all calls to GetProcAddress are identified and the address of filtering system routines are returned to gain control of the API.

A Windows 3.1 application is installed to a publicly known directory with redundant duplicate hidden files in the DOS and Windows directories. To activate the filtering system, which is implemented as a monolithic executable program containing both the control panel and the blocking code, an item is added to the Startup menu, and a line is added to the WIN.INI file. Additionally, the file system.drv is replaced with a new system.drv that loads the original system.drv and aliases all of its entry points to point to the original routines. Additionally a "soft" hook is placed on a WinExec call so that the first time this routine is called, the filtering system is run and WinExec is unhooked.

These measures are also taken on Windows 95. Additionally, the control code and the blocking code are separated so that the control panel loads the blocking routines and provides on/off functionality, while the system.drv hook



loads both 16-bit blocking library routines and 32-bit library routines. To activate the filtering system, a reference to the executable program is added to the "RunServices" registry key so that the operating system automatically executes the program on startup.

Once the filtering system library routine is loaded, it cannot be unloaded. Therefore, if a user kills the program by re-booting, the blocking mechanisms are left intact.

Having described preferred embodiments of the present invention, it should be apparent that other modifications can be made without departing from the scope of the invention as set forth in the appended claims. For example, the present invention can be readily adapted to new protocols, or updated versions of other protocols, such as new versions of the Internet Protocol.

What is claimed is:

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Claims

Self A1 > 1. A method for communicating with servers over the Internet, the method comprising computer-implemented steps of:

- 5 (a) opening a data stream to send a message through an interface to an Internet server;  
(b) maintaining a database of filtering information;  
(c) comparing information in the message to filtering information in the database; and  
10 (d) determining whether to prevent or allow the outgoing transmission of the message based on the comparison.

2. The method of claim 1, wherein step (b) includes maintaining a table of filters, and wherein some of the fil-  
15 ters indicate that the message should be sent, and others indicate that the message should be blocked.

3. The method of claim 1, wherein step (b) includes maintaining filters that specify an interface port, an In-  
20 ternet Protocol (IP) address, and an action to be taken if the filtering information matches the information in the message.

4. The method of claim 1, wherein step (c) includes  
25 comparing an Internet Protocol (IP) address of the message to the filtering information.

5. The method of claim 1, wherein the message includes a URL request, and step (c) includes comparing a domain name  
30 in the URL to the filtering information.

6. The method of claim 5, wherein step (c) includes comparing file and/or directory information in the URL to the filtering information.



7. The method of claim 1, wherein step (c) includes comparing a command after a connection has been opened to the filtering information.

8. The method of claim 1, wherein steps (a)-(d) are all performed by a client computer, step (b) including maintaining the database in storage residing on the client computer.

9. The method of claim 1, wherein steps (a), (c), and (d) are performed by a client computer, and wherein step (b) includes maintaining the database on a server, the server being coupled to the client computer through a network.

Sub A2  
10. The method of claim 9, wherein step (c) includes comparing strings in the message against strings in filter entries in the filter database, the strings in the filter database being maintained based on the least common string in the filter entry.

11. The method of claim 1, further comprising a step of updating the database by downloading new filtering information from an update server, the update server being accessible to client computers over the Internet.

12. The method of claim 11, wherein the updating step includes replacing at least some of the information previously stored in the database.

Sub A3  
13. The method of claim 1, wherein the message includes a URL, wherein step (c) includes comparing a command in the URL to the filtering information.

14. The method of claim 1, wherein steps (a)-(d) are implemented on a server in a network to allow and block



transmissions to the Internet from clients coupled to the network.

- 15 15. A method for filtering messages transmitted over the Internet, the method comprising computer-implemented steps of:
- (a) maintaining a database of filter information;
  - (b) comparing information in an Internet message with the filter information;
  - 10 (c) determining whether to prevent or allow transmission of the message in response to the comparison; and
  - (d) updating the filtering information by downloading from a remote server via the Internet new filter information for storage in the database of filter information.

15

16. The method of claim 15, wherein step (d) includes replacing the existing filter information with the new filter information.

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17. The method of claim 15, wherein the update server has a number of sets of new filter information, the method further including a step of providing to the server a message indicating which set of filters to download.

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18. A method for communicating with servers over the Internet, the method comprising computer implemented steps of:

- (a) sending messages to and receive messages from an Internet server through an interface;
- 30 (b) maintaining a database of filtering information;
- (c) comparing information in the messages to filtering information in the database; and
- (d) determining whether to prevent or allow transmission of the messages based on the comparison, wherein steps
- 35 (a)-(d) are performed by a client computer connected to the Internet through a network server.



19. The method of claim 17, in response to a determination to block the incoming message, the method further comprising steps of buffering the incoming message in a buffer, discarding at least part of the incoming message, and displaying a message indicating that the message was blocked.

20. The method of claim 18, wherein step (b) includes maintaining a set of filters that have information relating to a direction of transmission, a pattern to be matched, and an action to be taken.

21. The method of claim 18, step (c) including comparing, by a client computer, an outgoing message transmitted to the Internet, wherein if step (d) includes determining that transmission is to be blocked, the method further comprising steps of queueing the filtering information, and blocking the incoming message from the recipient of the outgoing message.

22. A method comprising computer-implemented steps of:

- Sub A 5
- (a) copying instructions from an entry point of a called routine to a buffer;
  - (b) an application calling the called routine;
  - (c) jumping from the called routine to a head processing routine;
  - (d) performing the head processing routine;
  - (e) jumping to the buffer;
  - (f) executing the copied instructions;
  - (g) returning to the called routine after the jump of step (c);
  - (h) returning to a tail processing routine;
  - (i) performing the tail processing routine; and
  - (j) returning to the calling application.



23. The method of claim 22, wherein the computer includes storage for maintaining a database of filtering information, and a processor for accessing the storage, wherein step (d) includes steps of accessing the database  
5 for filtering information, and comparing a message being transmitted between the computer and the Internet to the filtering information.

24. The method of claim 23, wherein step (i) includes  
10 blocking the transmission in response to the comparison in step (d).

25. The method of claim 22, wherein step (a) includes identifying instructions and copying a number of instructions with a minimum number of total bytes.  
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26. The method of claim 22, further comprising injecting filtering code into an address space of an application that accesses the Internet so that code from a library is  
20 patched without altering the code in non-volatile memory, the computer using the filtering code to compare filtering information to messages being transmitted over the Internet.

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## INTERNET FILTERING SYSTEM

### Abstract of the Disclosure

A client-based filtering system compares portions of  
5 incoming and/or outgoing messages to filtering information  
in a filter database, and determines whether to block or  
allow incoming and/or outgoing transmissions of messages in  
response to the comparison. In response to a match between  
the portion of the message and the filtering information,  
10 the system can employ one of a number of different specified  
blocking options. The system has an update server that is  
accessible over the Internet and that has new filtering in-  
formation for updating the filter database. The filter da-  
tabase can have a filter database stored on a server in a  
15 network coupled to the client.

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**COMBINED DECLARATION AND  
POWER OF ATTORNEY FOR PATENT APPLICATIONS**

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below adjacent 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 inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled INTERNET FILTERING SYSTEM, the specification of which:

- ☒ is attached hereto;
- ☐ was filed as United States Application Serial No. \_\_\_\_\_ on \_\_\_\_\_ and was amended on \_\_\_\_\_ (if applicable).
- ☐ was filed as PCT International Application Number \_\_\_\_\_, on the \_\_\_\_\_ day of \_\_\_\_\_.
- ☐ an English translation of which is filed herewith.

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 appoint the following attorney(s) and/or agents to prosecute the above-identified application and transact all business in the Patent and Trademark Office connected therewith:

James B. Lampert,	Reg. No. <u>24,564</u>
Wayne M. Kennard,	Reg. No. <u>30,271</u>
Michael J. Bevilacqua,	Reg. No. <u>31,091</u>
James F. Kurkowski	Reg. No. <u>35,923</u>
Michael A. Diener,	Reg. No. <u>37,122</u>
Donald R. Steinberg,	Reg. No. <u>37,241</u>

6



All correspondence should be sent to:

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Hale and Dorr  
60 State Street  
Boston, Massachusetts 02109

Telephone No.: (617) 526-6000

Facsimile No.: (617) 526-5000

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 issuing thereon.

Full name of first inventor: William S/Duvall 1-00

Inventor's signature \_\_\_\_\_ Date \_\_\_\_\_

Citizenship: USA:

Residence and Postal Address: 140 Campo Drive, Portola Valley, California, 94020

Full name of secon inventor: Matthew Kendall

Inventor's signature \_\_\_\_\_ Date \_\_\_\_\_

Citizenship: USA:

Residence and Postal Address: 619 Webster Street, Palo Alto, California, 94301



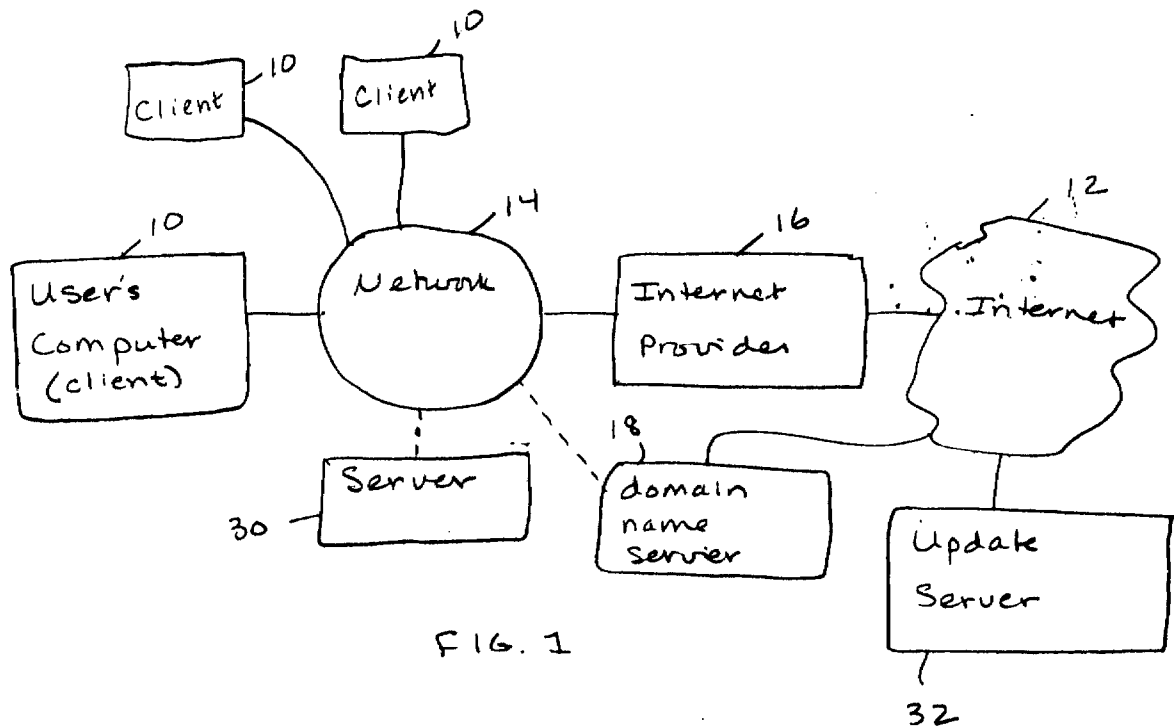


FIG. 1

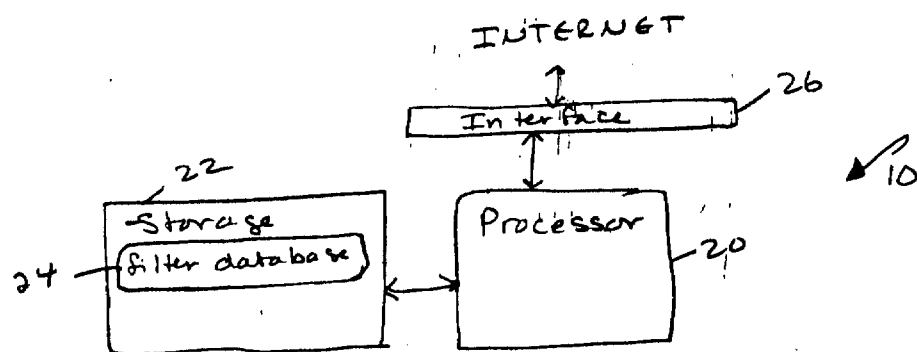


FIG. 2



PRINT OF DRAWINGS  
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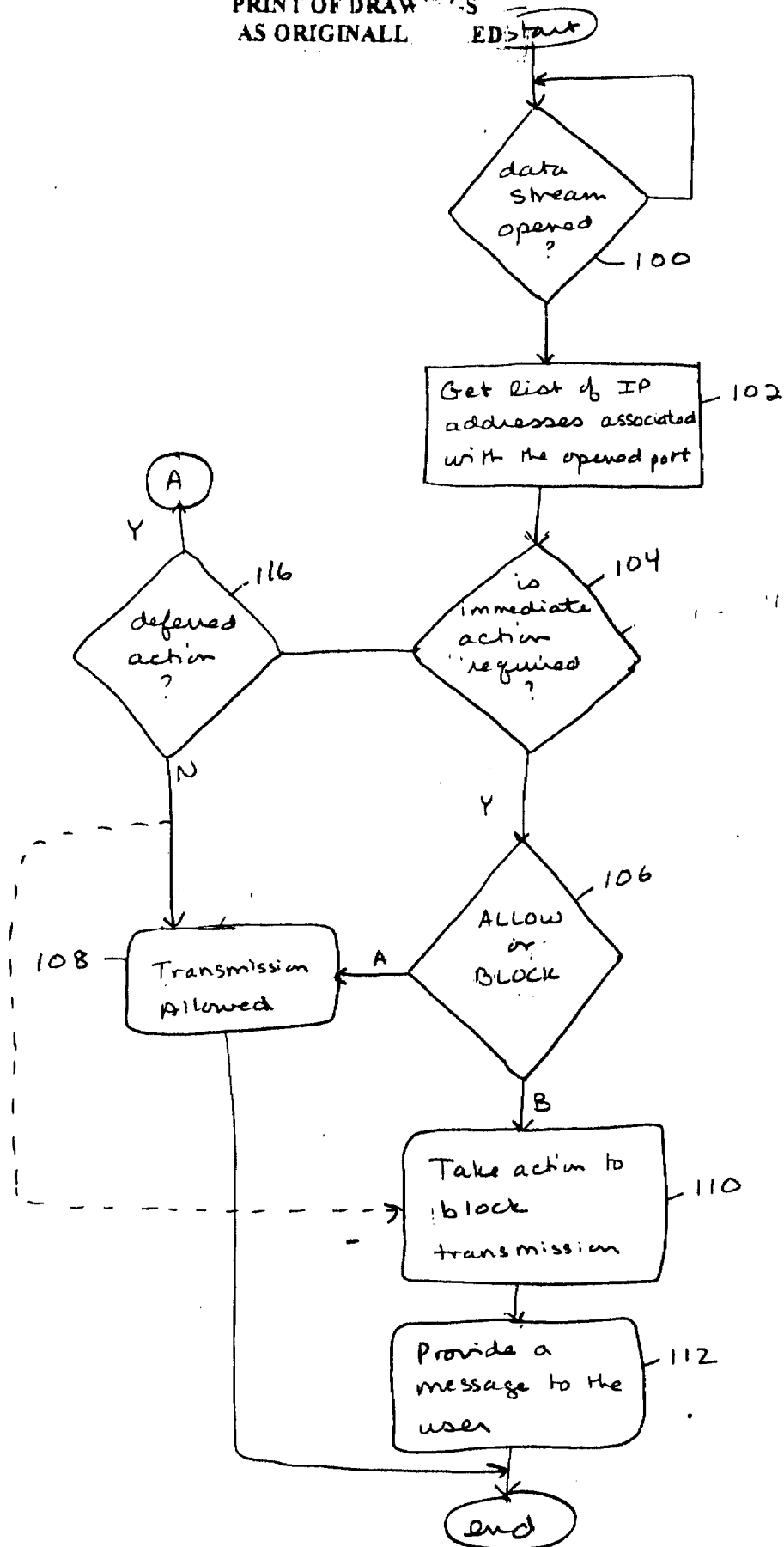


FIG. 3



PRINT OF DRAWINGS  
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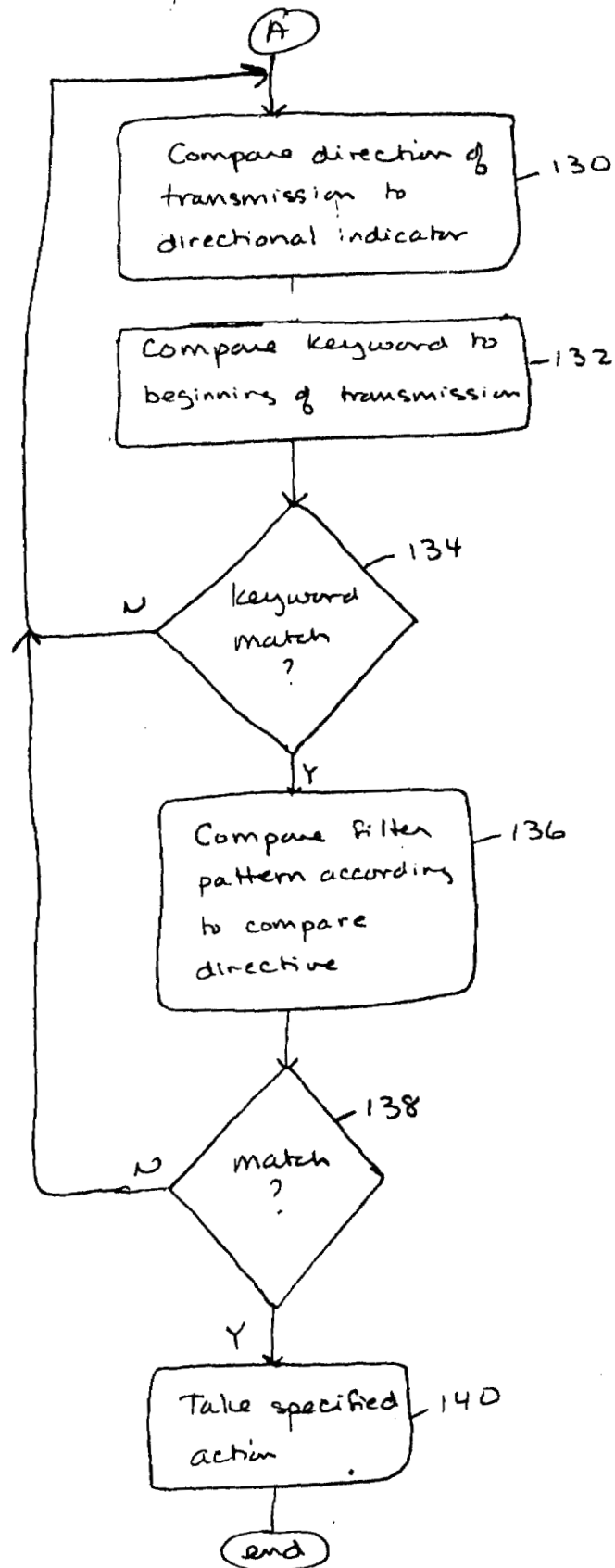


FIG. 4



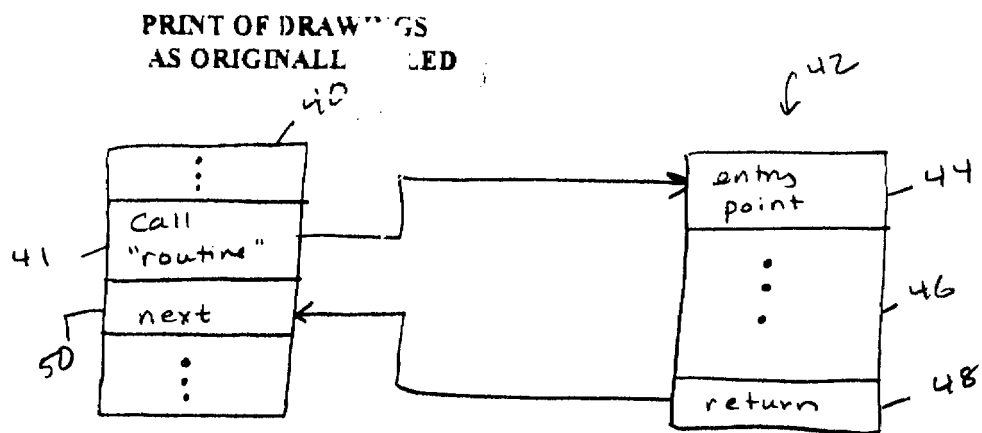


Fig. 5(a)  
(PRIOR ART)

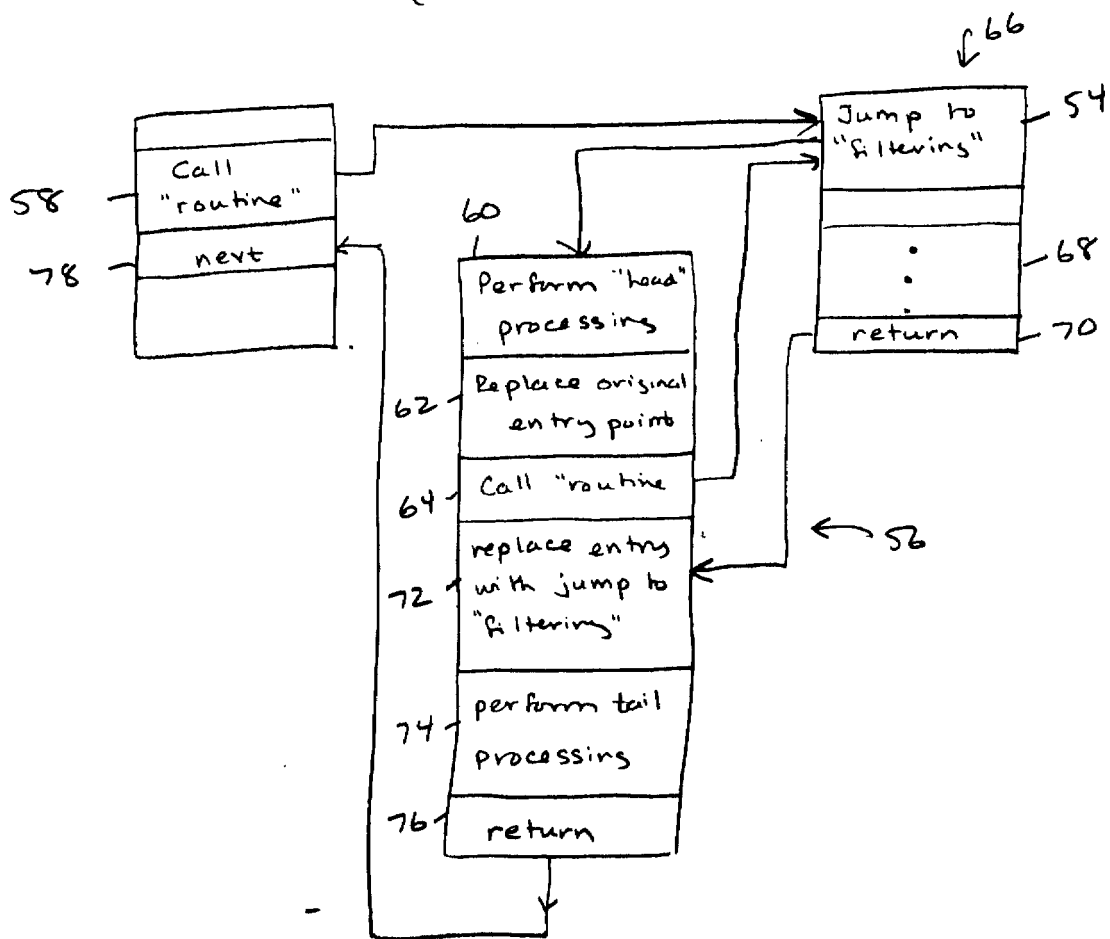


Fig. 5(b)



PRINT OF DRAWINGS  
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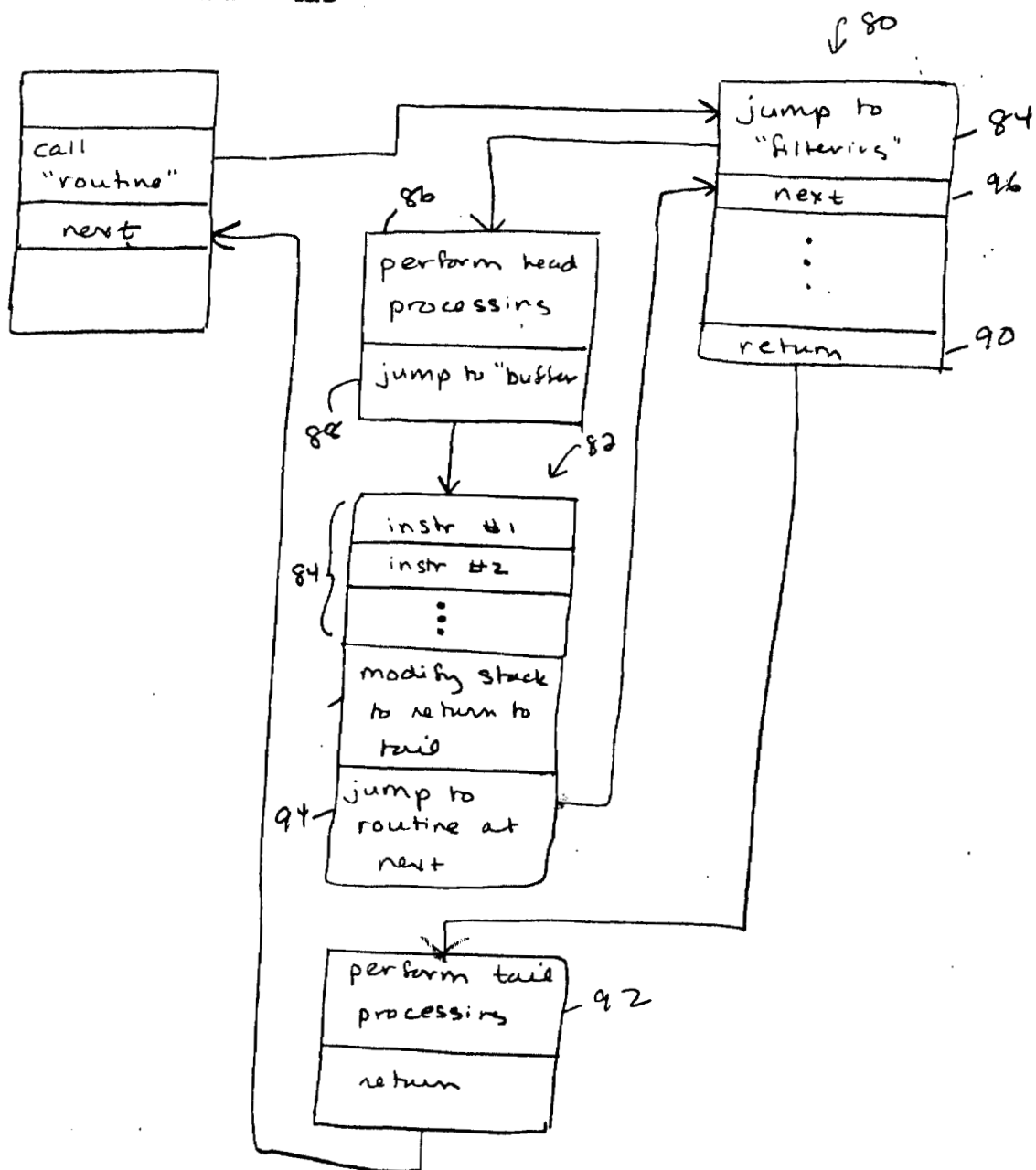


Fig. 5(c)



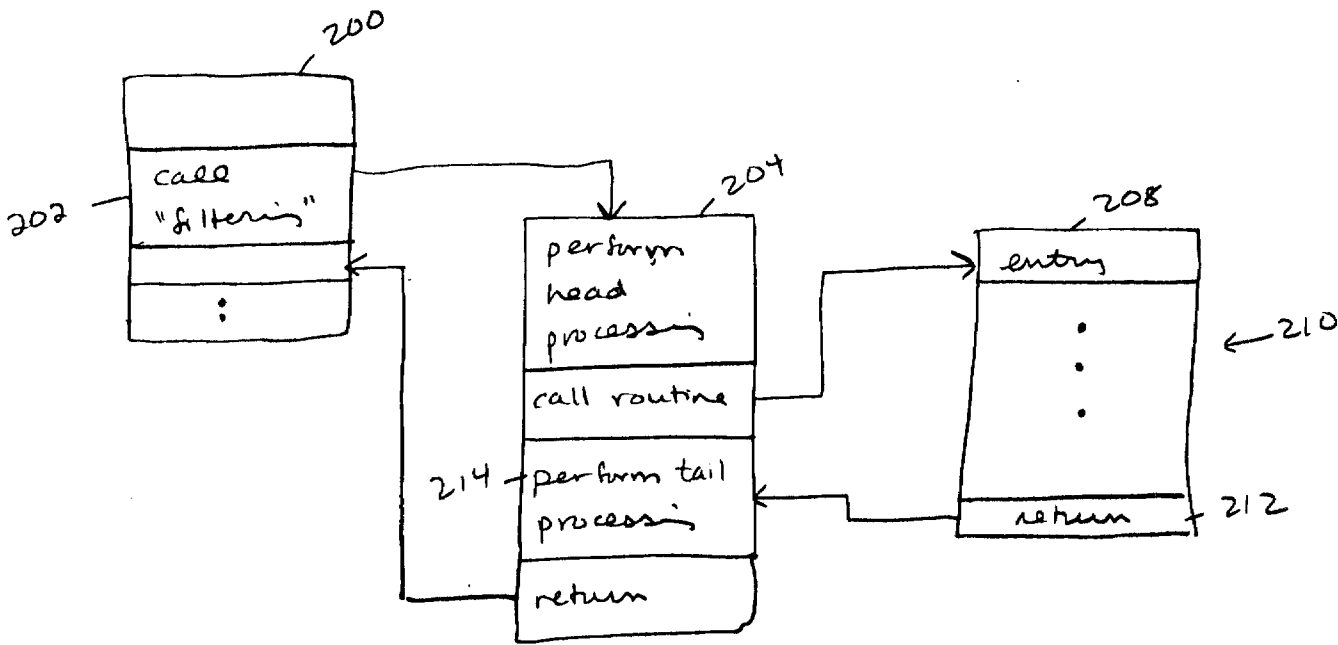


Fig. 5(d)





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APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
08/645,636	05/15/96	DUVALL	W 103,728,127

0242/0712

MICHAEL J BEVILACQUA  
HALE AND DORR  
60 STATE STREET  
BOSTON MA 02109

0000

DATE MAILED:

07/12/96

### 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<sup>00</sup> for large entities or \$ 65<sup>00</sup> for small entities who have filed a verified statement claiming such status. The surcharge is set forth in 37 CFR 1.16(e).

If all required items on this form are filed within the period set below, the total amount owed by applicant as a ☐ large entity, ☐ small entity (verified statement filed), is \$ 960<sup>00</sup>.

Applicant is given **ONE MONTH FROM THE DATE OF THIS LETTER, OR TWO MONTHS FROM THE FILING DATE** of this application, **WHICHEVER IS LATER**, 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).

- ☒ The statutory basic filing fee is: ☒ missing ☐ insufficient. Applicant as a ☐ large entity ☐ small entity, must submit \$ 750<sup>00</sup> to complete the basic filing fee.
- ☒ Additional claim fees of \$ 210<sup>00</sup> as a ☐ large entity, ☐ small entity, including any required multiple dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due.
- ☐ The oath or declaration:  
☐ is missing.  
☐ does not cover the newly submitted items.  
  
An oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date is required.
- ☐ The oath or declaration does not identify the application to which it applies. An oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.
- ☒ The signature(s) to the oath or declaration is/are: ☒ missing; ☐ by a person other than the inventor or a 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.
- ☐ 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.
- ☐ The application was filed in a language other than English. Applicant must file a verified English translation of the application and a fee of \$ \_\_\_\_\_ under 37 CFR 1.17(k), unless this fee has already been paid.
- ☐ A \$ \_\_\_\_\_ processing fee is required since your check was returned without payment. (37 CFR 1.21(m)).
- ☐ Your filing receipt was mailed in error because your check was returned without payment.
- ☐ The application does not comply with the Sequence Rules. See attached Notice to Comply with Sequence Rules 37 CFR 1.821-1.825.
- ☐ Other.

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**COMBINED DECLARATION AND  
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As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below adjacent 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 inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled INTERNET FILTERING SYSTEM, the specification of which:

- ☐ is attached hereto;
- ☒ was filed as United States Application Serial No. 08/645,636 on May 15, 1996 and was amended on \_\_\_\_\_ (if applicable).
- ☐ was filed as PCT International Application Number \_\_\_\_\_, on the \_\_\_\_\_ day of \_\_\_\_\_.
- ☐ an English translation of which is filed herewith.

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I hereby appoint the following attorney(s) and/or agents to prosecute the above-identified application and transact all business in the Patent and Trademark Office connected therewith:

James B. Lampert,	Reg. No. <u>24,564</u>
Wayne M. Kennard,	Reg. No. <u>30,271</u>
Michael J. Bevilacqua,	Reg. No. <u>31,091</u>
James F. Kurkowski	Reg. No. <u>35,923</u>
Michael A. Diener,	Reg. No. <u>37,122</u>
Donald R. Steinberg,	Reg. No. <u>37,241</u>



All correspondence should be sent to:

Michael J. Bevilacqua, Esq.  
Hale and Dorr  
60 State Street  
Boston, Massachusetts 02109

Telephone No.: (617) 526-6000  
Facsimile No.: (617) 526-5000

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 issuing thereon.

100  
Full name of first inventor: William S. Duvall

Inventor's signature [Signature] Date 6/7/96

Citizenship: USA:

Residence and Postal Address: 140 Campo Drive, Portola Valley, California, 94020

200 CA  
Full name of secon inventor: Matthew Kendall

Inventor's signature [Signature] Date 6/7/96

Citizenship: USA:

Residence and Postal Address: 619 Webster Street, Palo Alto, California, 94301  
CA





5-201-  
105-203-  
65-205-

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): William S. Duvall and Matthew Kendall

Serial No.: 08/645,636

Filed: May 15, 1996

For: INTERNET FILTERING SYSTEM

Assistant Commissioner for Patents  
Box Missing Parts  
Washington, DC 20231

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105.00 00  
50.00 00


TRANSMITTAL LETTER

Enclosed for filing are the following document(s):

1. Copy of Notice of Missing Parts.
2. Combined Declaration and Power of Attorney for Patent Applications.
3. Verified Statement (Declaration) Claiming Small Entity Status (37 CFR 1.9(d) and 1.27(c)) - Small Business Concern.

A check for \$545.00 is enclosed. Please charge any additional fee or credit any excess to our deposit account no. 08-0219.

Respectfully submitted,

  
Michael A. Diener  
Reg. No. 37,122  
Attorney for Applicants

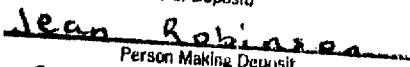
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Boston, MA 02109  
(617) 526-6454

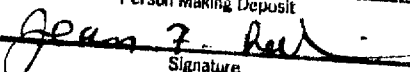
July 31, 1996

Attorney Docket No.: 103.728.127

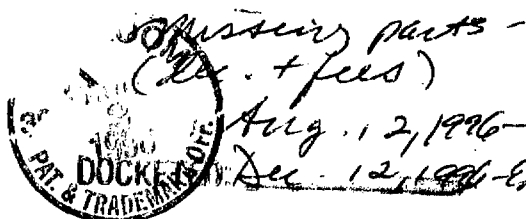
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APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
007545,636	05/15/96	DUVALL	VI 103,720,127

0242/0712

MICHAEL J. DEVLACQUA  
HALL AND BURN  
20 STATE STREET  
BOSTON, MA 02109

0000

DATE MAILED:

07/12/96

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If all required items on this form are filed within the period set below, the total amount owed by applicant as a ☐ large entity, ☐ small entity (verified statement filed), is \$ 120<sup>00</sup>.

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- ☒ The statutory basic filing fee is: ☒ missing ☐ insufficient. Applicant as a ☐ large entity ☐ small entity, must submit \$ 150<sup>00</sup> to complete the basic filing fee.
- ☒ Additional claim fees of \$ 210<sup>00</sup> as a ☐ large entity, ☐ small entity, including any required multiple dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due.
- ☐ The oath or declaration:  
☐ is missing.  
☐ does not cover the newly submitted items.  
  
An oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date is required.
- ☐ The oath or declaration does not identify the application to which it applies. An oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.
- ☒ The signature(s) to the oath or declaration is/are: ☒ missing; ☐ by a person other than the inventor or a 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.
- ☐ 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.
- ☐ The application was filed in a language other than English. Applicant must file a verified English translation of the application and a fee of \$ \_\_\_\_\_ under 37 CFR 1.17(k), unless this fee has already been paid.
- ☐ A \$ \_\_\_\_\_ processing fee is required since your check was returned without payment. (37 CFR 1.21(m)).
- ☐ Your filing receipt was mailed in error because your check was returned without payment.
- ☐ The application does not comply with the Sequence Rules. See attached Notice to Comply with Sequence Rules 37 CFR 1.821-1.825.
- ☐ Other.

Direct the response to Box Missing Part and refer any questions to the Customer Service Center at (703) 308-1202.

Apple 1007.0044

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

COPY TO BE RETURNED WITH RESPONSE





Attorney Docket No.

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant : William S. Duvall and Matthew Kendall  
Serial No. : 08/645,636  
Filing Date : May 15, 1996  
Titled : INTERNET FILTERING SYSTEM

**VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY  
STATUS (37 CFR 1.9(d) and 1.27(c)) - SMALL BUSINESS CONCERN**

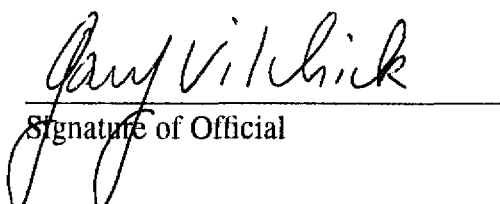
I declare that I am an official of, and am empowered to act on behalf of, Spyglass, Inc., a Delaware corporation, which qualifies as a small business concern as defined in 37 CFR 1.9(c) for purposes of paying reduced fees under Sections 41(a) and (b) of Title 35 U.S.C., to the Patent and Trademark Office with regard to the above-identified invention.

Spyglass has exclusive rights to the invention and has not assigned, granted, conveyed or licensed, and is under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person or entity that could not be classified as a small entity under 37 CFR 1.9(c)-(e).

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 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 Official: Gary Vilchick  
Title of Official: Chief Financial Officer

  
Signature of Official

Date 7/26/96



08/645,636


**UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office**

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

NM

APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
08/645,636	05/15/96	DUVALL	W 103.728.127

B3M1/0708

 MICHAEL J BEVILACQUA  
HALE AND DORR  
60 STATE STREET  
BOSTON MA 02109

EXAMINER

VU, V

ART UNIT PAPER NUMBER

2315

4

DATE MAILED: 07/08/97

 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 5-15-96
- ☐ 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; 463 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) 1-26 is/are pending in the application.
- Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- ☒ Claim(s) 1-26 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

Apple 1007.0046

-- SEE OFFICE ACTION ON THE FOLLOWING PAGES --



Serial No. 08/645,636

**DETAILED ACTION**

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

**Non-Art rejections:**

2. Claims 22-26 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The following language is vague and indefinite:

In claim 22, it is not clear as to which function the claimed "computer implemented" steps perform.

The examiner further suggests applicant to provide line numbers in the claims. A preferred format is to number each line of every claim, with each claim beginning with line one. For ease of reference by both examiner and applicants all future correspondence should include the recommended line numbering.

**Art Rejections:**

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

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or



Serial No. 08/645,636

on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

4. Claims 1-5, 7, 9-10 and 14 are rejected under 35 U.S.C. § 102(e) as being clearly anticipated by Shwed, U.S. pat. no. 5,606,668.

Shwed discloses the claimed invention, a system and method of filtering data packets communicated in a computer network (see abstract of Shwed). In particular, the method comprises the steps of:

- (a) providing a plurality of packet filters (fig. 2) at host servers and client workstations (col 3, line 44 - col 4, line 15),
- (b) generating/maintaining a database of filtering information for the packet filters (figures 3a, 3b) including service names, ports, network addresses and actions to be taken (col 4, line 43 - col 5, line 21),
- (c) transferring/downloading the generated filtering information for storage in tables of the corresponding packet filters (col 4, lines 16-33),
- (d) opening a data stream for sending/receiving data packets through an interface including multiple communication layers (502, fig. 5) (col 7, lines 14-17),



Serial No. 08/645,636

(e) comparing (524, fig. 5) information in a data packet, e.g. IP address, to filtering information in the packet filter (col 7, lines 18-20),

(f) determining (534, fig. 5) whether to block or allow the inbound/outbound transmission of the data packet based on the comparison (see col 7, lines 20-46 of Shwed).

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

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 negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103, the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 C.F.R. § 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of potential 35 U.S.C. § 102(f) or (g) prior art under 35 U.S.C. § 103.



Serial No. 08/645,636

7. Claims 6, 8, 11-13 and 15-26 are rejected under 35 U.S.C. § 103 as being unpatentable over Shwed.

As to claims 6 and 13, Shwed discloses the packet filter system and method substantially as claimed as discussed above. Shwed does not explicitly teach comparing a file, a directory or a command in the URL against the filtering information in the packet filter.

It would have been logical/self-evident to one of ordinary skill in the art at the time the invention was made to utilize such filtering information because it would have providing another level of protection by enabling the server/workstation to prevent certain files from being copied or altered by unauthorized users without having to blocking all data accesses to the server/workstation.

As to claims 8, 11-12 and 15-21, Shwed does not disclose maintaining a filtering database at the client workstation.

It would have been obvious to one of ordinary skill in the art at the time the invention was made implement a database, i.e. a larger filtering table, at the client workstation because it would have provided storage for storing filtering instructions for various levels of protection and/or different filtering capability at the client workstations.

It is noted that in Shwed the updated filtering information is provided from the host server (see col 4, lines 16-25 of Shwed).



Serial No. 08/645,636

As to claims 22-26, it would have been further obvious to one skilled in the art to implement Shwed's filter packet with either hardware circuitry or software routine. The use of software routine would have been motivated because it would have provided a cost advantage over the hardware alternative in implementing the filtering function and future upgrading, e.g., a "packet filter" routine would have been called by the application program for performing the data filtering function (head/tail processing) as discussed above (see fig. 5 of Shwed). An official notice is taken that the step of calling a sub-routine from a program and returning to the calling program after the execution of the called routine is well-known in the art.

**Conclusion:**

8. The following references cited by the examiner but not relied upon are considered pertinent to applicant's disclosure.

a. Vu, U.S. pat. no. 5,623,601: apparatus and method for providing a secure gateway for communications and data exchanges between networks.

b. Canale et al, U.S. pat. no. 5,619,648: message filtering techniques.

c. Nilakantan et al, U.S. pat. no. 5,541,911: remote smart filtering communication management system.



Serial No. 08/645,636

d. Agrawal et al, U.S. pat. no. 4,825,354: method of file access in a distributed processing computer network.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to V. Vu whose telephone number is (703) 305-9597.

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.



Viet Vu  
Art Unit 2315

6/27/97



TO SEPARATE, HOLD TOP AND BOTTOM EDGES, SNAP-APART AND DISCARD CARBON

FORM PTO-892 (REV. 2-92)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		SERIAL NO. 08/645,636		GROUP/ART UNIT 3315		ATTACHMENT TO PAPER NUMBER		4								
NOTICE OF REFERENCES CITED				APPLICANT(S) Duvall et al														
U.S. PATENT DOCUMENTS																		
*		DOCUMENT NO.						DATE		NAME		CLASS	SUB-CLASS	FILING DATE IF APPROPRIATE				
	A	5	6	2	3	6	0	1	4-23-97	Vu		395	187.01	11-21-94				
	B	5	6	1	9	6	4	8	4-8-97	Canale et al		395	200.236	11-30-94				
	C	5	6	0	6	6	6	8	2-25-97	Shweal		395	200.236	12-15-93				
	D	5	5	4	1	9	1	1	7-30-96	Nikantam et al		370	422	10-12-94				
	E	4	8	2	5	3	5	4	4-25-89	Agrawal et al		395	10	—				
	F																	
	G																	
	H																	
	I																	
	J																	
	K																	
FOREIGN PATENT DOCUMENTS																		
*		DOCUMENT NO.						DATE		COUNTRY		NAME		CLASS	SUB-CLASS	PERTINENT SHTS. DWG.		PP. SPEC.
	L																	
	M																	
	N																	
	O																	
	P																	
	Q																	
OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, Etc.)																		
	R																	
	S																	
	T																	
	U																	
EXAMINER ✓ Vu									DATE 6-27-97									
* A copy of this reference is not being furnished with this office action. (See Manual of Patent Examining Procedure, section 707.05 (a).) Apple 1007.0053																		



C45736

## NOTICE OF DRAFTSPERSON'S PATENT DRAWING REVIEW

PTO Draftpersons review all originally filed drawings regardless of whether they are designated as formal or informal. Additionally, patent Examiners will review the drawings for compliance with the regulations. Direct telephone inquiries concerning this review to the Drawing Review Branch, 703-305-8404.

The drawings filed (insert date) \_\_\_\_\_, are

- A. ☐ not objected to by the Draftsperson under 37 CFR 1.84 or 1.152.  
B. ☒ objected to by the Draftsperson under 37 CFR 1.84 or 1.152 as indicated below. The Examiner will require submission of new, corrected drawings when necessary. Corrected drawings must be submitted according to the instructions on the back of this Notice.

1. DRAWINGS. 37 CFR 1.84(a): Acceptable categories of drawings:  
Black ink. Color.

- ☐ Not black solid lines. Fig(s) \_\_\_\_\_  
☐ Color drawings are not acceptable until petition is granted.  
Fig(s) \_\_\_\_\_

2. PHOTOGRAPHS. 37 CFR 1.84(b)

- ☐ Photographs are not acceptable until petition is granted.  
Fig(s) \_\_\_\_\_  
☐ Photographs not properly mounted (must use bryistol board or photographic double-weight paper). Fig(s) \_\_\_\_\_  
☐ Poor quality (half-tone). Fig(s) \_\_\_\_\_

3. GRAPHIC FORMS. 37 CFR 1.84 (d)

- ☐ Chemical or mathematical formula not labeled as separate figure.  
Fig(s) \_\_\_\_\_  
☐ Group of waveforms not presented as a single figure, using common vertical axis with time extending along horizontal axis.  
Fig(s) \_\_\_\_\_  
☐ Individuals waveform not identified with a separate letter designation adjacent to the vertical axis. Fig(s) \_\_\_\_\_

4. TYPE OF PAPER. 37 CFR 1.84(c)

- ☐ Paper not flexible, strong, white, smooth, nonshiny, and durable.  
Sheet(s) \_\_\_\_\_  
☐ Frasures, alterations, overwritings, interlineations, cracks, creases, and folds copy machine marks not accepted. Fig(s) \_\_\_\_\_  
☐ Mylar, velum paper is not acceptable (too thin). Fig(s) \_\_\_\_\_

5. SIZE OF PAPER. 37 CFR 1.84(f): Acceptable sizes:

- 21.6 cm. by 35.6 cm. (8 1/2 by 14 inches)  
21.6 cm. by 33.1 cm. (8 1/2 by 13 inches)  
21.6 cm. by 27.9 cm. (8 1/2 by 11 inches)  
21.0 cm. by 29.7 cm. (DIN size A4)

- ☐ All drawing sheets not the same size. Sheet(s) \_\_\_\_\_  
☐ Drawing sheet not an acceptable size. Sheet(s) \_\_\_\_\_

6. MARGINS. 37 CFR 1.84(g): Acceptable margins:

Paper size

21.6 cm. X 35.6 cm. (8 1/2 X 14 inches)	21.6 cm. X 33.1 cm. (8 1/2 X 13 inches)	21.6 cm. X 27.9 cm. (8 1/2 X 11 inches)	21.0 cm. X 29.7 cm. (DIN Size A4)
T 5.1 cm. (2")	2.5 cm. (1")	2.5 cm. (1")	2.5 cm.
L .61 cm. (1/4")	.64 cm. (1/4")	.64 cm. (1/4")	2.5 cm.
R .64 cm. (1/4")	.64 cm. (1/4")	.64 cm. (1/4")	1.5 cm.
B .64 cm. (1/4")	.64 cm. (1/4")	.64 cm. (1/4")	1.0 cm.

Margins do not conform to chart above.

Sheet(s) \_\_\_\_\_

Top (T) \_\_\_\_\_ Left (L) \_\_\_\_\_ Right (R) \_\_\_\_\_ Bottom (B) \_\_\_\_\_

7. VIEWS. 37 CFR 1.84(h)

- REMINDER: Specification may require revision to correspond to drawing changes.  
☐ All views not grouped together. Fig(s) \_\_\_\_\_  
☐ Views connected by projection lines or lead lines.  
Fig(s) \_\_\_\_\_  
☐ Partial views. 37 CFR 1.84(h) 2

- ☐ View and enlarged view not labeled separately or properly.  
Fig(s) \_\_\_\_\_

Sectional views. 37 CFR 1.84 (h) 3

- ☐ Hatching not indicated for sectional portions of an object.  
Fig(s) \_\_\_\_\_

- ☐ Cross section not drawn same as view with parts in cross section with regularly spaced parallel oblique strokes. Fig(s) \_\_\_\_\_

8. ARRANGEMENT OF VIEWS. 37 CFR 1.84(i)

- ☐ Words do not appear on a horizontal, left-to-right fashion when page is either upright or turned so that the top becomes the right side, except for graphs. Fig(s) \_\_\_\_\_

9. SCALE. 37 CFR 1.84(k)

- ☐ Scale not large enough to show mechanism with crowding when drawing is reduced in size to two-thirds in reproduction.  
Fig(s) \_\_\_\_\_  
☐ Indication such as "actual size" or scale 1/2" not permitted.  
Fig(s) \_\_\_\_\_

10. CHARACTER OF LINES, NUMBERS, & LETTERS. 37 CFR 1.84(l)

- ☒ Lines, numbers & letters not uniformly thick and well defined, clean, durable, and black (except for color drawings).  
Fig(s) 1-50

11. SHADING. 37 CFR 1.84(m)

- ☐ Solid black shading areas not permitted.  
Fig(s) \_\_\_\_\_  
☐ Shade lines, pale, rough and blurred. Fig(s) \_\_\_\_\_

12. NUMBERS, LETTERS, & REFERENCE CHARACTERS. 37 CFR 1.84(p)

- ☐ Numbers and reference characters not plain and legible. 37 CFR 1.84(p)(i) Fig(s) \_\_\_\_\_  
☐ Numbers and reference characters not oriented in same direction as the view. 37 CFR 1.84(p)(i) Fig(s) \_\_\_\_\_  
☐ English alphabet not used. 37 CFR 1.84(p)(2) Fig(s) \_\_\_\_\_  
☒ Numbers, letters, and reference characters do not measure at least .32 cm. (1/8 inch) in height. 37 CFR(p)(3) Fig(s) \_\_\_\_\_

13. LEAD LINES. 37 CFR 1.84(q)

- ☐ Lead lines cross each other. Fig(s) \_\_\_\_\_  
☐ Lead lines missing. Fig(s) \_\_\_\_\_

14. NUMBERING OF SHEETS OF DRAWINGS. 37 CFR 1.84(t)

- ☐ Sheets not numbered consecutively, and in Arabic numerals, beginning with number 1. Sheet(s) \_\_\_\_\_

15. NUMBER OF VIEWS. 37 CFR 1.84(u)

- ☐ Views not numbered consecutively, and in Arabic numerals, beginning with number 1. Fig(s) \_\_\_\_\_  
☐ View numbers not preceded by the abbreviation Fig.  
Fig(s) \_\_\_\_\_

16. CORRECTIONS. 37 CFR 1.84(w)

- ☐ Corrections not made from prior PTO-948.  
Fig(s) \_\_\_\_\_

17. DESIGN DRAWING. 37 CFR 1.152

- ☐ Surface shading shown not appropriate. Fig(s) \_\_\_\_\_  
☐ Solid black shading not used for color contrast.  
Fig(s) \_\_\_\_\_

COMMENTS:

8/18/96



08/645,696



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.

EXAMINER	
ART UNIT	PAPER NUMBER
	5

DATE MAILED:

EXAMINER INTERVIEW SUMMARY RECORD

All participants (applicant, applicant's representative, PTO personnel):

(1) V. Vu (Examiner) (3) \_\_\_\_\_  
(2) Timothy Scott (4) \_\_\_\_\_  
Date of Interview 1/7/98

Type: ☐ Telephonic ☒ Personal (copy is given to ☐ applicant ☒ applicant's representative).

Exhibit shown or demonstration conducted: ☐ Yes ☒ No. If yes, brief description: \_\_\_\_\_

Agreement ☐ was reached with respect to some or all of the claims in question. ☒ was not reached.

Claims discussed: Claim 1

Identification of prior art discussed: showed

Description of the general nature of what was agreed to if an agreement was reached, or any other comments: discussed

differences between the present invention and prior art, i.e. deferred action filtering. The proposed amended claims appear to be distinguished over showed.

(A fuller description, if necessary, and a copy of the amendments, if available, which the examiner agreed would render the claims allowable must be attached. Also, where no copy of the amendments which would render the claims allowable is available, a summary thereof must be attached.)

Unless the paragraphs below have been checked to indicate to the contrary, A FORMAL WRITTEN RESPONSE TO THE LAST OFFICE ACTION IS NOT WAIVED AND MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW (e.g., items 1-7 on the reverse side of this form). If a response to the last Office action has already been filed, then applicant is given one month from this interview date to provide a statement of the substance of the interview.

☒ It is not necessary for applicant to provide a separate record of the substance of the interview.

☐ Since the examiner's interview summary above (including any attachments) reflects a complete response to each of the objections, rejections and requirements that may be present in the last Office action, and since the claims are now allowable, this completed form is considered to fulfill the response requirements of the last Office action.

[Signature]  
Examiner's Signature



JAN 5 '98 13:56 FR HALE AND DORR LLP  
E013002

2968 TO \*127#12023836619 P.02

22:11 06. 90 NBT

#  
11/11/98  
27

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

W.S. Duvall and M. Kendall

Serial No. 08/645,636

Filed: 15 May 1996

For: INTERNET FILTERING SYSTEM

Art Unit: 2315

Examiner: V. Vu

Atty. Docket: 06650-0002

Associate Power of Attorney

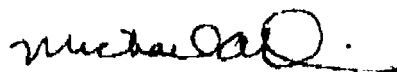
Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

The undersigned, Michael A. Diener, attorney of record in the present application, hereby appoints Timothy L. Scott, Registration No. 37,931, all members of the firm **Howrey & Simon**, Box No. 34, 1299 Pennsylvania Avenue, NW, Washington, D.C. 20004-2402, as Associate Attorney with full power to prosecute the above-identified application and to transact all business connected therewith in the U.S. Patent and Trademark Office.

Please address future correspondence to Timothy L. Scott at the above-noted address.

Respectfully submitted,

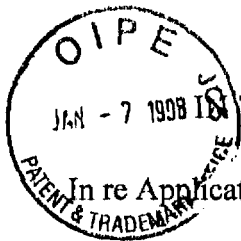


Michael A. Diener (Reg. No. 37,122)

Date: Jan. 5, 1998

Hale & Dorr  
60 State Street  
Boston, MA 02109  
(617) 526-6000





THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: W.S. Duvall  
M. Kendall

Serial. No. 08/645,636

Filed: May 15, 1996

For: Internet Filtering System

Art Unit: 2315

Examiner: V. Vu

Atty. Docket: 06650.0002

**Petition For Extension of Time Under 37 C.F.R. § 1.136**

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

It is hereby requested that the period for responding to the outstanding Office Action be extended three months from October 8, 1997 to January 8, 1998, by the filing of this Petition and fee payment.

The petition fee (37 C.F.R. §1.17(a)) is believed to be **\$475.00** for a three month extension for a small entity. Fee payment is provided in our accompanying Check No. **200760**. However, if extensions of time under 37 C.F.R. § 1.136 other than those provided herewith are required to prevent abandonment of the present patent application, then such extensions of time are hereby petitioned.

The U.S. Patent and Trademark Office is hereby authorized to charge any fee deficiency, or credit any overpayment, to our Deposit Account No. 08-3038. A duplicate copy of this Petition is enclosed.

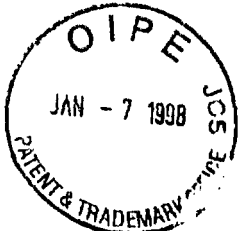
Respectfully submitted,

Timothy L. Scott  
Registration No. 37,931

Date: 1/7/98

HOWREY & SIMON  
Box No. 34  
1299 Pennsylvania Avenue, N.W.  
Washington, D.C. 20004-2402  
(202) 783-0800





#8/A  
**PATENT**  
Docket No. 06650.0002

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Inventor(s): W.S. Duvall; M. Kendall

Serial No.: 08/645,636

Filing Date: 15 May 1996

For: Internet Filtering System

Group Art Unit: 2315

Examiner: V. Vu

*Turner B*  
*1/22/98*

**AMENDMENT**

Assistant Commissioner for Patents  
Washington D.C. 20231

Sir:

This Amendment is in response to the Office Action mailed July 8, 1997. The deadline for response has been extended by the accompanying petition for three month extension of time to January 8, 1998.

Please amend the above-identified patent application as follows.

**In the Claims:**

Cancel claims 9, 14, 19, 20, and 21.

Please amend claims 1-7, 10, 11, 13, 15, 16, 17, 18, and 22 as follows:

- A* *Sub 2*
1. (Amended) A method for communicating with servers over the Internet, the method comprising computer-implemented steps of:
    - (a) opening a data stream to send a message through an interface to an Internet server;
    - (b) maintaining a database of filtering information comprising a table of filters, said table comprising
      - (1) filters specifying immediate action, and
      - (2) filters specifying deferred action;



- 9 (c) comparing information in the message to filtering information in  
10 the database; and  
11 (d) determining whether to prevent or allow the outgoing transmission  
12 of the message based on the comparison.

1 2. (Amended) The method of claim 1, wherein [step (b) includes  
2 maintaining a table of filters, and wherein] some of the filters indicate that the  
3 message should be sent, and others indicate that the message should be blocked.

1 3. (Amended) The method of claim 1, wherein in step (b) [includes  
2 maintaining filters that specify] the filters specifying immediate action comprise  
3 fields specifying an interface port, an Internet Protocol (IP) address, and an  
4 action to be taken if the filtering information matches the information in the  
5 message.

1 4. (Amended) The method of claim [1] 3, wherein step (c) includes  
2 comparing an Internet Protocol (IP) address of the message to the filtering  
3 information.

Sub B2 1 5. (Amended) The method of claim [1] 23, wherein the message includes a  
2 URL [request], and step (c) includes comparing a domain name in the URL to the  
3 filtering information.

1 6. (Amended) The method of claim 5, wherein step (c) includes comparing  
2 file [and/or directory] information in the URL to the filtering information.

Sub B3 1 7. (Amended) The method of claim [1] 23, wherein step (c) includes  
2 comparing a command after a connection has been opened to the filtering  
3 information.

Sub B4 1 10. (Amended) The method of claim [9] 23, wherein step (c) includes  
2 comparing strings in the message against strings in filter entries in the filter  
3 database, the strings in the filter database being maintained based on the least  
4 common string in the filter entry.



A<sub>2</sub> 1 11. (Amended) The method of claim [1] <sup>9</sup>8, further comprising a step of  
2 updating the database by downloading new filtering information from an update  
3 server, the update server being accessible to the client computer [computers]  
4 over the Internet.

A<sub>3</sub> Sub B<sub>5</sub> 1 13. (Amended) The method of claim [1] 23, wherein the message includes a  
2 URL, wherein step (c) includes comparing a command in the URL to the filtering  
3 information.

Sub B<sub>6</sub> 1 15. (Amended) A method for filtering messages transmitted over the  
2 Internet, the method comprising computer-implemented steps of:  
3 (a) maintaining a database of filtering information comprising a table  
4 of filters, said table comprising  
5 (1) filters specifying immediate action, and  
6 (2) filters specifying deferred action;  
7 (b) comparing information in the Internet message to filtering  
8 information in the database; and  
9 (c) determining whether to prevent or allow transmission of the  
10 message in response to the comparison; and  
11 (d) updating the filtering information by downloading from a remote  
12 server via the Internet new filter information for storage in the database of  
13 filter information].

1 16. (Amended) The method of claim [15] 25, wherein step (d) includes  
2 replacing the existing filter information with the new filter information.

1 17. (Amended) The method of claim [15] 25, wherein the update server has a  
2 number of sets of new filter information, the method further including a step of  
3 providing to the server a message indicating which set of filters to download.



1 18. (Amended) A method for communicating with servers over the Internet,  
2 the method comprising the computer implemented steps of:  
3 (a) sending messages to and [receive] receiving messages from an  
4 Internet server through an interface;  
5 (b) maintaining a database of filtering information comprising a table  
6 of filters, said table comprising  
7 (1) filters specifying immediate action, and  
8 (2) filters specifying deferred action;  
9 (c) comparing information in the messages to filtering information in  
10 the database; and  
11 (d) determining whether to prevent or allow transmission of the  
12 messages based on the comparison[.];  
13 wherein steps (a) – (d) are performed by a client computer connected to the  
14 Internet through a network server. (

1 22. (Amended) A method of executing a hard patch for a called computer  
2 routine comprising the computer-implemented steps of:  
3 (a) copying instructions from an entry point of a called routine to a  
4 buffer;  
5 (b) providing an application calling the called routine;  
6 (c) jumping from the called routine to a head processing routine;  
7 (d) performing the head processing routine;  
8 (e) jumping to the buffer;  
9 (f) executing the copied instructions;  
10 (g) returning to the called routine after the jump of step (c);  
11 (h) returning to a tail processing routine;  
12 (I) performing the tail processing routine; and  
13 (j) returning to the calling application.

Please add the following new claims: /



1 <sup>5</sup>  
27. (New) The method of claim 1, wherein in step (b) the filters specifying  
2 deferred action comprise fields specifying a keyword, a filter pattern, a compare  
3 directive, and an action to be taken if the filtering information matches  
4 information in the message.

1 <sup>14</sup>  
28. (New) The method of claim <sup>6</sup>8, wherein step (c) include comparing  
2 directory information in the URL to the filtering information.

1 <sup>16</sup>  
29. (New) The method of claim 15, further comprising a step (d) of updating  
2 the filtering information by downloading from a remote server via the Internet  
3 new filter information for storage in the database of filter information.

1 <sup>20</sup>  
30. (New) The method of claim <sup>19</sup>18, wherein step (d) comprises a  
2 determination to prevent transmission of the messages, the method further  
3 comprising steps of buffering the messages in a buffer, discarding at least part of  
4 the incoming messages, and displaying a message indicating that the  
5 transmission was prevented.

1 <sup>21</sup>  
31. (New) The method of claim <sup>19</sup>18, wherein in step (b) the filters specifying  
2 deferred action comprise fields specifying a keyword, a filter pattern, and an  
3 action to be taken if the filtering information matches information in the  
4 messages.

1 <sup>22</sup>  
32. (New) The method of claim <sup>19</sup>18, step (c) including comparing messages  
2 sent to the Internet, the method further comprising the step of queuing the  
3 filtering information.

1 33. (New) A method for communicating with servers over the Internet, the  
2 method comprising the computer-implemented steps of:  
3 (a) opening a data stream to receive a message through an interface  
4 from an Internet server;  
5 (b) maintaining a database of filtering information comprising a table  
6 of filters, said table comprising



- 7 (c) filters specifying immediate action, and  
8 (d) filters specifying deferred action;  
9 (e) comparing information in the message to filtering information in  
10 the database; and  
11 (f) determining whether to prevent or allow the incoming  
12 transmission of the message based on the comparison.

#### REMARKS

Reconsideration and withdrawal of the rejections presented in the Office Action are respectfully requested in view of the foregoing Amendments and the following Remarks.

In the Office Action of July 08, 1997, Claims 22-26 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter Applicants regard as the invention. Claims 1-5, 7, 9-10, and 14 were rejected under 35 U.S.C. § 102(e) as anticipated by Schwed. Claims 6, 8, 11-13 and 15-26 were rejected under 35 U.S.C. § 103 as unpatentable over Schwed.

Applicants have amended claims 1-7, 10, 11, 13, 15, 16, 17, 18, and 22. Claims 9, 14, 19, 20, and 21 have been canceled. New claims 27-33 have been added. Claims 1-8, 10-13, 15-18, and 22-33 remain for consideration.

Applicants thank the Examiner for the courtesy extended to the undersigned in the interview of January 07, 1998. In the interview Applicants' representatives discussed the subject matter of Claims 1-8, 10-13, 15-18, and 22-33 in view of the prior art of record. Proposed amendments to several of the independent claims were presented, and the Examiner indicated that the amended claims appeared to distinguish over the Schwed reference.

Applicants have amended claim 22 to overcome the Examiner's indefiniteness rejection under 35 U.S.C. § 112. As pointed out in the interview, it



is submitted that the claims now clearly recite the function the “computer implemented” steps perform.

As further pointed out in the interview, the security concerns toward which Applicants’ invention is directed are different from those addressed by Schwed. As illustrated in Figs. 3A, 3B, 3C, and 3D thereof, Schwed discloses a firewall system to prevent unauthorized ingress and egress to a network. The system is implemented by a network administrator. As stated in Applicants’ specification, Applicants’ invention “relates to a system for filtering messages transmitted between the Internet and a client computer.”

As discussed during the interview, the Schwed system and Applicants’ methods operate at different layers of the seven-level ISO communication protocol model, illustrated at Fig. 5 and discussed at Col. 6 l. 36 – col. 7 l. 46 of Schwed. As made clear at Fig. 5 and col. 6 ll. 3-7, the packet filters of Schwed operate between the network interface hardware (level 2) and the network software (level 3). Applicants’ filtering methods, by contrast, operate between the presentation and applications levels (layers 6 and 7, respectively) of the seven-level ISO protocol model. Schwed recognizes that the level at which a security system operates has significant consequences, and specifically *teaches away* from a system operating on the applications level (layer 7) of the ISO communication protocol model, such as Applicants’ filtering methods:

Different communication protocols employ different levels of the ISO model. A protocol in a certain layer may not be aware to protocols employed at other layers. This is an *important factor* when making security actions. For example, an application (Level 7) may not be able to identify the source computer for a communication attempt (Levels 2-3), and therefore, may not be able to provide sufficient security. Schwed patent, col. 6 ll. 57-64 (emphasis added).

These fundamental differences between the Schwed network security system and Applicants’ filtering methods are further illustrated in the operation of the two types of filters in Applicants’ methods. Schwed does not disclose the use of immediate action and deferred action filters as embodied in Applicants’



methods. The deferred action filters in Applicants' methods include additional fields, such as a keyword field, a filter pattern field, a directional indicator field, or a compare directive field, that are neither disclosed nor suggested by Schwed. See specification, p. 8 ll. 17-28. The presence of these filters together with the direct action filters allows the type of highly selective filtering that is characteristic of Applicants' invention.

Applicants have reviewed the Canale *et al.* reference noted by the Examiner during the interview. The Canale *et al.* reference discloses an e-mail system having filtering capability to avoid junk or undesired e-mail. However, Canale *et al.* does not disclose or suggest the methods claimed by Applicants. In particular, the filtering capability disclosed by Canale *et al.*, requires the use of two additional fields in the e-mail message itself, e.g., recipient specifier 121 and referral list 127. Canale *et al.* patent, col. 3 ll. 21-30. Thus, the additional filtering capability will only be obtained if the user specifies values for these additional fields in each e-mail message. Accordingly, Canale *et al.*, do not disclose or suggest the methods claimed by Applicants for at least the reason that there is no table of filters comprising immediate and deferred action filters.

The Internet filtering function to which Applicants' methods are directed do not require the user to specify additional information in the message itself. Instead, the combination of the immediate action filters and the deferred action filters that are maintained in the table of filters provide the filtering function. The user is not required to add additional fields to the message to obtain the filtering function. Accordingly, it is submitted that the invention as claimed is patentably distinct from Canale *et al.*



Serial No. 08/645,636

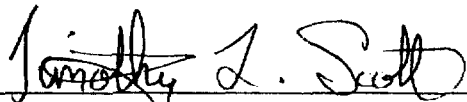
**Conclusion**

In view of the foregoing Amendments and Remarks, Applicants submit that the application is in condition for allowance and an early notice thereof is earnestly solicited. Should any outstanding issues remain, the Examiner is invited to telephone the undersigned at (202) 383-6613.

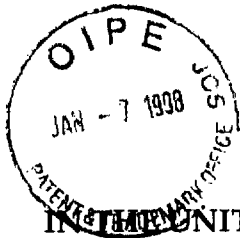
Respectfully submitted,

Dated: January 7, 1997

**HOWREY & SIMON**  
1299 Pennsylvania Avenue, NW  
Washington, D.C. 20004-2402  
Tel: (202) 783-0800  
Fax: (202) 383-6610

  
\_\_\_\_\_  
Timothy L. Scott  
Registration No. 37,931





2784

PATENTS

Docket No. 06650.0002

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of W.S. DUVALL; M. KENDALL :  
Serial No. 08/645,636 : Group Art Unit 2315  
Filed May 15, 1996 : Examiner: V. Vu  
For **INTERNET FILTERING SYSTEM**

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

Enclosed herewith please find:

- ☒ Associate Power of Attorney
- ☒ Amendment
- ☒ Petition for Three Month Extension of Time
- ☒ The filing fee, for a **Small Entity** has been calculated as shown below. Small Entity status has been previously established for this application, and is still appropriate and desired.

	Claims Remaining After Amendment		Highest No. Previously Paid For	Number Extra	Rate	Additional Fee
Total Claims	31	minus	26	5	x \$11.00	\$ 55.00
Indep. Claims	5	minus	4	1	x \$41.00	\$ 41.00
Multiple Dependent Claim(s), if any				0	\$135.00	\$ .00
Subtotal Filing Fee Calculation						\$ .00
ADDITIONAL FEES Petition for Three Month Extension						\$ 475.00
Total Enclosed						\$ 571.00

- ☒ Howrey & Simon Check No. 200760 in the amount of \$571.00 is enclosed.
- ☒ The Commissioner is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account No. 08-3038 -- *This sheet is submitted in triplicate.*
- ☒ Any filing fees under 37 CFR 1.16 for the presentation of extra claims
- ☒ Any patent application processing fees under 37 CFR 1.17.

Respectfully submitted,

*Timothy L. Scott*

Timothy L. Scott  
Registration No. 37,931

Date: January 7, 1998  
**HOWREY & SIMON**  
Box No. 34  
1299 Pennsylvania Avenue, NW  
Washington, D.C. 20004  
Tel: (202) 783-0800





**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.
08/645,636	03/15/96	DUVALL	W 103,728,127

MICHAEL J BEVILACQUA  
HALE AND DORR  
60 STATE STREET  
BOSTON MA 02109

LM21/0406

EXAMINER  
VO, V

ART UNIT PAPER NUMBER  
2784 9

DATE MAILED: 04/06/98

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

**Commissioner of Patents and Trademarks**



## Office Action Summary

Application No.

08/645,636

Applicant(s)

Duvall et al

Examiner

V. V.

Group Art Unit

2784

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

### Period for Response

A SHORTENED STATUTORY PERIOD FOR RESPONSE 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 response be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for response specified above is less than thirty (30) days, a response within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for response is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to respond within the set or extended period for response will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

### Status

- ☒ Responsive to communication(s) filed on 1-7-98.
- ☒ 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 C.D. 11; 453 O.G. 213.

### Disposition of Claims

- ☒ Claim(s) 1-8, 10-13, 15-18, 22-33 is/are pending in the application.
- Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- ☒ Claim(s) 1-8, 10-13, 15-18, 22-33 is/are rejected.
- ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- ☐ Claim(s) \_\_\_\_\_ are subject to restriction or election requirement.

### Application Papers

- ☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- ☐ 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 (a)-(d)

- ☐ Acknowledgment 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: \_\_\_\_\_

### Attachment(s)

- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_
- ☒ Notice of References Cited, PTO-892
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Interview Summary, PTO-413
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Other \_\_\_\_\_

Office Action Summary



Serial No. 08/645,636

**DETAILED ACTION**

1. This office action responds to applicant's amendment filed 1/7/1998. Claims 9, 14 and 19-21 have been canceled. New claims 27-33 have been added.

**Art Rejections:**

2. The text of 35 U.S.C. 103 not cited here can be found in the previous office action.

3. Claims 1-8, 10-13, 15-18 and 22-33 are rejected under 35 U.S.C. § 103 as being unpatentable over Canale et al, hereafter Canale, U.S. pat. No. 5,619,648 in view of Shwed, U.S. pat. no. 5,606,668.

Canale discloses a method of filtering electronic messages (see Canale's abstract). In particular, Canale's method comprises the steps of:

(a) opening a data stream to send a message through an interface (107, fig. 1) to a network server/workstation (see Canale's col 3, lines 13-21),

(b) maintaining a filtering database in the network (i.e., at the server or client workstation) having a plurality of tables (301, 305, fig. 3) containing user's specified deferred actions including



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phrases, keywords, etc., (see Canale's col 4, lines 25-27 and col 7, lines 29-38),

(c) comparing (at the application level) information in the message to filtering information in the tables (see Canale's col 8, lines 19-37),

(d) determining (at the application level) whether to prevent or allow the incoming/outgoing transmission of the message based on the comparison.

Canale does not disclose performing immediate filtering action on the transferred messages. The use of such immediate filtering action for providing security for networked servers/workstations is well-known in the art as is disclosed by Shwed. Particularly, Shwed discloses a filtering system and method of securing inbound/outbound data packet flow in a computer network comprising the steps of:

(I) opening a data stream for sending/receiving data packets through an interface including multiple communication layers (502, fig. 5) (see Shwed's col 7, lines 14-17),

(ii) maintaining a database of immediate action information (figures 3a, 3b) including service names, ports, network addresses, etc., (see Shwed's col 4, line 43 - col 5, line 21),



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(iii) comparing (at the network level) (524, fig. 5) information (e.g., IP address) of the data packet to filtering information in the packet filter and determining (534, fig. 5) whether to block or allow the inbound/outbound transmission of the data packet based on the comparison (see Shwed's col 7, lines 18-46),  
(iv) transferring/downloading the generated filtering information for storage in tables of the corresponding packet filters (see Shwed's col 4, lines 16-33).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize Shwed's message filtering (at the network level) in Canale because it would have provided more secured data communications in the network.

As to claims 5-6, 13 and 28, Shwed does not explicitly teach comparing a domain name, a file/directory or a command in the URL against the (immediate action) filtering information.

An official notice is taken that the use of URL to specify a location of a server or a file on the internet is well-known in the art. It would have been logical/self-evident to one skilled in the art to utilize the URL of the transferred message/command for validating the destination address of a specific server/file on the internet.



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As to claims 22-26, it is noted that in Canale, the mail filtering routine (called routine) which is called by the application program (calling program) comprises two main sub-routines, i.e. first stage routine (head processing routine) and second stage routine (tail processing routine) (see Canale's col 8, lines 47-56). An official notice is also taken that the steps of calling a sub-routine from a program and returning to the calling program after the execution of the called routine is well-known in the art.

**Response to Amendment:**

4. Applicant's arguments filed on 1/7/1998 with respect to claims 1-8, 10-13, 15-18 and 22-33 are moot in view of new grounds of rejection.

Applicant asserts that Canale fails to teach the claimed invention because Canale requires the use of two additional fields in the message itself in order to perform the mail filtering.

This is not found persuasive. It is noted that Canale and Shwed disclose the invention as claimed, i.e., filtering the message by comparing information in the message to filtering information in the database. The fact that Canale discloses



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additional steps, i.e., adding a data field in the message itself, not claimed, is irrelevant.

**Conclusion:**

5. The following references are cited by the examiner but not relied upon are considered pertinent to applicant's disclosure.

A. Boaz et al, U.S. pat. No. 5,333,266: method and apparatus for message handling in computer systems.

6. Applicant's amendment necessitated the new grounds of rejection. Accordingly, **THIS ACTION IS MADE FINAL**. See M.P.E.P. § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 C.F.R. § 1.136(a).

A SHORTENED STATUTORY PERIOD FOR RESPONSE TO THIS FINAL ACTION IS SET TO EXPIRE THREE MONTHS FROM THE DATE OF THIS ACTION. IN THE EVENT A FIRST RESPONSE IS FILED WITHIN TWO MONTHS OF THE MAILING DATE OF THIS FINAL ACTION AND THE ADVISORY ACTION IS NOT MAILED UNTIL AFTER THE END OF THE THREE-MONTH SHORTENED STATUTORY PERIOD, THEN THE SHORTENED STATUTORY PERIOD WILL EXPIRE ON THE DATE THE ADVISORY ACTION IS MAILED, AND ANY EXTENSION FEE PURSUANT TO 37 C.F.R. § 1.136(a) WILL BE CALCULATED FROM THE MAILING DATE OF THE ADVISORY ACTION. IN NO EVENT WILL THE STATUTORY PERIOD FOR RESPONSE EXPIRE LATER THAN SIX MONTHS FROM THE DATE OF THIS FINAL ACTION.



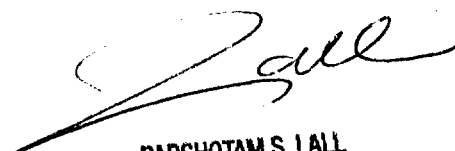
Serial No. 08/645,636

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Viet Vu whose telephone number is (703) 305-9597. The examiner can normally be reached on Monday through Friday from 8:00am to 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parsh Lall, can be reached on (703) 305-9715. The fax phone number for this Group is (703) 308-5356.

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

V. Vu  
Art Unit 2784  
3/25/98



PARSHOTAM S. LALL  
SUPERVISORY PATENT EXAMINER



Notice of References Cited			Application No.		Applicant(s)		
			08/645,636		Duvall et al		
			Examiner		Group Art Unit		
			V. Vu		2784		
					Page 1 of 1		
U.S. PATENT DOCUMENTS							
*		DOCUMENT NO.	DATE	NAME		CLASS	SUBCLASS
	A	5,333,266	7/26/94	Boaz et al		395	200.36
	B						
	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						
	H						
	S						
	T						
NON-PATENT DOCUMENTS							
*		DOCUMENT (Including Author, Title, Source, and Pertinent Pages)					DATE
	U						
	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).)



08/64-5,636



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.
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EXAMINER
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ART UNIT	PAPER NUMBER
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10

DATE MAILED:

INTERVIEW SUMMARY

All participants (applicant, applicant's representative, PTO personnel):

(1) T. Scott (3) \_\_\_\_\_  
(2) V. Vu (4) \_\_\_\_\_

Date of Interview 7-2-98

Type: ☐ Telephonic ☒ Personal (copy is given to ☐ applicant ☒ applicant's representative).

Exhibit shown or demonstration conducted: ☐ Yes ☐ No If yes, brief description: \_\_\_\_\_

Agreement ☐ was reached. ☒ was not reached.

Claim(s) discussed: 1

Identification of prior art discussed: Canale & Shubert

Description of the general nature of what was agreed to if an agreement was reached, or any other comments: discussed differences between the invention and prior art; i.e. implementation and relations between two filtering actions (immediate and deferred).

(A fuller description, if necessary, and a copy of the amendments, if available, which the examiner agreed would render the claims allowable must be attached. Also, where no copy of the amendments which would render the claims allowable is available, a summary thereof must be attached.)

1. ☒ It is not necessary for applicant to provide a separate record of the substance of the interview.

Unless the paragraph above has been checked to indicate to the contrary. A FORMAL WRITTEN RESPONSE TO THE LAST OFFICE ACTION IS NOT WAIVED AND MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a response to the last Office action has already been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW.

2. ☐ Since the Examiner's interview summary above (including any attachments) reflects a complete response to each of the objections, rejections and requirements that may be present in the last Office action, and since the claims are now allowable, this completed form is considered to fulfill the response requirements of the last Office action. Applicant is not relieved from providing a separate record of the interview unless box 1 above is also checked.

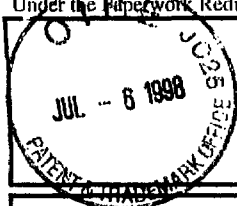
Examiner Note: You must sign this form unless it is an attachment to another form.



Please type a plus sign (+) inside this box → ☐

PTO/SB/29 (2/98)  
Approved for use through 09/03/00. OMB 0651-0032  
Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number



**CONTINUED PROSECUTION APPLICATION (CPA)  
REQUEST TRANSMITTAL**

Submit an original, and a duplicate for fee processing.  
(Only for Continuation or Divisional applications under 37 CFR 1.53(d))

☒ CHECK BOX, if applicable:  
**DUPLICATE**

Address to:

Assistant Commissioner for Patents  
Box CPA  
Washington, DC 20231

Attorney Docket No.	06650.0002
First Named Inventor	Duvall
Examiner Name	V. Vu
Group/Art Unit	2315
Express Mail Label No.	

This is a request for a ☒ continuation or ☐ divisional application under 37 C.F.R. § 1.53(d),  
(continued prosecution application (CPA)) of prior application number 08/645,636, filed on May 15, 1996, entitled Internet Filtering System

**NOTES**

**FILING QUALIFICATIONS:** The prior application identified above must be a nonprovisional application that is either: (1) complete as defined by 37 CFR 1.51(b), or (2) the national stage of an international application in compliance with 35 U.S.C. 371. A Notice will be placed on a patent issuing from a CPA, except for reissues and designs, to the effect that the patent issued on a CPA and is subject to the twenty-year patent term provisions of 35 U.S.C. § 154(a)(2). Therefore, the prior application of a CPA may have been filed before, on, or after June 8, 1995.

**C-I-P NOT PERMITTED:** A continuation-in-part application cannot be filed as a CPA under 37 CFR 1.53(d), but must be filed under 37 CFR 1.53(b).

**EXPRESS ABANDONMENT OF PRIOR APPLICATION:** The filing of this CPA is a request to expressly abandon the prior application as of the filing date of the request for a CPA. 37 CFR 1.53(b) must be used to file a continuation, divisional, or continuation-in-part of an application that is not to be abandoned.

**ACCESS TO PRIOR APPLICATION:** The filing of this CPA will be construed to include a waiver of confidentiality by the applicant under 35 U.S.C. 122 to the extent that any member of the public who is entitled under the provisions of 37 CFR 1.14 to access to, copies of, or information concerning, the prior application may be given similar access to, copies of, or similar information concerning, the other application or applications in the file jacket.

**35 U.S.C. 120 STATEMENT:** In a CPA, no reference to the prior application is needed in the first sentence of the specification and none should be submitted. If a sentence referencing the prior application is submitted, it will not be entered. A request for a CPA is the specific reference required by 35 U.S.C. 120 and to every application assigned the application number identified in such request, 37 CFR 1.78(a).

- ☐ Enter the unentered amendment previously filed on \_\_\_\_\_ under 37 CFR 1.116 in the prior nonprovisional application.
- ☒ A preliminary amendment is enclosed.
- This application is filed by fewer than all the inventors named in the prior application, 37 CFR 1.53 (d)(4).  
☐ DELETE the following inventor(s) named in the prior nonprovisional application:  
01 FC:231 395.00 DP  
02 FC:202 121.00 DP  
03 FC:203 121.00 DP  
☐ The inventor(s) to be deleted are set forth on a separate sheet attached hereto.
- ☐ A new power of attorney or authorization of agent (PTO/SB/81) is enclosed.
- Information Disclosure Statement (IDS) is enclosed:
  - ☐ PTO-1449
  - ☐ Copies of IDS Citations

[Page 1 of 2]

Burden Hour Statement: This form is estimated to take 0.4 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, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Box CPA, Washington, DC 20231.



Please type a plus sign (+) inside this box → ☐

PTO/SB/29 (2/98)  
Approved for use through 09/03/00. OMB 0651-0032  
Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

CLAIMS	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS
	TOTAL CLAIMS (37 CFR 1.16(c))	31 - 20* =	11	x \$ 22 =	\$ 242.00
	INDEPENDENT CLAIMS (37 CFR 1.16(b))	5 - 3** =	2	x \$ 82 =	\$ 164.00
	MULTIPLE DEPENDENT CLAIMS (if applicable) (37 CFR 1.16(d))			+ \$ _____ =	\$
				BASIC FEE (37 CFR 1.16(a))	\$ 790.00
				Total of above Calculations =	\$1196.00
				Reduction by 50% for filing by small entity (Note 37 CFR 1.9, 1.27, 1.28)	- 598.00
				TOTAL =	598.00

\* Reissue claims in excess of 20 over original patent  
\*\* Reissue independent claims over original patent

5. Small entity status:

a. ☐ A small entity statement is enclosed, if (b) and (c) do not apply.

b. ☒ A small entity statement was filed in the prior nonprovisional application and such status is still proper and desired.

c. ☐ Is no longer claimed.

7. The Commissioner is hereby authorized to credit overpayments or charge the following fees to Deposit Account No. 08-3038:

a. ☒ Fees required under 37 CFR 1.16.

b. ☒ Fees required under 37 CFR 1.17.

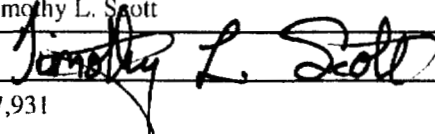
c. ☐ Fees required under 37 CFR 1.18.

8. ☒ A check in the amount of \$598.00 is enclosed.

9. ☐ Other:

**NOTE:** The prior application's correspondence address will carry over to this CPA UNLESS a new correspondence address is provided below.

10. NEW CORRESPONDENCE ADDRESS					
<input type="checkbox"/> Customer Number or Bar Code Label		or <input checked="" type="checkbox"/> New Correspondence address below			
(Insert Customer No. or Attach bar code label here)					
NAME	HOWREY & SIMON				
ADDRESS	Box No. 34				
	1299 Pennsylvania Avenue, N.W.				
CITY	Washington	STATE	DC	ZIP CODE	20004-2402

11. SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED	
Name	Timothy L. Scott
Signature	
Registration No. (Attorney/Agent)	37,931
Date	July 6, 1998





#12/B  
**PATENT**  
Docket No. 6650/0002  
Turned  
7/13/98

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Inventor(s): W.S. Duvall; M. Kendall

Serial No.: 08/645,636

Group Art Unit: 2315

Filing Date: 15 May 1996

Examiner: V. Vu

For: Internet Filtering System

Assistant Commissioner for Patents  
Washington D.C. 20231

**Box CPA**

**Preliminary Amendment**

S I R:

This Preliminary Amendment is filed concurrently with Continued Prosecution Application (CPA) Request Transmittal Form PTO/SB/29 to continue prosecution of application serial number 08/645,636. The Preliminary Amendment is in response to the Office Action mailed April 06, 1998.

Please amend the above-identified patent application as follows.

In the Claims:

Please amend claims 1, 5, 7, 10, 13, 15, 16, 17, and 18 as follows:

98 JUL - 9 PM 3:26  
RECEIVED



1. (Twice Amended) A method for communicating with servers over the Internet to prevent or allow access to Internet sites, the method comprising computer-implemented steps of:

- (a) opening a data stream to send a message through an interface to an Internet server;
- (b) maintaining a database of filtering information comprising a table of filters, said table comprising
  - (1) filters specifying immediate action, and
  - (2) filters specifying deferred action;
- (c) comparing information in the message to filtering information in at least one of said filters specifying immediate action and said filters specifying deferred action [the database]; and
- (d) determining whether to prevent or allow the outgoing transmission of the message based on the comparison.

6. (Twice Amended) The method of claim [23] <sup>5</sup>~~27~~, wherein the message includes a URL, and step (c) includes comparing a domain name in the URL to [the] filtering information in at least one of said filters specifying immediate action and said filters specifying deferred action.

7. (Twice Amended) The method of claim [23] <sup>5</sup>~~27~~, wherein step (c) includes comparing a command after a connection has been opened to [the] filtering information in at least one of said filters specifying immediate action and said filters specifying deferred action.

10. (Twice Amended) The method of claim [23] <sup>5</sup>~~27~~, wherein step (c) includes comparing strings in the message against strings in at least one of said filters specifying immediate action and said filters specifying deferred action [filter entries in the filter database], the strings in the filter database being maintained based on the least common string in the filter entry.

13. (Twice Amended) The method of claim [23] <sup>5</sup>~~27~~, wherein the message includes a URL, wherein step (c) includes comparing a command in the URL to at least one of said filters specifying immediate action and said filters specifying deferred action [the filtering information].

15. (Twice Amended) A method for filtering messages transmitted over the Internet to prevent or allow access to Internet sites, the method comprising computer-implemented steps of:

- (a) maintaining a database of filtering information comprising a table of filters, said table comprising
  - (1) filters specifying immediate action, and



- 6 (2) filters specifying deferred action;
- 7 (b) comparing information in the [Internet] message to filtering information in at
- 8 least one of said filters specifying immediate action and said filters specifying deferred
- 9 action [the database]; and
- 10 (c) determining whether to prevent or allow transmission of the message in response
- 11 to the comparison.

1 <sup>17</sup>~~16~~. (Twice Amended) The method of claim [25] <sup>16</sup>~~29~~, wherein step (d) includes replacing

2 the existing filter information with the new filter information.

1 <sup>18</sup>~~17~~. (Twice Amended) The method of claim [25] <sup>16</sup>~~29~~, wherein the update server has a

2 number of sets of new filter information, the method further including a step of providing to the

3 server a message indicating which set of filters to download.

1 <sup>19</sup>~~18~~. (Twice Amended) A method for communicating with servers over the Internet to

2 prevent or allow access to Internet sites, the method comprising the computer implemented steps

3 of:

- 4 (a) sending messages to and receiving messages from an Internet server through an
- 5 interface;
- 6 (b) maintaining a database of filtering information comprising a table of filters, said
- 7 table comprising
- 8 (1) filters specifying immediate action, and
- 9 (2) filters specifying deferred action;
- 10 (c) comparing information in the messages to filtering information in at least one of
- 11 said filters specifying immediate action and said filters specifying deferred action [the
- 12 database]; and
- 13 (d) determining whether to prevent or allow transmission of the messages based on
- 14 the comparison;
- 15 wherein steps (a) – (d) are performed by a client computer connected to the Internet through a
- 16 network server.



23  
33

(Amended) A method for communicating with servers over the Internet to prevent or allow access to Internet sites, the method comprising the computer-implemented steps of:

- B  
7
- (a) opening a data stream to receive a message through an interface from an Internet server;
  - (b) maintaining a database of filtering information comprising a table of filters, said table comprising
  - (c) filters specifying immediate action, and
  - (d) filters specifying deferred action;
  - (e) comparing information in the message to filtering information in the filters specifying immediate action and filters specifying deferred action [database] and
  - (f) determining whether to prevent or allow the incoming transmission of the message based on the comparison.

#### REMARKS

This Preliminary Amendment, filed concurrently with Continued Prosecution Application (CPA) Request Transmittal Form PTO/SB/29, is in response to the Office Action mailed April 06, 1998. Reconsideration and withdrawal of the rejections presented in the Office Action are respectfully requested in view of the foregoing amendments and the following remarks.

In the Office Action of April 06, 1998, pending claims 1-8, 10-13, 15-18, and 22-33 were rejected under 35 U.S.C. § 103 as being unpatentable over Canale et al., U.S. 5,619,648, in view of Schwed, U.S. 5,606,668.

Applicants have amended claims 1, 5, 7, 10, 13, 15, 16, 17, 18, and 33. Claims 1-8, 10-13, 15-18, and 22-33 remain for consideration.

Applicants thank the Examiner for the courtesy extended to the undersigned in the interview of July 02, 1998. In the interview, applicants' representative discussed the subject matter of the pending claims in view of Canale et al. and Schwed. Differences between Canale et al. and Schwed were presented, and the possibility of amending the claims to more particularly point out the noted differences was discussed.

Applicants have amended claims 1, 15, 18, and 33 to more particularly point out the differences between the claimed invention and the prior art of record. As pointed out in the interview, applicants' invention is directed toward methods of preventing access to undesired sites on the Internet and allowing access to desired sites. Canale et al. discloses an email filtering system for locating expertise. As the Examiner pointed out in the Office Action, "Canale [et al.] does not disclose



performing immediate filtering action on the transferred messages.” Office Action of April 06 at 3 lines 9-10.

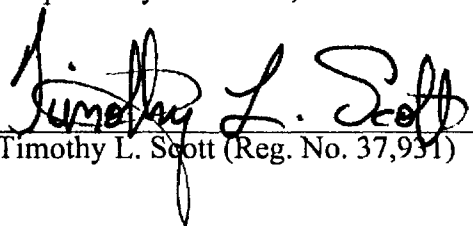
Canale et al. contains no disclosure, teaching or suggestion of combining immediate action filters with deferred action filters. Furthermore, Canale et al. contains no disclosure, teaching or suggestion that allowing access to desired Internet sites while also preventing access to undesired Internet sites is possible.

Additionally, because Schwed et al. operates at different layers of the seven-level ISO communication protocol model from applicants’ inventions, there is no motive to combine the teachings of Schwed with those of Canale et al. More fundamentally, neither Schwed nor Canale et al. provides a suggestion to combine immediate action filters with deferred action filters, nor is there any teaching that making that combination in the manner claimed can be used to both allow access to desired Internet sites and prevent access to undesired Internet sites.

#### Conclusion

In view of the foregoing amendments and remarks, Applicants submit that the application is in condition for allowance and an early notice thereof is earnestly solicited. Should any outstanding issues remain, the Examiner is invited to telephone the undersigned at (202) 383-6613.

Respectfully submitted,

  
Timothy L. Scott (Reg. No. 37,931)

Dated: July 06, 1998

HOWREY & SIMON  
1299 Pennsylvania Avenue, N.W.  
Washington, D.C. 20004-2402  
(202) 783-0800 (telephone)  
(202) 383-6610 (telecopier)



**HOWREY & SIMON**

July 6, 1998

Attorneys at Law  
1299 Pennsylvania Ave., NW  
Washington, DC 20004-2402  
(202) 783-0800  
FAX (202) 383-6610

**Box CPA**



Assistant Commissioner for Patents  
Washington, D.C. 20231

Re: Continued Prosecution Application Under 37 C.F.R. § 1.53(d)  
Appl. No. **08/645,636** Filed: **May 15, 1996**  
For: Internet Filtering System  
Inventors: William S. Duvall and Matthew Kendall.  
Our Ref: 06650.0002

Sir:

The following documents are forwarded herewith for appropriate action by the U.S.  
Patent and Trademark Office:

1. Continued Prosecution Application (CPA) Request Transmittal Form PTO/SB/29;
2. Preliminary Amendment;
3. Return postcard; and
4. Our Check No. 161800 for \$ 598.00 to cover:  
    \$ 203.00 Filing fee for patent application;  
    \$ 395.00 Fee for excess claims.

It is respectfully requested that the attached postcard be stamped with the filing date of these documents and returned to our courier.



**HOWREY & SIMON**

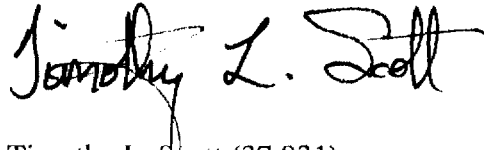
Assistant Commissioner for Patents

July 6, 1998

Page 2

The U.S. Patent and Trademark Office is hereby authorized to charge any fee deficiency, or credit any overpayment, including, but not limited to, any fees required for extensions of time to ensure copendency of parent Application No. 08/645,636 to our Deposit Account No. 08-3038. A duplicate copy of this letter is enclosed.

Respectfully submitted,

A handwritten signature in black ink, reading "Timothy L. Scott". The signature is written in a cursive, flowing style with a large initial 'T' and 'S'.

Timothy L. Scott (37,931)

Enclosures





**UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office**

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

55

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/645,636	05/15/96	DUVALL W	103.728.127

MICHAEL J BEVILACQUA  
HALE AND DORR  
60 STATE STREET  
BOSTON MA 02109

LM02/0806

EXAMINER  
VU, V

ART UNIT	PAPER NUMBER
2758	

DATE MAILED: 08/06/98

13

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

**Commissioner of Patents and Trademarks**



## Office Action Summary

Application No.  
08/645,636Applicant(s)  
Duvall et alExaminer  
V. VuGroup Art Unit  
2758

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

### Period for Response

A SHORTENED STATUTORY PERIOD FOR RESPONSE 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 response be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for response specified above is less than thirty (30) days, a response within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for response is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to respond within the set or extended period for response will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

### Status

- ☒ Responsive to communication(s) filed on 7-6-98
- ☐ 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 C.D. 11; 453 O.G. 213.

### Disposition of Claims

- ☒ Claim(s) 1-8, 10-13, 15-18, 22-33 is/are pending in the application.
- Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- ☒ Claim(s) 1-8, 10-13, 15-18, 27-33 is/are allowed.
- ☒ Claim(s) 22-24, 26 is/are rejected.
- ☒ Claim(s) 25 is/are objected to.
- ☐ Claim(s) \_\_\_\_\_ are subject to restriction or election requirement.

### Application Papers

- ☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- ☐ 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 (a)-(d)

- ☐ Acknowledgment 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 1.7.2(a)).

\*Certified copies not received: \_\_\_\_\_

### Attachment(s)

- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_ ☐ Interview Summary, PTO-413
- ☒ Notice of References Cited, PTO-892 ☐ Notice of Informal Patent Application, PTO-152
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948 ☐ Other \_\_\_\_\_

Office Action Summary



Serial No. 08/645,636

**DETAILED ACTION**

1. This office action responds to applicant's preliminary amendment filed 7/6/1998. Claims 1-8, 10-13, 15-18 and 22-33 are pending.

**Art Rejections:**

2. The text of 35 U.S.C. 103 not cited here can be found in the previous office action.

3. Claim 22 is rejected under 35 U.S.C. § 103 as being unpatentable over Lillich et al, hereafter Lillich, U.S. pat. No. 5,619,698.

Lillich discloses a prior art method of patching operating systems stored in a ROM comprising the steps of:

- (a) providing an application calling a called system routine,
- (b) jumping from the called routine to a patch (head) processing routine,
- (c ) returning to the called routine,
- (d) executing instructions in the called routine,
- (e) returning to a patch (tail) processing routine,
- (f) performing the tail processing routine,



Serial No. 08/645,636

(g) returning to the calling application (see col 3, lines 26-50 and fig. 2).

Lillich teaches that the patch routine contains both pre-processing (head) routine and post-processing (tail) routine (see col 1, lines 31-33).

Lillich does not teach copying instructions from an entry point of a called routine (in the ROM) to a buffer (RAM). An official notice is taken that a method of copying, i.e., shadowing, one or more routines stored in the ROM to a system memory (RAM) for allowing faster instructions/data access is well-known in the art.

It would have been obvious to one of ordinary skill in the art to utilize the "shadowing" method in Lillich because it would have allowed accessing the system routines more quickly.

4. Claims 23-24 and 26 are rejected under 35 U.S.C. § 103 as being unpatentable over Lillich and further in view of Canale et al, hereafter Canale, U.S. pat. No. 5,619,648.

Lillich's teachings, as discussed in item 3 above, are still applied. Lillich does not specifically teach filtering electronic mails (e-mails) transmitted over the Internet. Canale discloses a method of filtering e-mails comprises the steps of:



Serial No. 08/645,636

(i) maintaining a filtering database having a plurality of tables (301, 305, fig. 3) (see Canale's col 4, lines 25-27 and col 7, lines 29-38),

(ii) comparing information in the message to filtering information in the tables (see Canale's col 8, lines 19-37).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the method of patching software (as described in Lillich) in Canale's computer system because it would have allowed Canale's operating system routines to be modified without affecting the operations of applications (which utilize the system routines) (see Lillich's col 2, lines 20-23).

**Allowable Subject Matter:**

5. Claims 1-8, 10-13, 15-18 and 27-33 are allowed over prior art of record.

6. Claim 25 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.



Serial No. 08/645,636

**Conclusion:**

5. The following references are cited by the examiner but not relied upon are considered pertinent to applicant's disclosure.

A. Bealkowski et al, U.S. pat. No. 5,446,898: method and apparatus for configuring and installing a loadable BIOS device support layer in a computer system.

B. Schwagmann, U.S. pat. No. 5,321,844: method for error correction of software errors in a communication system.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Viet Vu whose telephone number is (703) 305-9597. The examiner can normally be reached on Monday through Friday from 8:00am to 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parsh Lall, can be reached on (703) 305-9715. The fax phone number for this Group is (703) 308-5356.

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



V. Vu  
Art Unit 2758

7/28/98



Notice of References Cited			Application No. 08/645,636	Applicant(s) Duvall et al	
			Examiner V. Vu	Group Art Unit 2758	Page 1 of 1
U.S. PATENT DOCUMENTS					
*		DOCUMENT NO.	DATE	NAME	CLASS SUBCLASS
	A	5,619,698	4-8-97	Lillich et al	395 710
	B	5,446,898	8-29-95	Bealkowski et al	395 651
	C	5,321,844	6-14-94	Schwagmann	395 182.07
	D				
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FOREIGN PATENT DOCUMENTS					
*		DOCUMENT NO.	DATE	COUNTRY	NAME CLASS SUBCLASS
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	O				
	P				
	Q				
	R				
	S				
	T				
NON-PATENT DOCUMENTS					
*		DOCUMENT (Including Author, Title, Source, and Pertinent Pages)			DATE
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	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).)



**PATENT**  
Docket No. 6650/0002

#14/C

RECEIVED  
SEP - 2 98  
GROUP 2700  
Turner 9/8/98

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Inventor(s): W.S. Duvall; M. Kendall

Serial No.: 08/645,636

Filing Date: 15 May 1996

For: Internet Filtering System

Group Art Unit: 2758

Examiner: V. Vu

Assistant Commissioner for Patents  
Washington D.C. 20231

*Box Patent Application*

**Amendment**

S I R:

This Amendment is in response to the Office Action mailed August 06, 1998.

Please amend the above-identified patent application as follows.

In the Claims:

Please cancel claims 22-26, without prejudice.

Please add new claim 34 as follows:

24 ~~34~~. A method of executing a hard patch for a called computer routine comprising the computer-implemented steps of:

- (a) identifying instructions and copying a number of instructions with a minimum number of bytes from an entry point of a called routine to a buffer;
- (b) providing an application calling the called routine;
- (c) jumping from the called routine to a head processing routine;
- (d) performing the head processing routine;
- (e) jumping to the buffer;
- (f) executing the copied instructions;
- (g) returning to the called routine after the jump of step (c);
- (h) returning to a tail processing routine;
- (i) performing the tail processing routine; and
- (j) returning to the calling application.



**REMARKS**

This Amendment is in response to the Office Action mailed August 06, 1998. Filed concurrently herewith is a Revocation of Prior Power of Attorney and Appointment of New Attorneys of Record, a Certificate Under 37 C.F.R. § 3.73(b), and a Notice of Correspondence Request to change the correspondence address to the undersigned attorney. In view of the cancellation of the rejected claims, and the rewritten claim to which the Examiner has objected, Applicants submit that the application is in a position for allowance and respectfully request early notice to that effect.

In the Office Action of August 06, 1998, the examiner indicated that claims 1-8, 10-13, 15-18, and 27-33 are allowed. In addition, the Examiner rejected claims 22-24 and 26. Claim 25 was objected to as being dependent upon a rejected base claim, but was indicated to be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicants have canceled claims 22-26. Claim 25 has been rewritten in independent form as Claim 34, incorporating all of the limitations of the base claim from which it depends. Accordingly, allowed claims 1-8, 10-13, 15-18, 27-33, as well as new Claim 34, remain for consideration. All of the remaining claims have been either expressly allowed or indicated to be allowable as rewritten.

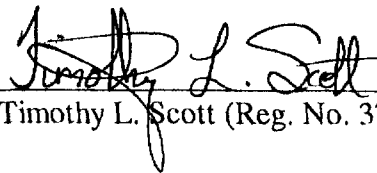


- 3 -

**Conclusion**

In view of the foregoing amendments and remarks, Applicants submit that the application is in condition for allowance and an early notice thereof is earnestly solicited. Should any outstanding issues remain, the Examiner is invited to telephone the undersigned at (202) 383-6613.

Respectfully submitted,

  
\_\_\_\_\_  
Timothy L. Scott (Reg. No. 37,931)

Dated: September 01, 1998

HOWREY & SIMON  
1299 Pennsylvania Avenue, N.W.  
Washington, D.C. 20004-2402  
(202) 783-0800 (telephone)  
(202) 383-6610 (telecopier)



#15

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

RECEIVED  
SEP - 2 58  
GROUP 2100

In re application of:

William S. Duvall *et al.*

Appl. No. 08/645,636

Filed: May 15, 1996

For: **Internet Filtering System**

Art Unit: 2758

Examiner: V. Vu

Atty. Docket: 06650.0002 (New)

W 103.728.127 (Old)

**Notice Of Correspondence Address**

Assistant Commissioner for Patents  
Washington, D.C. 20231


Sir:

Please change the correspondence address for the above-referenced application to be as follows:

Timothy L. Scott, Esq.  
HOWREY & SIMON  
Box No. 34  
1299 Pennsylvania Avenue, N.W.  
Washington, DC 20004-2402

Please change the attorney docket number to the new attorney docket number (06650.0002) as shown above. Please direct telephone calls to 202-383-6613.

Respectfully submitted,



Timothy L. Scott (Reg. No. 37,931)

Date: September 01, 1998

HOWREY & SIMON  
Box No. 34  
1299 Pennsylvania Avenue, N.W.  
Washington, DC 20004-2402  
(202) 783-0800



16  
a/c  
9/10

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

William S. Duvall *et al.*

Appl. No. 08/645,636

Filed: May 15, 1996

For: Internet Filtering System

Art Unit: 2758

Examiner: V. Vu

Atty. Docket: 06650.0002 (New)  
W 103.728.127 (Old)

RECEIVED  
SEP - 2 50  
GROUP 2780

**Revocation of Prior Power of Attorney and Appointment of New Attorneys  
of Record**

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

The above-captioned application is a Continuing Patent Application. Spyglass, Inc. is the assignee of the entire right, title and interest in the above-captioned application by virtue of the assignment by William S. Duvall and Matthew Kendall, a copy of which is attached hereto. The undersigned, having express authority to represent Spyglass, Inc., hereby revokes all powers of attorney heretofore given in the above-captioned application and appoints as his attorneys Jeffrey I. Auerbach, Reg. No. 32,680; Melvin L. Barnes, Jr., Reg. No. 38,375; Michael J. Bell, Reg. No. 39,604; Mark R. Buscher, Reg. No. 35,006; Celine T. Callahan, Reg. No. 34,301; Cono A. Carrano, Reg. No. 39,623; James F. Davis, Reg. No. 21,072; Thomas M. Dunham, Reg. No. 39,965; Joel M. Freed, Reg. No. 25,101; Alan M. Grimaldi, Reg. No. 26,599; Alexander J. Hadjis, Reg. No. 36,540; Albert P. Halluin, Reg. No. 25,227; Michael N. Haynes, Reg. No. 40,014; Richard H. Kjeldgaard, Reg. No. 30,186; Joseph P. Lavelle, Reg. No. 31,036; David R. Marsh, Reg. No. 41,408; Kevin W. McCabe, Reg. No. 41,182; Joseph A. Micallef, Reg. No. 39,772; Anthony D. Miller, Reg. No. 34,394;



- 2 -

Applicants: William S. Duvall *et al.*  
Appl. No.: 08/645,636

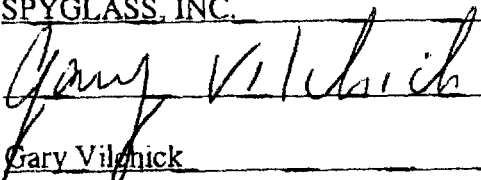
Karen L. Nicastro, Reg. No. 35,968; Russell O. Paige, Reg. No. P40,758; Stephen J. Pentlicki, Reg. No. 40,125; Andrea G. Reister, Reg. No. 36,253; Stephen J. Rosenman, Reg. No. 29,209; David P. Ruschke, Reg. No. 40,151; Timothy L. Scott, Reg. No. 37,931; Anthony W. Shaw, Reg. No. 30,104; Serge Sira, Reg. No. 39,445; J. David Smith, Reg. No. 39,839; and Michael J. Songer, Reg. No. 39,841, with full power of substitution, association, and revocation, to prosecute said application and to transact all business in the United States Patent and Trademark Office connected therewith.

The undersigned hereby grants said attorneys the power to insert on this Power of Attorney any further identification that may be necessary or desirable in order to comply with the rules of the U.S. Patent and Trademark Office.

HOWREY & SIMON  
Box No. 34  
1299 Pennsylvania Avenue, N.W.  
Washington, DC 20004-2402

Direct Phone Calls to Timothy L. Scott, Esq. at (202) 383-6613.

On behalf of Spyglass, Inc.:

FOR: SPYGLASS, INC.  
SIGNATURE:   
BY: Gary Vilchick  
TITLE: Executive Vice-President and Chief Financial Officer  
DATE: August 31, 1998



**Certificate Under 37 C.F.R. § 3.73(b)**

Applicant(s): William S. Duvall and Matthew Kendall

Application No: 08/645,636

Filed: May 15, 1996

For: Internet Filtering System

Spyglass, Inc., a corporation,  
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states 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 thereof 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 thereof is attached.

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

☐ Copies of assignments or other documents in the chain of title are attached.

To the best of the undersigned's knowledge and belief, title of the patent application identified above is in the assignee identified above.

The undersigned (whose title is supplied below) is empowered to act 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.

Date: August 31, 1998

Name: Gary Vilchick

Title: Executive Vice-President and Chief Financial Officer

Signature: Gary Vilchick



## **ASSIGNMENT**

WHEREAS, we, **William S. Duvall** and **Matthew Kendall**, being citizens of the United States, residing at **140 Campo Drive, Portola Valley, California 94020**, and **619 Webster Street, Palo Alto, California 94301**, respectively, have made new and useful improvements in **Internet Filtering System**, for which an application for Letters Patent of the United States was filed on **May 15, 1996** as Application Serial No. 08/645,636.

WHEREAS, **Spyglass, Inc.**, a Delaware corporation, having a place of business at 1240 East Diehl road, Naperville, Illinois 60563, and who, together with its successors and assigns ("Assignee") is desirous of acquiring the title, rights, benefits, and privileges hereinafter recited.

NOW, THEREFORE, for valuable consideration furnished by Assignee to us, receipt and sufficiency of which we hereby acknowledge, we hereby, without reservations:

1. Assign, transfer, and convey to Assignee the entire right, title, and interest in and to said application for Letters Patent of the United States, the inventions and discoveries described therein, any and all other applications for Letters Patent on said inventions and discoveries in whatsoever countries, including all divisional, renewal, substitute, continuation, and Convention applications based in whole or in part upon said inventions or discoveries, or upon said applications, and any and all Letters Patent, reissues, and extensions of Letters Patent granted for said inventions and discoveries or upon said applications, and every priority right that is or may be predicated upon or arise from said inventions, said discoveries, said applications, and said Letters Patent.

2. Authorize Assignee to file patent applications in any or all countries for any or all of said inventions and discoveries in our name or in the name of Assignee or otherwise as Assignee may deem advisable, under the International Convention or otherwise.



3. Authorize and request the Commissioner of Patents and Trademarks of the United States of America and the empowered officials of all other governments to issue or transfer all said Letters Patent to Assignee, as assignee of the entire right, title, and interest therein or otherwise as Assignee may direct.

4. Warrant that we have not knowingly conveyed to others any right in said inventions, discoveries, applications, or patents or any license to use the same or to make, use, or sell anything embodying or utilizing any of said inventions or discoveries; and that we have good right to assign the same to Assignee without encumbrance.

5. Bind our heirs, legal representatives, and assigns, as well as ourselves, to do, upon Assignee's request and at Assignee's expense, but without additional consideration to us or them, all acts reasonably serving to assure that the said inventions and discoveries, the said patent applications, and the said Letters Patent shall be held and enjoyed by Assignee as fully and entirely as the same could have been held and enjoyed by us, our heirs, legal representatives, and assigns if this assignment had not been made; and particularly to execute and deliver to Assignee all lawful application documents including petitions, specifications, and oaths, and all assignments, disclaimers, and lawful affidavits in form and substance as may be requested by Assignee; to communicate to Assignee all facts known to us relating to said inventions and discoveries or the history thereof; to furnish Assignee with any and all documents, photographs, models, samples, and other physical exhibits in our control or in the control of our heirs, legal representatives, or assigns which may be useful for establishing the facts of our conception, disclosures, and reduction to practice of said inventions and discoveries; and to testify as to the same in any interference or other litigation.



IN TESTIMONY WHEREOF, I have hereunto set my hand this 11 day of December, 1997.

**Matthew Kendall**



## ASSIGNMENT

WHEREAS, we, **William S. Duvall** and **Matthew Kendall**, being citizens of the United States, residing at <sup>102 KEYSTONE, SUN VALLEY, ID 83353</sup> ~~140 Campo Drive, Portola Valley, California 94020~~, and **619 Webster Street, Palo Alto, California 94301**, respectively, have made new and useful improvements in **Internet Filtering System**, for which an application for Letters Patent of the United States was filed on **May 15, 1996** as Application Serial No. 08/645,636.

WHEREAS, **Spyglass, Inc.**, a Delaware corporation, having a place of business at 1240 East Diehl road, Naperville, Illinois 60563, and who, together with its successors and assigns ("Assignee") is desirous of acquiring the title, rights, benefits, and privileges hereinafter recited.

NOW, THEREFORE, for valuable consideration furnished by Assignee to us, receipt and sufficiency of which we hereby acknowledge, we hereby, without reservations:

1. Assign, transfer, and convey to Assignee the entire right, title, and interest in and to said application for Letters Patent of the United States, the inventions and discoveries described therein, any and all other applications for Letters Patent on said inventions and discoveries in whatsoever countries, including all divisional, renewal, substitute, continuation, and Convention applications based in whole or in part upon said inventions or discoveries, or upon said applications, and any and all Letters Patent, reissues, and extensions of Letters Patent granted for said inventions and discoveries or upon said applications, and every priority right that is or may be predicated upon or arise from said inventions, said discoveries, said applications, and said Letters Patent.

2. Authorize Assignee to file patent applications in any or all countries for any or all of said inventions and discoveries in our name or in the name of Assignee or otherwise as Assignee may deem advisable, under the International Convention or otherwise.



3. Authorize and request the Commissioner of Patents and Trademarks of the United States of America and the empowered officials of all other governments to issue or transfer all said Letters Patent to Assignee, as assignee of the entire right, title, and interest therein or otherwise as Assignee may direct.

4. Warrant that we have not knowingly conveyed to others any right in said inventions, discoveries, applications, or patents or any license to use the same or to make, use, or sell anything embodying or utilizing any of said inventions or discoveries; and that we have good right to assign the same to Assignee without encumbrance.

5. Bind our heirs, legal representatives, and assigns, as well as ourselves, to do, upon Assignee's request and at Assignee's expense, but without additional consideration to us or them, all acts reasonably serving to assure that the said inventions and discoveries, the said patent applications, and the said Letters Patent shall be held and enjoyed by Assignee as fully and entirely as the same could have been held and enjoyed by us, our heirs, legal representatives, and assigns if this assignment had not been made; and particularly to execute and deliver to Assignee all lawful application documents including petitions, specifications, and oaths, and all assignments, disclaimers, and lawful affidavits in form and substance as may be requested by Assignee; to communicate to Assignee all facts known to us relating to said inventions and discoveries or the history thereof; to furnish Assignee with any and all documents, photographs, models, samples, and other physical exhibits in our control or in the control of our heirs, legal representatives, or assigns which may be useful for establishing the facts of our conception, disclosures, and reduction to practice of said inventions and discoveries; and to testify as to the same in any interference or other litigation.



IN TESTIMONY WHEREOF, I have hereunto set my hand this 20<sup>th</sup> day of  
January, ~~1997~~ <sup>1998</sup>.\*



William S. Duvall

\* Date added by Howrey & Simon after consultation.



IN TESTIMONY WHEREOF, I have hereunto set my hand this \_\_\_\_\_ day of  
\_\_\_\_\_, 1997.

\_\_\_\_\_  
**Matthew Kendall**





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.
---------------	-------------	-----------------------	---------------------

08/645636 05/15/96 DUVALL

103-728-127 EXAMINER
-------------------------

MICHAEL J BEVILACQUA  
HALE AND DORR  
60 STATE STREET  
BOSTON MA 02109

ART UNIT 00, VIET	PAPER NUMBER 17
----------------------	--------------------

DATE MAILED:  
2/7/98

09/17/98

This is in response to the Power of Attorney filed \_\_\_\_\_

- ☐ 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 Cheevers*

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.

HOWREY & SIMON  
BOX NO. 34  
1299 PENNSYLVANIA AVE., NW  
WASHINGTON DC 20004-2402

*April Cheevers*  
This is a communication from the  
Patent and Trademark Office

Apple 1007.0108



08/645,636


**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.
--------------------	-------------	-----------------------	---------------------

08/645,636    05/15/96    DUVALL    W    103.728.127

EXAMINER

LM21/0929

 HOWREY & SIMON  
BOX NO. 34  
1299 PENNSYLVANIA AVE., NW  
WASHINGTON DC 20004-2402

 VU, V  
ART UNIT    PAPER NUMBER

2758

18/D

DATE MAILED:

09/29/98

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

**NOTICE OF ALLOWABILITY**

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 communication is responsive to Amendment "C" filed 9-2-98
☒ The allowed claim(s) is/are 1-8, 10-13, 15-18, 27-34
☐ The drawings filed on \_\_\_\_\_ are acceptable.

☐ 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).

 A SHORTENED STATUTORY PERIOD FOR RESPONSE to comply with the requirements noted below is set to EXPIRE **THREE MONTHS** FROM THE "DATE MAILED" of this Office action. Failure to timely comply will result in ABANDONMENT of this application. Extensions of time may be obtained under the provisions of 37 CFR 1.138(a).

☐ Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL APPLICATION, PTO-152, which discloses that the oath or declaration is deficient. A SUBSTITUTE OATH OR DECLARATION IS REQUIRED.

☒ Applicant MUST submit NEW FORMAL DRAWINGS

☐ because the originally filed drawings were declared by applicant to be Informal.

☒ including changes required by the Notice of Draftperson's Patent Drawing Review, PTO-948, attached hereto or to Paper No. 4
☐ including changes required by the proposed drawing correction filed on \_\_\_\_\_, which has been approved by the examiner.

☐ including changes required by the attached Examiner's Amendment/Comment.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the reverse side of the drawings. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftperson.

☐ Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Any response 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)**
☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s) \_\_\_\_\_

☐ Notice of Draftperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

☐ Interview Summary, PTO-413

☒ Examiner's Amendment/Comment

☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

☐ Examiner's Statement of Reasons for Allowance

Apple 1007.0109



**Examiner's Amendment:**

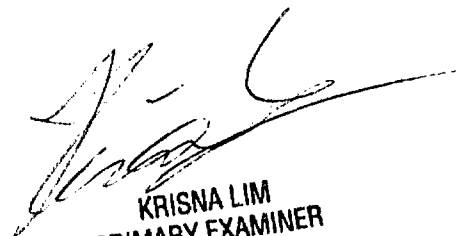
1. An Examiner's Amendment to make a minor editorial change to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 C.F.R. § 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the Issue Fee.

2. The title has been amended as follows:

"An internet filtering system for filtering data transferred over the internet utilizing immediate and deferred filtering actions".

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to V. Vu whose telephone number is (703) 305-9597.

V. Vu  
September 18, 1998

  
KRISNA LIM  
PRIMARY EXAMINER





UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office

NOTICE OF ALLOWANCE AND ISSUE FEE DUE

UNIT 100000

1000 1000 1000  
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APPLICATION NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
0000000000	00/00/00	000	000 000	00/00/00
First Named Applicant	0000000000			

TITLE OF INVENTION 0000000000 SYSTEM FOR 0000000000 0000000000 0000000000  
0000000000 0000000000 0000000000 0000000000  
(0000000000)

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
0000000000	0000000000	0000000000	0000000000	0000000000	0000000000	00/00/00

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:

A. If the status is changed, pay twice the amount of the FEE DUE shown above and notify the Patent and Trademark Office of the change in status, or

B. If the status is the same, pay the FEE DUE shown above.
- If the SMALL ENTITY is shown as NO:

A. Pay FEE DUE shown above, or

B. File verified statement of Small Entity Status before, or with, payment of 1/2 the FEE DUE shown above.
- II. Part B-Issue Fee Transmittal should be completed and returned to the Patent and Trademark Office (PTO) with your ISSUE FEE. Even if the ISSUE FEE has already been paid by charge to deposit account, Part B Issue Fee Transmittal should be completed and returned. If you are charging the ISSUE FEE to your deposit account, section "4b" of Part B-Issue Fee Transmittal should be completed and an extra copy of the form should be submitted.
- III. All communications regarding this application must give application number and batch number. Please direct all communications prior to issuance to Box ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.



111①

4100

AFM

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Wm. Duvall *and* M. Kendall

Serial No. 08/645,636

Filed: May 15, 1996

For: An Internet Filtering System For  
Filtering Data Transferred Over The  
Internet Utilizing Immediate And  
Deferred Filtering Actions (as  
amended)

Art Unit: 2758

Examiner: Vu, V.

Atty. Docket: 06650.0002

Batch No. J80

**Letter to PTO Draftsman:  
Submission of Formal Drawings**

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

Submitted herewith are 6 sheets of formal drawings with Figures 1, 2, 3, 4, 5(a), 5(b), 5(c) and 5(d), corresponding to the informal drawings submitted with the above-captioned application. The application number, group art unit and attorney docket number appear on the back of each sheet. Acknowledgment of the receipt, approval, and entry of these formal drawings into this application is respectfully requested.

It is not believed that an extension of time is required, other than any already provided herewith. However, if an extension of time is needed to prevent abandonment of the application, then such extension of time is hereby petitioned. The U.S. Patent and Trademark Office is hereby authorized to charge any fee deficiency, or credit any overpayment, to our Deposit Account No. 08-3038.

Respectfully submitted,

*Timothy L. Scott*

Timothy L. Scott  
Registration No. 37,931

Date: December 18, 1998

HOWREY & SIMON  
Box No. 34  
1299 Pennsylvania Avenue, NW  
Washington, D.C. 20004-2402  
(202) 783-0800



APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

**5884033**

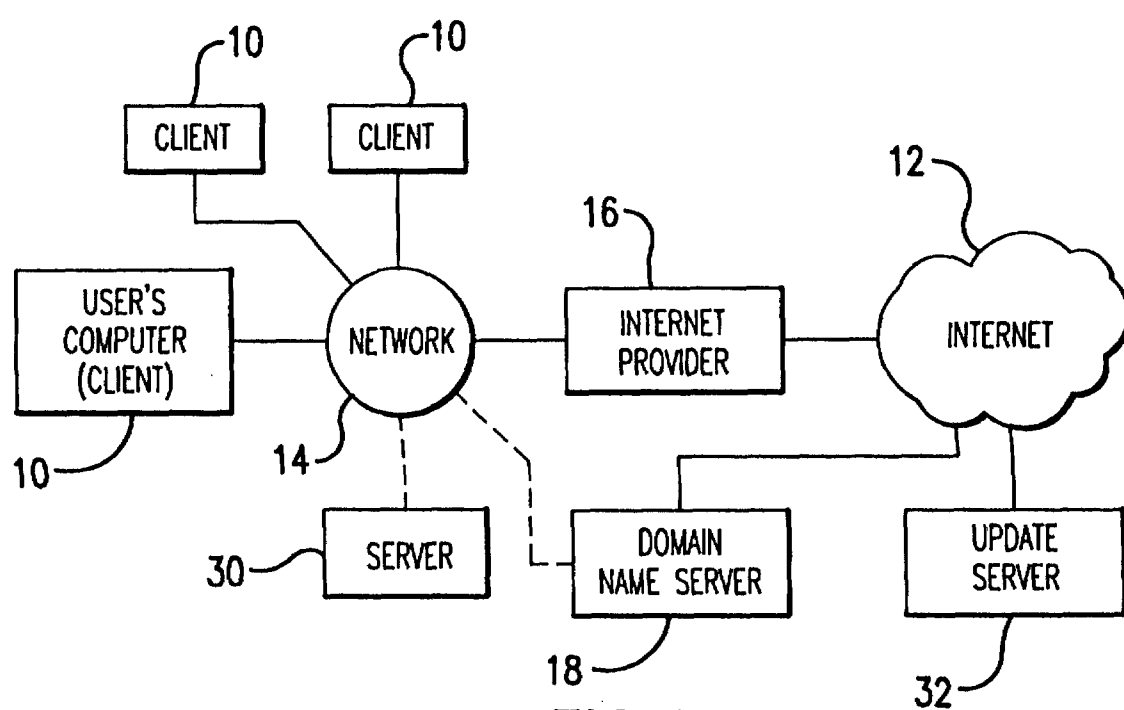


FIG. 1

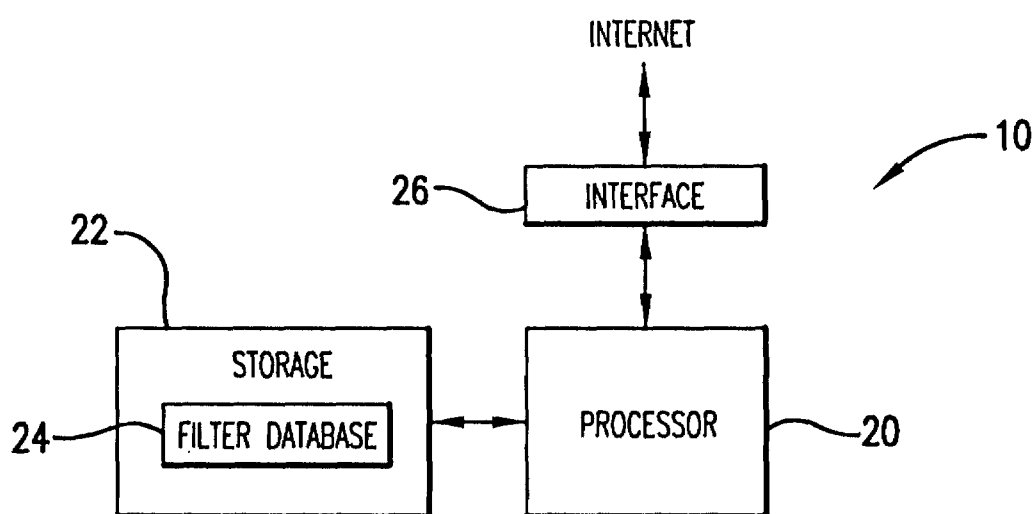


FIG.2



Howrey & Simon Docket No. 06650.0002  
Serial No. 08/645,636  
Group Art Unit 2758  
Sheet 1 of 6  
Batch No. J80



APPROVED	C.C. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

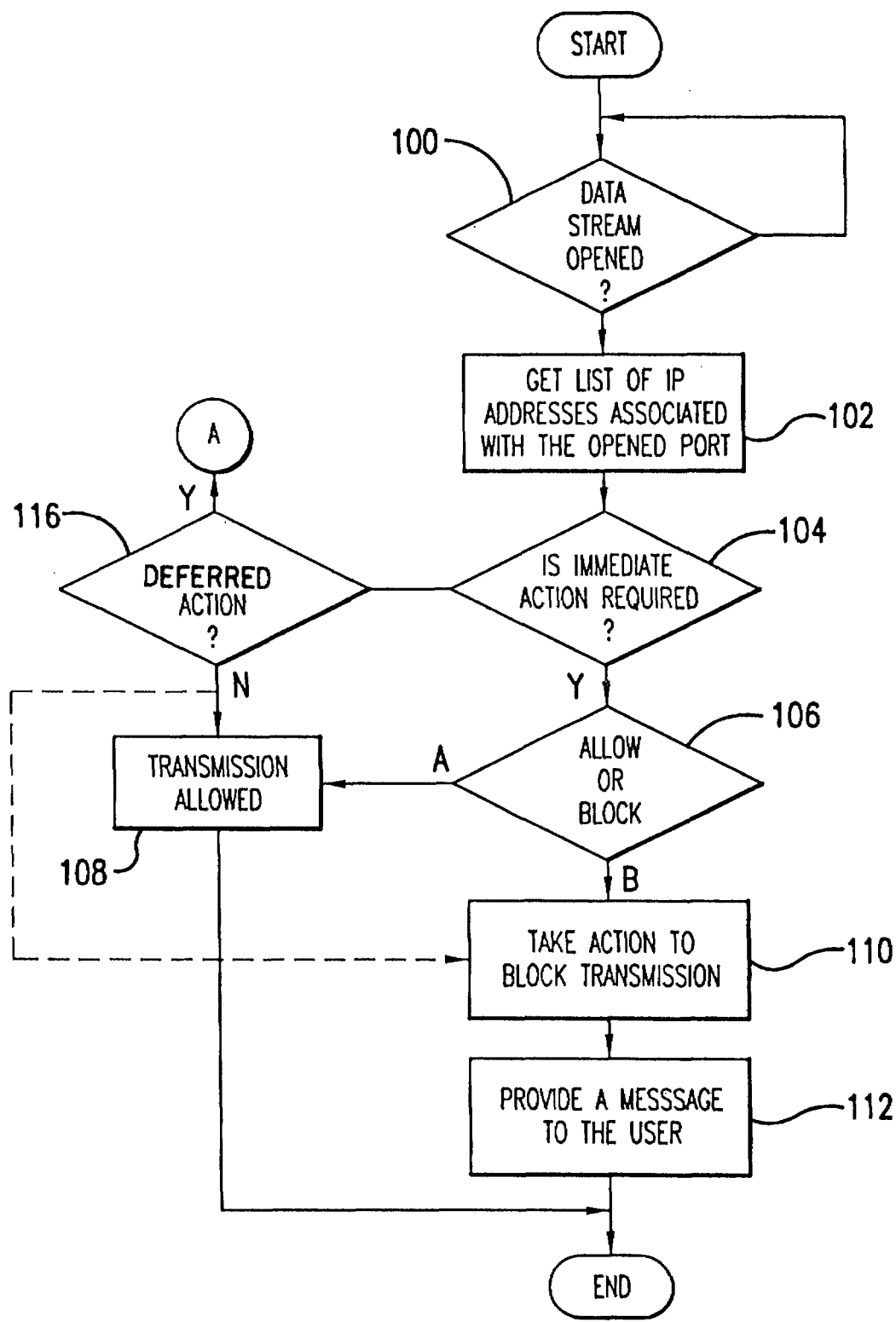


FIG.3



APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

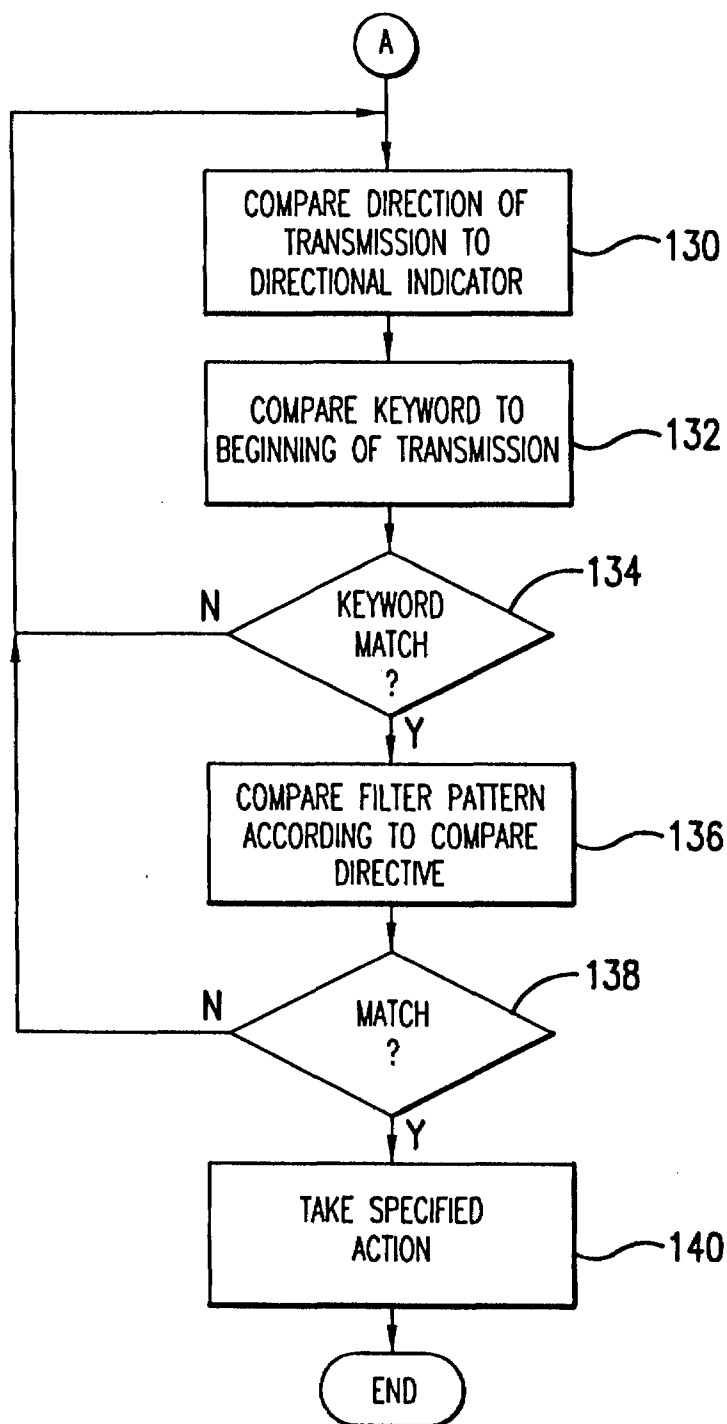


FIG.4



APPROVED	O.C. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

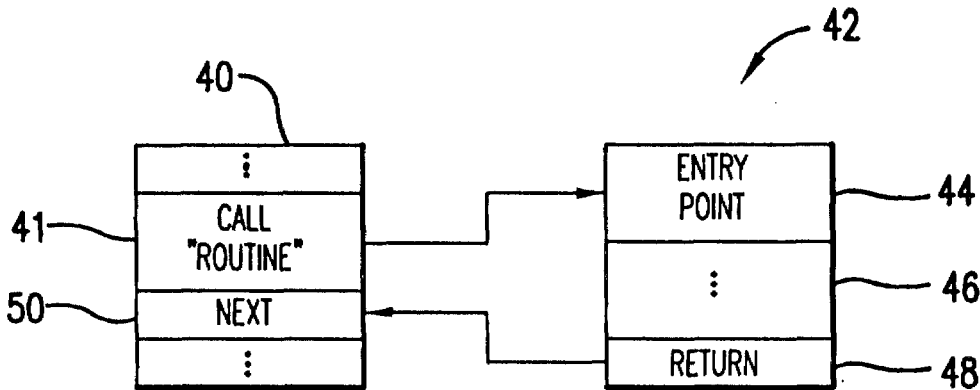


FIG. 5(a)  
PRIOR ART

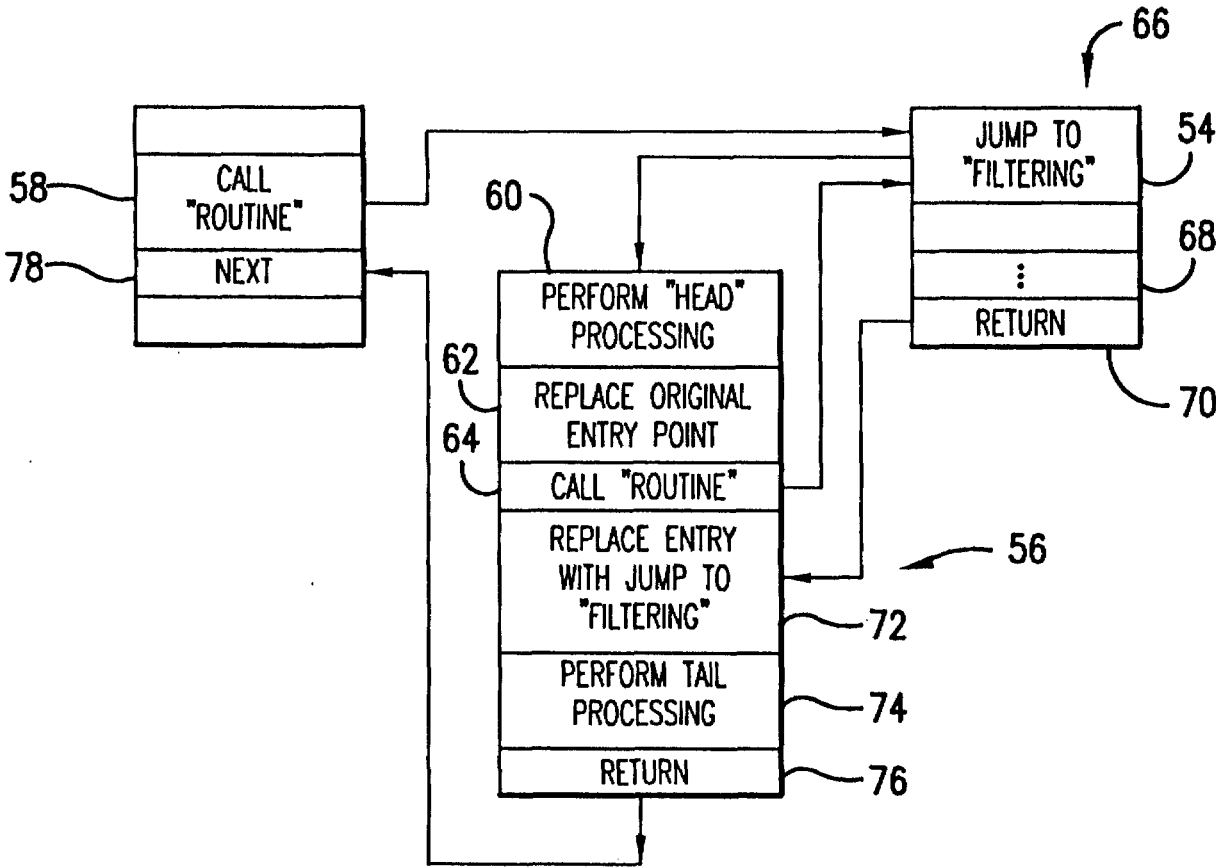


FIG. 5(b)



APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

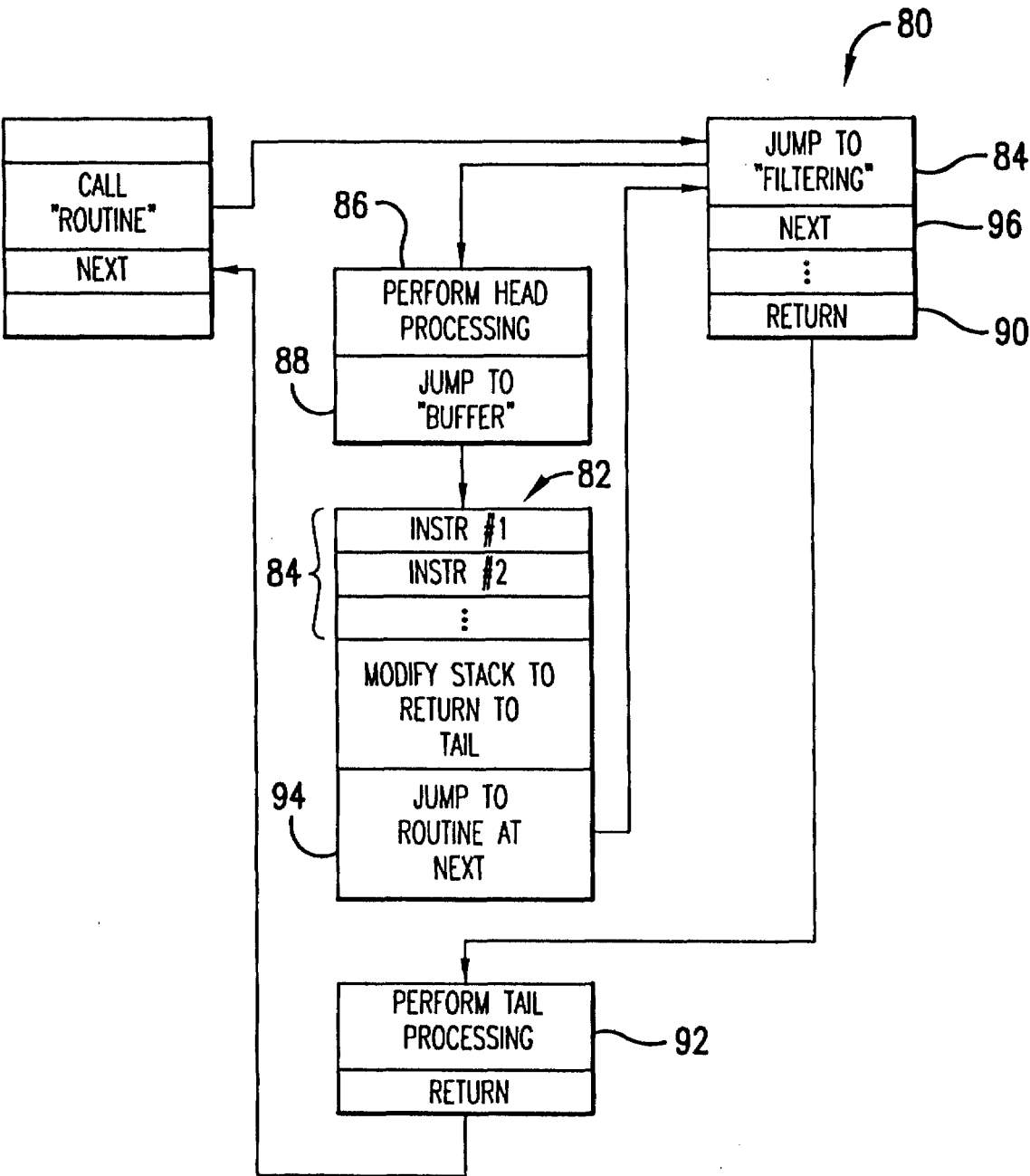


FIG. 5(c)



**HOWREY & SIMON**

December 18, 1998

Attorneys at Law  
1299 Pennsylvania Ave., NW  
Washington, DC 20004-2402  
(202) 783-0800  
FAX (202) 383-6610

Assistant Commissioner for Patents  
Washington, D.C. 20231

Re: U.S. Allowed Utility Patent Application

*Attn. Box Issue Fee  
Batch No. J80*

Application No. 08/645,636; Filed: May 15, 1996

For: An Internet Filtering System For Filtering Data Transferred Over  
The Internet Utilizing Immediate And Deferred Filtering Actions  
(as amended)

Inventors: William Duvall, Kenneth Randall

Our Ref: 06650.0002

Sir:

RECEIVED  
Publishing Division  
DEC 18 1998  
16

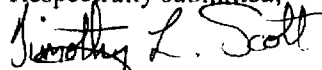
In response to the **Notice of Allowance and Issue Fee Due** dated **September 29, 1998** the following documents are forwarded for appropriate action by the U.S. Patent and Trademark Office:

1. Issue Fee Transmittal (Form PTOL-85B);
2. Letter to the Official Draftsman;
3. 6 sheets of formal drawings, approval of which is respectfully requested;
4. Return postcard; and

It is respectfully requested that the attached postcard be stamped with the date of filing of these documents, and that it be returned to our courier.

**The U.S. Patent and Trademark Office is hereby authorized to charge the Issue Fee and the cost of 10 advance order soft copies, to our Deposit Account No. 08-3038.** If extensions of time under 37 C.F.R. 1.136 other than those otherwise provided for herewith are required to prevent abandonment of the present patent application, then such extensions of time are hereby petitioned, and any fees therefor are hereby authorized to be charged to our Deposit Account No. 08-3038. A duplicate copy of this letter is enclosed.

Respectfully submitted,



Timothy L. Scott  
Registration No. 37,931

Enclosures



# 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**

**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)

HOWREY & SIMON  
 BOX NO. 34  
 1299 PENNSYLVANIA AVE., NW  
 WASHINGTON DC 20004-2402

RECEIVED  
 Publishing Division  
 DEC 18 1998  
 16

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.

(Depositor's name)

(Signature)

(Date)

APPLICATION NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
08/645,636	05/15/96	024	VU, V	2758 09/29/98
First Named Applicant: DUVALL, WILLIAM S.				

TITLE OF INVENTION: AN INTERNET FILTERING SYSTEM FOR FILTERING DATA TRANSFERRED OVER THE INTERNET UTILIZING IMMEDIATE AND DEFERRED FILTERING ACTIONS (AS AMENDED)

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
2	103.728.127	395-200.360	J80	UTILITY	YES \$660.00	12/29/98

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 HOWREY & SIMON

2

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 appropriate when an assignment has been previously submitted to the PTO or is being submitted under separate cover. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: Spyglass, Inc.

(B) RESIDENCE: (CITY & STATE OR COUNTRY) Naperville, IL

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

4b. The following fees or deficiency in these fees should be charged to:

DEPOSIT ACCOUNT NUMBER 08-3038  
 (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)

Jonathan L. Scott

(Date)

12/18/98

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.

**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

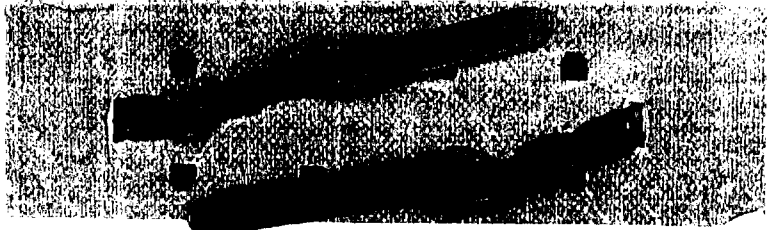
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

12/22/1998 HTHA11 00000049 083678 08645672  
 01 FC-242 605.00 CH  
 02 FC-2561 39.00 CH

TRANSMIT THIS FORM WITH FEE

Apple 1007.0120





PTO UTILITY GRANT  
Paper Number 70

**The Commissioner of Patents  
and Trademarks**

*Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.*

*Therefore, this*

**United States Patent**

*Grants to the person(s) having title to this patent the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States of America or importing the invention into the United States of America for the term set forth below, subject to the payment of maintenance fees as provided by law.*

*If this application was filed prior to June 8, 1995, the term of this patent is the longer of seventeen years from the date of grant of this patent or twenty years from the earliest effective U.S. filing date of the application, subject to any statutory extension.*

*If this application was filed on or after June 8, 1995, the term of this patent is twenty years from the U.S. filing date, subject to an statutory extension. If the application contains a specific reference to an earlier filed application or applications under 35 U.S.C. 120, 121 or 365(c), the term of the patent is twenty years from the date on which the earliest application was filed, subject to any statutory extension.*

*Bence Lehman*  
Commissioner of Patents and Trademarks

*Ollie M. Person*  
Attest

The  
United  
States  
of  
America



Form PTO-1584 (Rev. 2/87)



SEP-13-02 13:03 From:

T-496 P.01/02 Job-595

08/645,636  
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
(Case No. 99-458)

9200

In re Application of: )  
 )  
Duvall, et al )  
 )  
Patent No.: 5,884,033 )  
 )  
Issued: March 16, 1999 )  
 )  
For: Internet Filtering System for Filtering Data )  
Transferred over the Internet Utilizing )  
Immediate and Deferred Filtering Actions )

**FACSIMILE TRANSMITTAL LETTER**

Commissioner for Patents  
Washington, D.C. 20231  
Facsimile No.: (703) 308-7751

Dear Sir:

In regard to the above identified application,

1. We are transmitting herewith the attached:

a) Notification of Change in Entity Status.

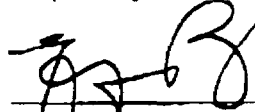
2. With respect to fees:

a) No fee is due.

b) Please charge any underpayment or credit any overpayment to our Deposit Account, No. 13-2490.

3. CERTIFICATE OF TRANSMISSION UNDER 37 CFR § 1.8: The undersigned hereby certifies that this Transmittal Letter and the paper, as described in paragraph 1 above, are being transmitted via facsimile (703) 308-7751 to the Commissioner of Patents, Washington, D.C. 20231 on September 13, 2002.

Respectfully submitted,

  
Enrique Perez  
Registration No. 43,853

Date: September 13, 2002

McDonnell Boehnen Hulbert & Berghoff  
300 South Wacker Drive  
Chicago, IL 60606  
(312) 913-0001



SEP-13-02 13:03 From:

T-496 P.02/02 Job-595

**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
(Case No. 99-458)**

In re Application of: )  
 )  
Duvall, et al )  
 )  
Serial No.: 5,884,033 )  
 )  
Issued: March 16, 1999 )  
 )  
For: Internet Filtering System for Filtering Data )  
Transferred over the Internet Utilizing )  
Immediate and Deferred Filtering Actions )

**NOTIFICATION OF CHANGE IN ENTITY STATUS**

Commissioner for Patents  
Washington, D.C. 20231  
Facsimile No.: (703) 308-7751

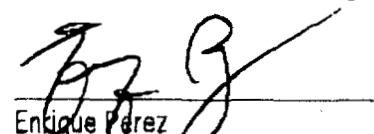
Sir:

Pursuant to 37 C.F.R. 1.27, notice is hereby given that the owner of the above-identified patent no longer enjoys small entity status. All fees paid to-date have been properly calculated, such that there is no deficiency.

Respectfully submitted,  
**McDonnell Boehnen Hulbert & Berghoff**

Date: September 13, 2002

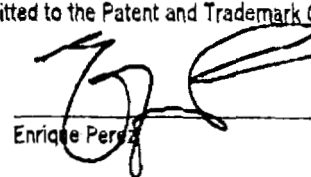
By:

  
Enrique Perez  
Registration No. 43,853

**CERTIFICATE OF TRANSMISSION UNDER 37 CFR § 1.8:**

The undersigned hereby certifies that this paper is being facsimile transmitted to the Patent and Trademark Office (Fax No. (703) 308-7751) on this 13<sup>th</sup> day of September 2002

Date: September 13, 2002

  
Enrique Perez

Apple 1007.0123





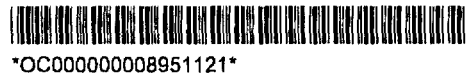
UNITED STATES PATENT AND TRADEMARK OFFICE

COMMISSIONER FOR PATENTS  
UNITED STATES PATENT AND TRADEMARK OFFICE  
WASHINGTON, DC 20231  
www.uspto.gov

APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
08/645,636	05/15/1996	WILLIAM S. DUVALL	103.728.127

CONFIRMATION NO. 5698

20306  
MCDONNELL BOEHNEN HULBERT & BERGHOFF  
300 SOUTH WACKER DRIVE  
SUITE 3200  
CHICAGO, IL 60606



\*OC000000008951121\*

Date Mailed: 10/15/2002

RESPONSE TO REQUEST FOR CORRECTED FILING RECEIPT

Publication and General Rules Issues

In response to your request for a corrected Filing Receipt, the Office is unable to comply with the request because:

- ☐ The articles such as "a", "an", and "the" are not included as the first words in the title of an application. They are considered to be unnecessary to the understanding of the title.
- ☐ The words "new", "improved", "improvement of", "improvement in", or "improvement relating to" are not included as the first words in the title of an application because a patent application is, by nature, a new idea or improvement. See MPEP 606.
- ☐ The title appears on the filing receipt in sentence case for publication in the Annual Index of Patents.
- ☐ Amendments are not accepted in provisional applications. See 37 CFR 1.53(c).
- ☐ An amendment or Application Data Sheet is needed to make this change.
- ☐ The inventor's residence will only include the city and state for U.S. residences or city and country for residences outside the U.S. (See MPEP 605.02.)
- ☐ Continuity claimed under 35 USC 120 cannot be added to the Filing Receipt without the applicant supplying the relationship (continuation, divisional, or continuation-in-part) in an Application Data Sheet or amendment to the first page of the specification.

☐ Small entity status was previously claimed in this application. To notify the Office of a loss of



☒ entitlement to small entity status, see 37 CFR 1.27(g). To have a good faith error in claiming small entity status excused, see 37 CFR 1.28(c).

☐ The request for non-publication was not timely filed. A request for non-publication must be submitted upon filing of an application. The application is scheduled to be published on the date specified on the filing receipt. See 37 CFR 1.213(a)(1)

☐ The request for non-publication has not been recognized because it is not conspicuous as required by 37 CFR 1.213(a)(2)

☐ The request for non-publication has not been recognized because it does not contain the certification as required by 37 CFR 1.213(a)(3).

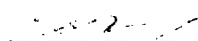
☐ The request for non-publication has not been recognized because it is not signed in compliance with 37 CFR 1.33(b) as required by 37 CFR 1.213(a)(4).

☐ There was no prior request for non-publication in this application. The request to rescind the non-publication request will not be processed.

☐ Your request for non-publication will not be acknowledged because this application is not eligible for publication. Only utility and plant applications filed on or after November 29, 2000 are eligible for publication.

☐ The "Non-Publication Request" indicator is correct. If there was a proper request submitted at the time of filing, the notation on the filing receipt will be "Yes". If no such request was made, the notation will be "No".

☐ Assignment information will only be included for applications that are eligible for publication.

  
\_\_\_\_\_  
Customer Service Center  
Office of Initial Patent Examination  
(703) 308-1202



PATENT APPLICATION SERIES **08/645636**

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



DRAFT

AMENDED CLAIMS

1. (Amended) A method for communicating with servers over the Internet, the method comprising computer-implemented steps of:

(a) opening a data stream to send a message through an interface to an Internet server;

(b) maintaining a database of filtering information comprising a table of filters, said table comprising

(1) filters specifying immediate action, and

(2) filters specifying deferred action;

(c) comparing information in the message to filtering information in the database; and

(d) determining whether to prevent or allow the outgoing transmission of the message based on the comparison.

2. (Amended) The method of claim 1, wherein [step (b) includes maintaining a table of filters, and wherein] some of the filters indicate that the message should be sent, and others indicate that the message should be blocked.

3. (Amended) The method of claim 1, wherein in step (b) [includes maintaining filters that specify] the filters specifying immediate action comprise fields specifying an interface port, an Internet Protocol (IP) address, and an action to be taken if the filtering information matches the information in the message.

4. (Amended) The method of claim [1] 3, wherein step (c) includes comparing an Internet Protocol (IP) address of the message to the filtering information.

5. (Amended) The method of claim [1] 23, wherein the message includes a URL [request], and step (c) includes comparing a domain name in the URL to the filtering information.

6. (Amended) The method of claim 5, wherein step (c) includes comparing file [and/or directory] information in the URL to the filtering information.

7. (Amended) The method of claim [1] 23, wherein step (c) includes comparing a command after a connection has been opened to the filtering information.



1 10. (Amended) The method of claim [9] 23, wherein step (c) includes comparing strings in  
2 the message against strings in filter entries in the filter database, the strings in the filter database  
3 being maintained based on the least common string in the filter entry.

1 11. (Amended) The method of claim [1] 8, further comprising a step of updating the  
2 database by downloading new filtering information from an update server, the update server  
3 being accessible to the client computer [computers] over the Internet.

1 13. (Amended) The method of claim [1] 23, wherein the message includes a URL,  
2 wherein step (c) includes comparing a command in the URL to the filtering information.

1 15. (Amended) A method for filtering messages transmitted over the Internet, the method  
2 comprising computer-implemented steps of:

3 (a) maintaining a database of filtering information comprising a table of filters, said  
4 table comprising

5 (1) filters specifying immediate action, and

6 (2) filters specifying deferred action;

7 (b) comparing information in the Internet message to filtering information in the  
8 database; and

9 (c) determining whether to prevent or allow transmission of the message in response  
10 to the comparison[]; and

11 (d) updating the filtering information by downloading from a remote server via the  
12 Internet new filter information for storage in the database of filter information].

1 16. (Amended) The method of claim [15] 25, wherein step (d) includes replacing the  
2 existing filter information with the new filter information.

1 17. (Amended) The method of claim [15] 25, wherein the update server has a number of  
2 sets of new filter information, the method further including a step of providing to the server a  
3 message indicating which set of filters to download.

1 18. (Amended) A method for communicating with servers over the Internet, the method  
2 comprising the computer implemented steps of:



- 3 (a) sending messages to and [receive] receiving messages from an Internet server  
4 through an interface;  
5 (b) maintaining a database of filtering information comprising a table of filters, said  
6 table comprising  
7 (1) filters specifying immediate action, and  
8 (2) filters specifying deferred action;  
9 (c) comparing information in the messages to filtering information in the database;  
10 and  
11 (d) determining whether to prevent or allow transmission of the messages based on  
12 the comparison[.];

13 wherein steps (a) – (d) are performed by a client computer connected to the Internet through a  
14 network server.

1 22. (Amended) A method of executing a hard patch for a called computer routine  
2 comprising the computer-implemented steps of:

- 3 (a) copying instructions from an entry point of a called routine to a buffer;  
4 (b) providing an application calling the called routine;  
5 (c) jumping from the called routine to a head processing routine;  
6 (d) performing the head processing routine;  
7 (e) jumping to the buffer;  
8 (f) executing the copied instructions;  
9 (g) returning to the called routine after the jump of step (c);  
10 (h) returning to a tail processing routine;  
11 (I) performing the tail processing routine; and  
12 (j) returning to the calling application.



Please add the following new claims:

- 1 27. (New) The method of claim 1, wherein in step (b) the filters specifying deferred action  
2 comprise fields specifying a keyword, a filter pattern, a compare directive, and an action to be  
3 taken if the filtering information matches information in the message.
- 1 28. (New) The method of claim 5, wherein step (c) include comparing directory information  
2 in the URL to the filtering information.
- 1 29. (New) The method of claim 15, further comprising a step (d) of updating the filtering  
2 information by downloading from a remote server via the Internet new filter information for  
3 storage in the database of filter information.
- 1 30. (New) The method of claim 18, wherein step (d) comprises a determination to prevent  
2 transmission of the messages, the method further comprising steps of buffering the messages in a  
3 buffer, discarding at least part of the incoming messages, and displaying a message indicating that  
4 the transmission was prevented.
- 1 31. (New) The method of claim 18, wherein in step (b) the filters specifying deferred action  
2 comprise fields specifying a keyword, a filter pattern, and an action to be taken if the filtering  
3 information matches information in the messages.
- 1 32. (New) The method of claim 18, step (c) including comparing messages sent to the  
2 Internet, the method further comprising the step of queueing the filtering information.
- 1 33. (New) A method for communicating with servers over the Internet, the method  
2 comprising the computer-implemented steps of:
  - 3 (a) opening a data stream to receive a message through an interface from an Internet  
4 server;
  - 5 (b) maintaining a database of filtering information comprising a table of filters, said  
6 table comprising
  - 7 (c) filters specifying immediate action, and
  - 8 (d) filters specifying deferred action;
  - 9 (e) comparing information in the message to filtering information in the database; and



10        (f)     determining whether to prevent or allow the outgoing transmission of the message  
11        based on the comparison.



## PATENT APPLICATION FEE DETERMINATION RECORD

Effective October 1, 1995

Application or Docket Number

08/645636

## CLAIMS AS FILED - PART I

(Column 1)

(Column 2)

SMALL ENTITY

OR

OTHER THAN  
SMALL ENTITY

FOR	NUMBER FILED	NUMBER EXTRA
BASIC FEE		
TOTAL CLAIMS	26 minus 20 =	* 6
INDEPENDENT CLAIMS	4 minus 3 =	* 1
MULTIPLE DEPENDENT CLAIM PRESENT		

RATE	FEE
	375.00
x\$11=	66
x39=	39
+125=	
TOTAL	480

RATE	FEE
	750.00
x\$22=	132
x78=	1/8
+250=	
TOTAL	960

\* If the difference in column 1 is less than zero, enter "0" in column 2

## CLAIMS AS AMENDED - PART II

(Column 1)

OVER INDEPENDENT 30 IN COLUMN 3

SMALL ENTITY

OR

OTHER THAN  
SMALL ENTITY

AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	* 28	Minus ** 26	= 2
Independent	* 5	Minus *** 4	= 1
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM			

RATE	ADDITIONAL FEE
x\$11=	22
x39=	41
+125=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
x\$22=	
x78=	
+250=	
TOTAL ADDIT. FEE	

AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	*	Minus **	=
Independent	*	Minus ***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM			

RATE	ADDITIONAL FEE
x\$11=	
x39=	
+125=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
x\$22=	
x78=	
+250=	
TOTAL ADDIT. FEE	

AMENDMENT C	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	*	Minus **	=
Independent	*	Minus ***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM			

RATE	ADDITIONAL FEE
x\$11=	
x39=	
+125=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
x\$22=	
x78=	
+250=	
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.



## PATENT APPLICATION FEE DETERMINATION RECORD

Effective October 1, 1996

Application or Docket Number

08/645/636

## CLAIMS AS FILED - PART I

(Column 1)

(Column 2)

FOR	NUMBER FILED	NUMBER EXTRA
BASIC FEE		
TOTAL CLAIMS	28 <del>35</del> minus 20 =	* 8 + 3
INDEPENDENT CLAIMS	5 minus 3 =	* 2
MULTIPLE DEPENDENT CLAIM PRESENT		

SMALL ENTITY

OR

OTHER THAN  
SMALL ENTITY

RATE	FEE		RATE	FEE
	395			
	385.00	OR		770.00
x\$11=	88	OR	x\$22=	286
440=	82	OR	x80=	164
+130=		OR	+260=	
TOTAL		OR	TOTAL	

\* If the difference in column 1 is less than zero, enter "0" in column 2.  
VER Payment 39.0  
Code 203 - 39.0

## CLAIMS AS AMENDED - PART II

(Column 1)

(Column 2)

(Column 3)

SMALL ENTITY

OR

OTHER THAN  
SMALL ENTITY

AMENDMENT A		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total	* 24	Minus	** 28	=
	Independent	* 3	Minus	*** 5	=
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

RATE	ADDI- TIONAL FEE		RATE	ADDI- TIONAL FEE
x\$11=		OR	x\$22=	
x40=		OR	x80=	
+130=		OR	+260=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total	*	Minus	**	=
	Independent	*	Minus	***	=
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

RATE	ADDI- TIONAL FEE		RATE	ADDI- TIONAL FEE
x\$11=		OR	x\$22=	
x40=		OR	x80=	
+130=		OR	+260=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT C		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total	*	Minus	**	=
	Independent	*	Minus	***	=
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				

RATE	ADDI- TIONAL FEE		RATE	ADDI- TIONAL FEE
x\$11=		OR	x\$22=	
x40=		OR	x80=	
+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.



INVENTOR NAME Bell DATE 6-21-76  
FIRST INVENTOR NAME MIT DATE 6-15-76

CLASS 395  
SHEETS OF DRAWING 6

GROUP ART UNIT 2317  
SPECIAL CATEGOR 0

MONTH 05 YEAR 1596  
FILING FEE 545

INDEPENDENT CLAIMS 4  
TOTAL CLAIMS 26

ATTORNEY DOCKET NUMBER 103.728.127

FOREIGN LICENSE Y

SMALL ENTITY 02

CONTINUITY DATA

CONT STATUS CODE	STATUS CODE	PARENT APPLICATION SERIAL NUMBER	PCT APPLICATION SERIAL NUMBER	PCT APPLICATION SERIAL NUMBER	PARENT PATENT NUMBER	PARENT FILING DATE		
						MONTH	DAY	YEAR
			P C T /	/				
			P C T /	/				
			P C T /	/				
			P C T /	/				
			P C T /	/				

PCT/FOREIGN APPLICATION DATA

FOREIGN PRIORITY CLAIMED	COUNTRY CODE	PCT/FOREIGN APPLICATION SERIAL NUMBER										FOREIGN FILING DATE		
												MONTH	DAY	YEAR



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POSITION	ID NO.	DATE
CLASSIFIER		
EXAMINER		
TYPIST	21	8/12/88
VERIFIER		
CORPS CORR.		
SPEC. HAND	217	8-15-86
FILE MAINT.	457	7-11-96
DRAFTING		

### INDEX OF CLAIMS

Claim		Date			
Final	Original				
1	1	✓	✓	✓	✓
2	2				
3	3				
4	4				
5	5				
6	6				
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10	10	✓	✓	✓	✓
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SYMBOLS

✓	Rejected
=	Allowed
-	(Through numeral) Canceled
+	Restricted
N	Non-elected
I	Interference
A	Appeal
O	Objected

Claim		Date			
Final	Original				
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SEARCHED			
Class	Sub.	Date	Exmr.
395	187.01 200.31 200.33 200.06 <sup>55</sup> 200.04 <sup>47</sup> 200.45 <sup>54</sup> <del>610</del> 707/10	6-27-97	v.✓
Updated 395	coll 200.31 200.32 200.34 200.35 200.36 200.37 200.47 200.54 200.55 200.8	3-24-98	✓✓
707 395	10 187.01		
395	651 652 712	7-28-98	v.✓
Updated	coll. 600	9-18-98	v.✓

INTERFERENCE SEARCHED			
Class	Sub.	Date	Exmr.
395	200.36 200.55 187.01	9-18-98	v.✓

SEARCH NOTES		
	Date	Exmr.
APS (U.S. PRO)	6-20-97	v.✓
APS	9-24-98	✓✓
APS	7-28-98	v.✓





US005884033A

# United States Patent [19]

Duvall et al.

[11] Patent Number: 5,884,033

[45] Date of Patent: \*Mar. 16, 1999

[54] INTERNET FILTERING SYSTEM FOR  
FILTERING DATA TRANSFERRED OVER  
THE INTERNET UTILIZING IMMEDIATE  
AND DEFERRED FILTERING ACTIONS

[75] Inventors: William S. Duvall, Portola Valley;  
Matthew Kendall, Palo Alto, both of  
Calif.

[73] Assignee: Spyglass, Inc., Naperville, Ill.

[\*] Notice: This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).

[21] Appl. No.: 645,636

[22] Filed: May 15, 1996

[51] Int. Cl.<sup>6</sup> ..... G06F 13/00

[52] U.S. Cl. .... 395/200.36; 395/20.55;  
395/187.01

[58] Field of Search ..... 395/187.01, 200.3,  
395/200.31, 200.55, 200.47, 200.54, 200.32,  
200.34, 200.35, 200.36, 200.37, 200.8,  
651, 652, 712; 707/10

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Primary Examiner—Krisna Lim

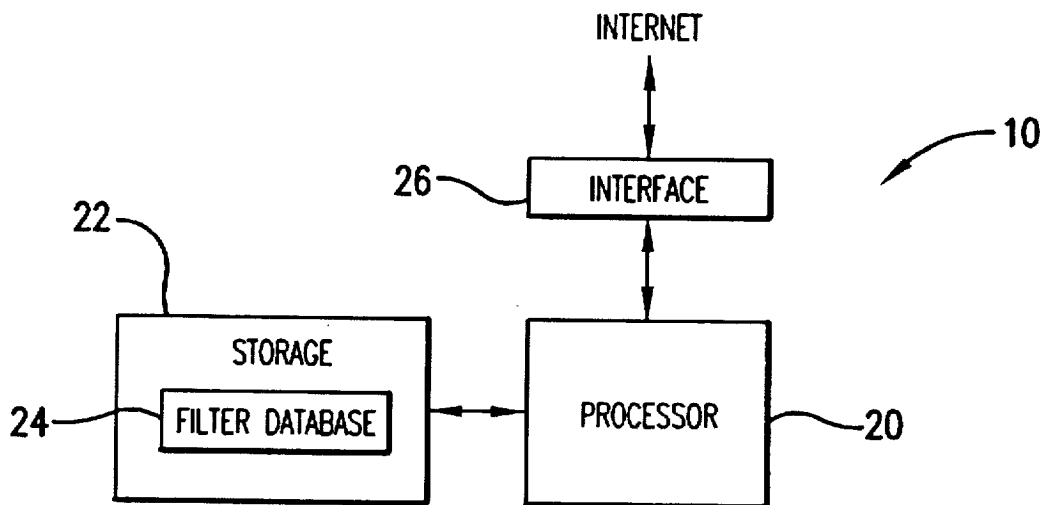
Assistant Examiner—Viet Vu

Attorney, Agent, or Firm—Howrey & Simon

[57] ABSTRACT

A client-based filtering system compares portions of incoming and/or outgoing messages to filtering information in a filter database, and determines whether to block or allow incoming and/or outgoing transmissions of messages in response to the comparison. In response to a match between the portion of the message and the filtering information, the system can employ one of a number of different specified blocking options. The system has an update server that is accessible over the Internet and that has new filtering information for updating the filter database. The filter database can have a filter database stored on a server in a network coupled to the client.

24 Claims, 6 Drawing Sheets





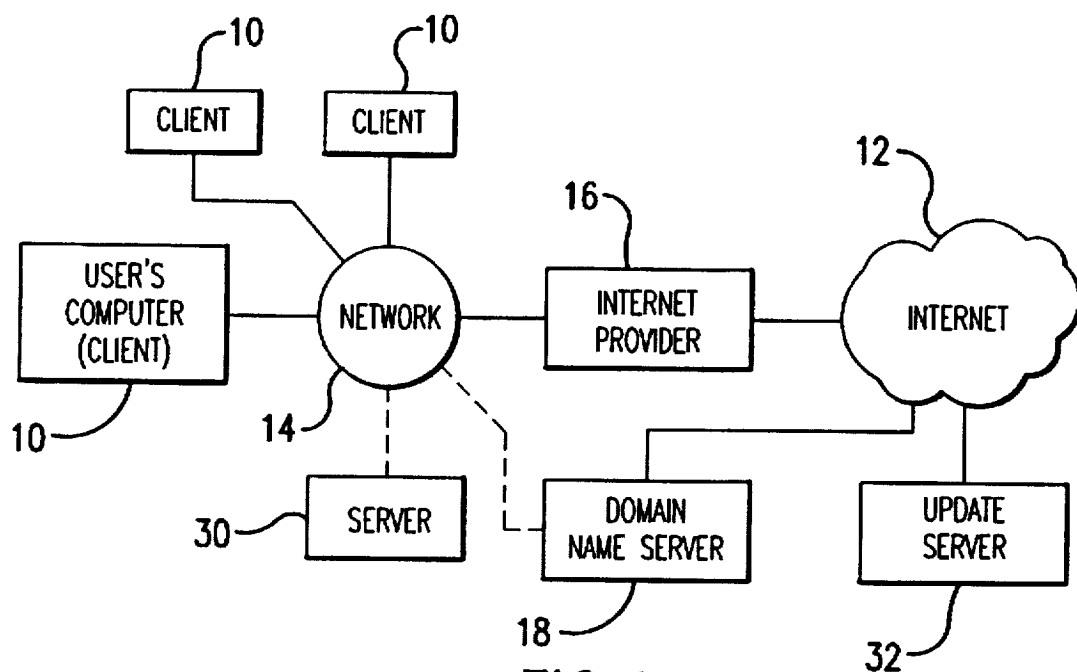


FIG. 1

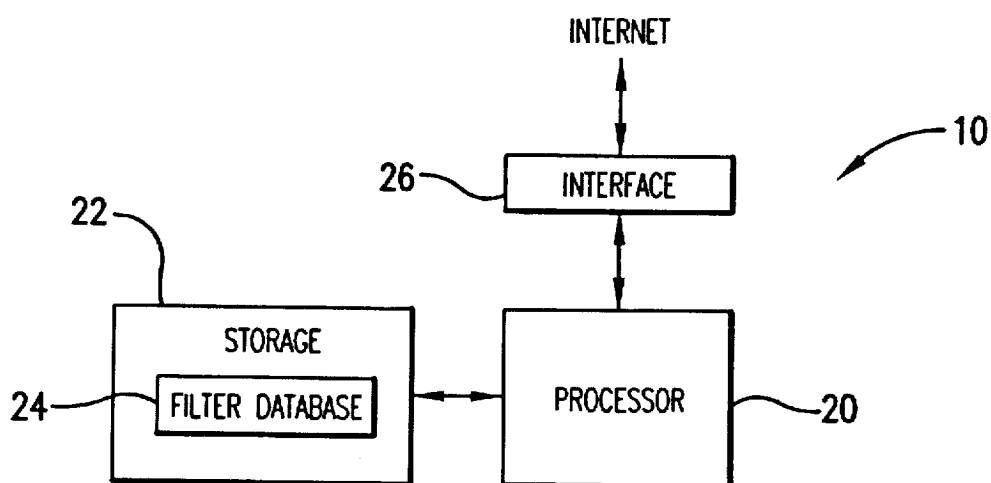


FIG. 2



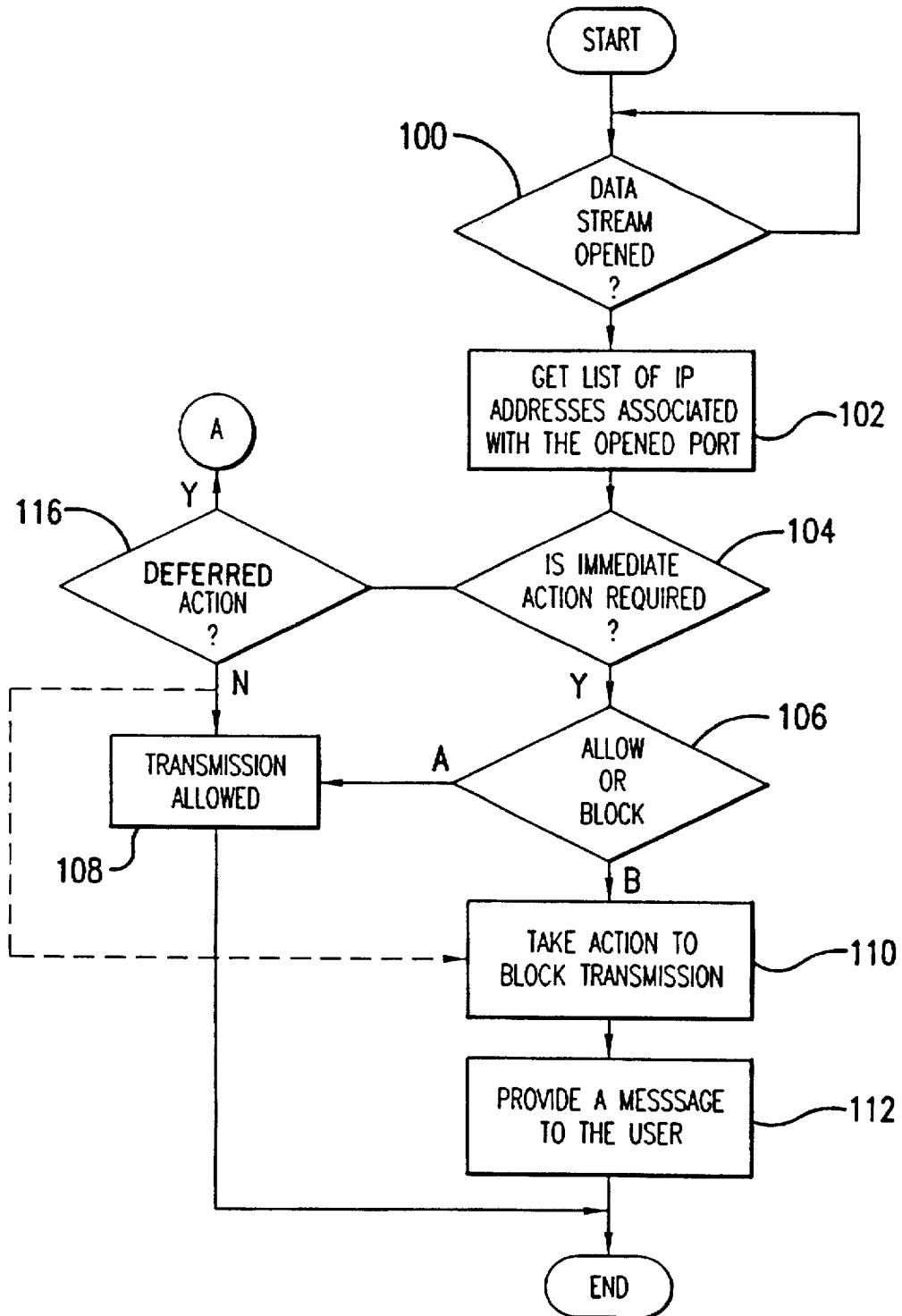


FIG. 3



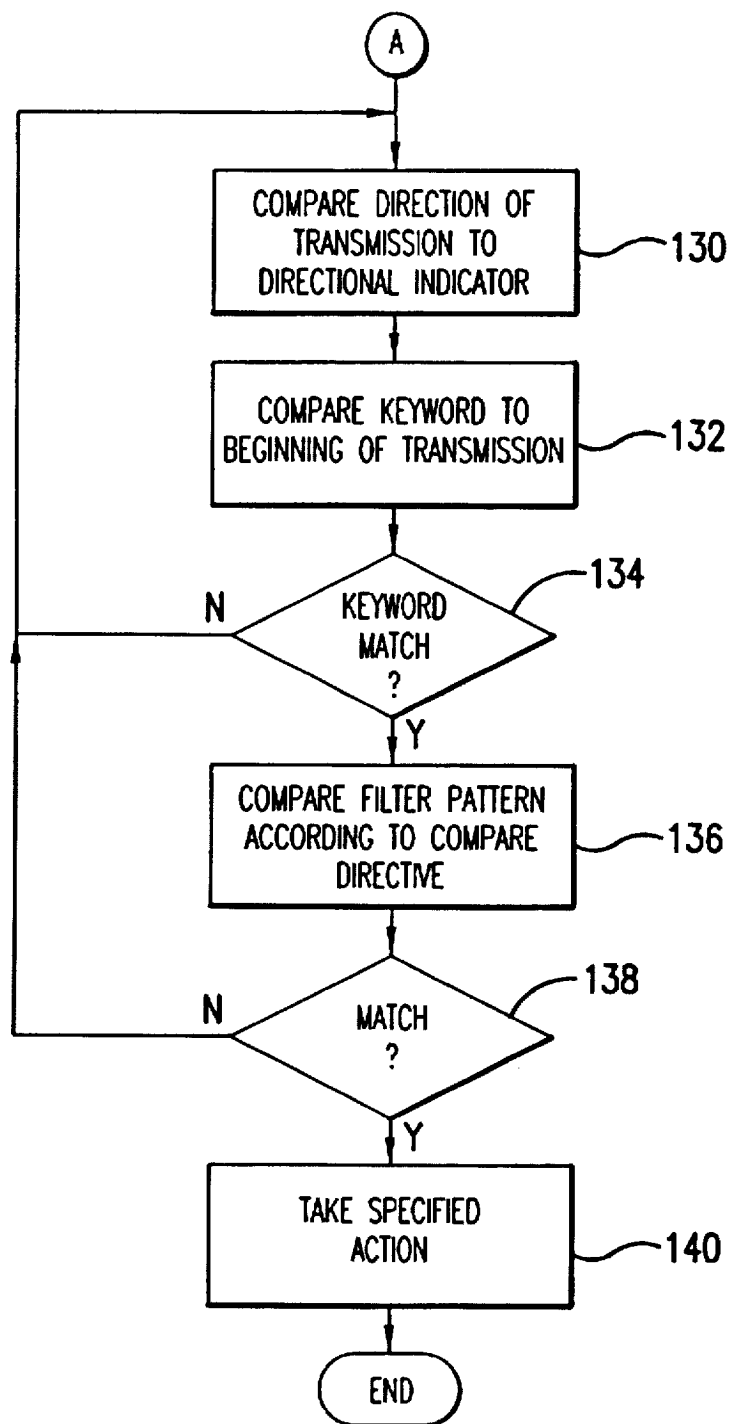


FIG. 4



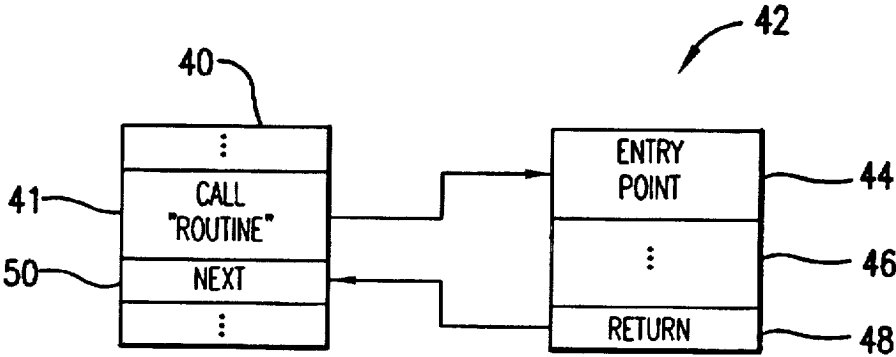


FIG. 5(a)  
PRIOR ART

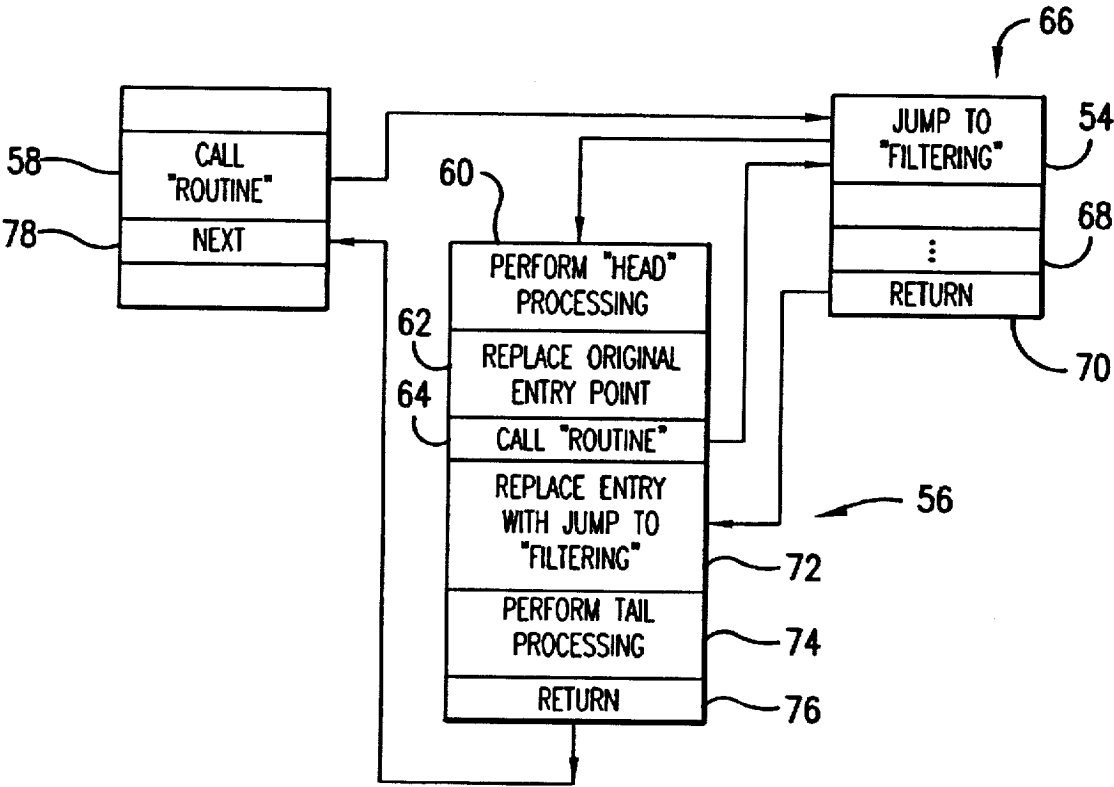


FIG. 5(b)



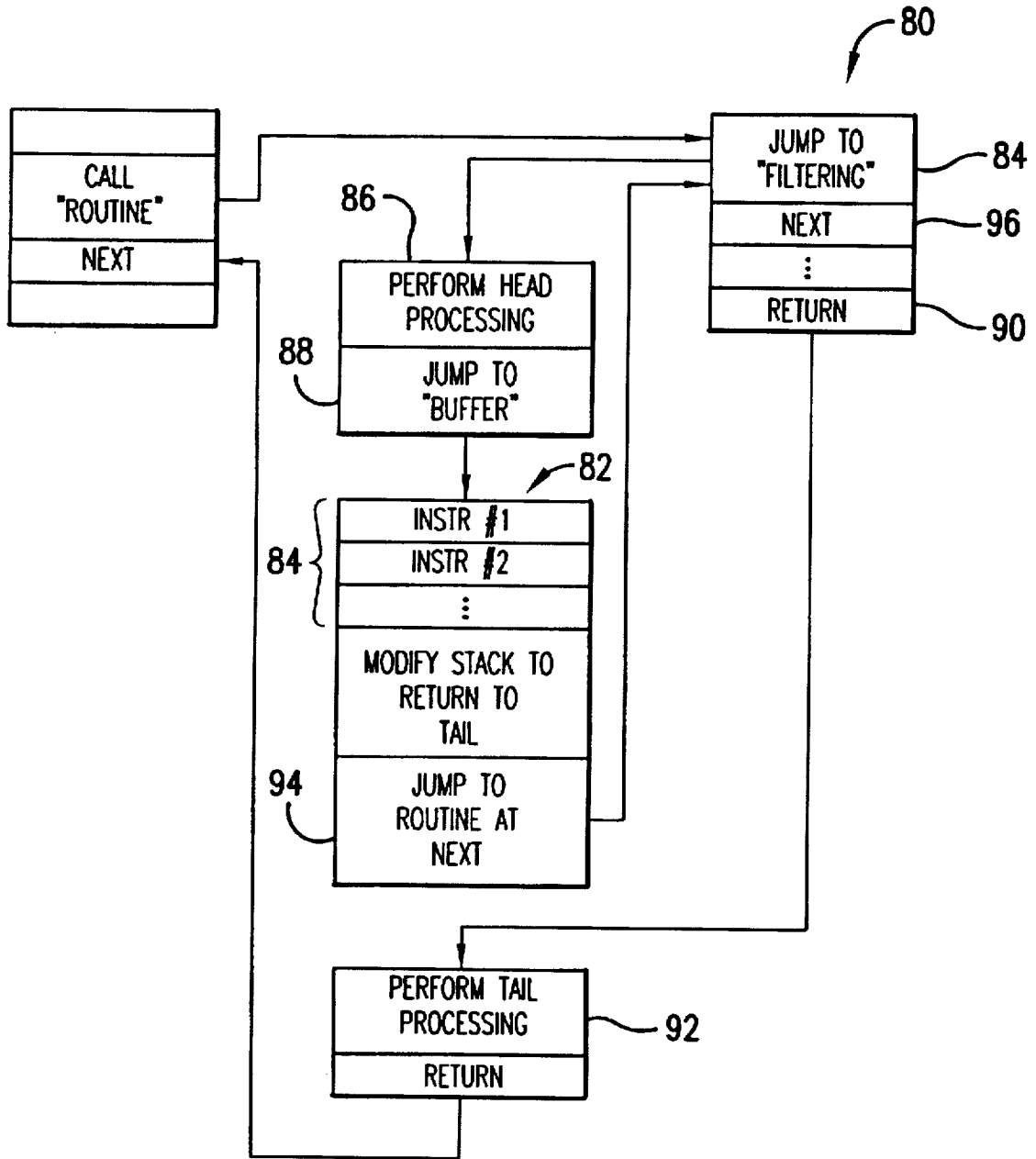


FIG. 5(c)



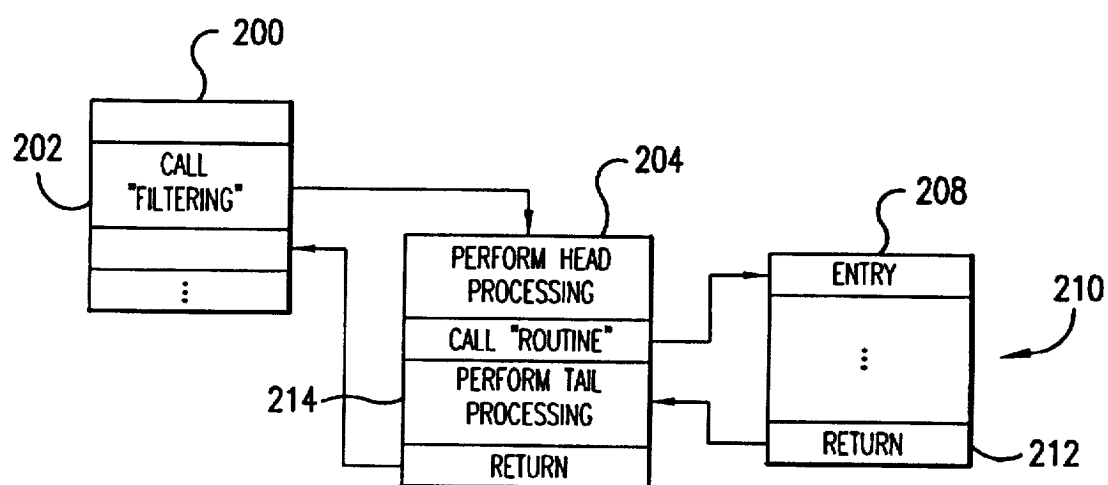


FIG. 5(d)



# INTERNET FILTERING SYSTEM FOR FILTERING DATA TRANSFERRED OVER THE INTERNET UTILIZING IMMEDIATE AND DEFERRED FILTERING ACTIONS

## FIELD OF THE INVENTION

This invention relates to a system for filtering messages transmitted between the Internet and a client computer.

## BACKGROUND OF THE INVENTION

While the Internet is very useful for obtaining information, many people are concerned that objectionable materials, especially sexually explicit materials, can be obtained too easily. Many parents are particularly concerned that their children can get access to such objectionable materials without supervision.

Congress recently passed the Communications Decency Act (CDA) to outlaw transmission of indecent material over the Internet. Many in the "Internet community" view the CDA as censorship, and have organized an online free speech campaign. Many also believe that parents should have the primary responsibility for controlling what their children obtain and view over the Internet.

## OBJECT AND SUMMARY OF THE INVENTION

It is an object of the present invention to provide a system that allows Internet users to filter material transmitted over the Internet.

According to an embodiment of the present invention, a client-based filtering system compares portions of incoming and/or outgoing messages with filtering information stored in a filter database, and determines whether to block or allow the incoming and/or outgoing transmissions of messages in response to the comparison. In response to a match between certain information in portions of the message and the filtering information, the system can employ one of a number of different specified blocking options, including discarding incoming data, preventing execution of an open command, or replacing parts of received data.

In a preferred embodiment, the system compares an interface port and an IP address to a stored list of ports and addresses. If a match is found, the system can allow the message to be transmitted or block the message prior to transmission. The system can defer the decision whether to allow or block, and then monitor transmissions to search for a particular command and a particular filter pattern. If a pattern is detected during an outgoing message to a host server, the system can block resulting incoming transmissions from that server. Thus, the system can check both IP addresses and strings in URLs.

The system preferably communicates with a remote update server that has new filtering information for updating the filter database. The system periodically accesses the update server over the Internet, and downloads one of a number of new sets of filters from the server to replace some or all of the existing filters.

The filter database and all implementation software preferably reside on the client computer system. Alternatively, a filtering database and implementing software can be stored on a server in a network to which the client is coupled, and can thus be incorporated into a firewall, gateway, or proxy server.

To implement this system, the present invention also includes methods for patching the operating system to take into account multitasking and variable-length instructions.

In Windows 95, in which a copy of certain library programs is made from disk into RAM for each application, the present invention uses patches to inject filtering code into RAM without modifying or replacing the library on the disk.

These patches cause a buffer to store a series of copied instructions from a called routine, where the buffer is between certain head processing routines and tail processing routines. Because the library is not replaced or modified, the system can adapt to upgrades or reloading without the concern of losing modified or alternate variations of programs.

With the present invention, a user can filter material received over the Internet that is personally objectionable, whether that material is sexually explicit, violent, politically extreme, or otherwise, depending on that user's individual tastes and sensitivities. By providing updates online, the system can adapt as new sites and servers are added to the Internet. Other features and advantages will become apparent from the following detailed description, drawings, and claims.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram of a network with a client computer for accessing the Internet.

FIG. 2 is a block diagram of a client computer system with a filtering system.

FIGS. 3 and 4 are flow charts illustrating filtering methods implemented by the filtering system.

FIGS. 5(a)-5(d) are charts illustrating known and new patching methods.

## DETAILED DESCRIPTION

A user uses a computer which serves as a client 10 to communicate with other computers over Internet 12. A number of clients are typically linked to a network 14, such as a local area network (LAN) or a broad-based commercial service. Many such networks are linked to one of a number of Internet providers 16, such as BBN, Inc. of Cambridge, Mass., which in turn, accesses the Internet.

Messages are transmitted over the Internet among computers with a transport protocol known as Transmission Control Protocol/Internet Protocol (TCP/IP). This protocol provides an error-free data connection between computers, and sits underneath and works in conjunction with higher level network protocols, including HyperText Transfer Protocol (HTTP); File Transfer Protocol (FTP); Network News Transmission Protocol (NNTP); Internet Relay Chat (IRC); and GOPHER.

According to the current Internet Protocol (version 4), each computer on or connected to the Internet has an IP address that identifies the location of the computer. Each IP address is a 32-bit number that is often written in the form n1.n2.n3.n4 (each nx represents an 8-bit number). (Version 6 of the Internet Protocol is expected to have 128-bit addresses, with one address for each interface, and with different types of addresses.) To initiate communications with another computer over the Internet, a computer opens a port in its interface for a TCP data stream. The computer sends messages that have defined fields for its own IP address and for the recipient computer's IP address.

With HTTP, a user can access web sites over the worldwide web using one of a number of commercially available web browsers, such as a Spyglass Mosaic web browser, available from Spyglass Inc. of Naperville, Illinois. To access a web site, the user enters a uniform resource locator



(URL) request with the form "http://www.name.ext", where "http://" indicates the protocol, and "www.name.ext" is a domain name (although currently "www" is often not required). Such a domain name with this form typically points to a home page. The domain name can also be followed by other file names or directories, with the directories separated from the domain name and from other directories with slashes that serve as spacer characters. The directories sit below the home page, but are individually addressable and accessible. URL requests are also made with the other protocols noted above, such as FTP and NNTP.

When a user enters a URL request, the client provides the URL to a domain name server (DNS) 18. DNS 18, which may be accessed through the Internet or directly from network 14, looks up the domain name and returns the IP address associated with that URL (if the name is in DNS 18). The client opens a TCP data stream and uses this IP address to communicate with the other computer.

Domain names in a URL are often descriptive. For many companies and other organizations, the domain name includes their own name, a close variation, or some acronym of their name. Other Internet service providers use names that are descriptive of some service that is provided or some interest that is addressed, e.g., "www.chess.com." While many descriptive names may be nonobjectionable, others such as "xxx" or "sex" may be included in a URL of a server that provides sexually explicit material that may be objectionable to some users. The string "sex" could, however, be part of some completely different name, such as "Essex" or "sextet."

While the domain name itself may not be objectionable, there may be objectionable certain files or directories below that domain name. For example, some commercial online services allow users to build personal home pages but do not restrict the material on that home page. Consequently, some but not all of the directories may be objectionable. It could be undesirable to eliminate all accesses to such a domain name if only a relative few directories under that domain name are objectionable.

Referring also to FIG. 2, in a first embodiment of the present invention, a filtering system resides in client computer 10. Processing by the filtering system is carried out by the computer's processor 20, and the system uses the computer's storage 22 to store a filter database 24. The filter database would typically be maintained in the client computer's hard drive, and could be copied to RAM during operation.

The client communicates with the Internet through an interface 26 that has a number of ports. By convention, certain default ports are associated with certain protocols; e.g., HTTP communications are typically transmitted through a port numbered 80. In the transmitted message, however, the user can specify another port that is different from the default port. Moreover, multiple ports can be used for one protocol, and one port could be used for multiple protocols. Thus, each TCP data stream passes through one of a group of numbered ports in interface 26. The client monitors these ports and maintains internal tables that indicate the state of each active TCP data stream, whether that stream is open or closed, for both incoming and outgoing transmissions.

The filter database has lists of filters, some of which are identified as either ALLOW filters or BLOCK filters for respectively allowing or blocking transmission. Both ALLOW and BLOCK filters in the database preferably have

fields for port number and IP address. These fields can include a specific port number, a specific IP address, and/or meta values ANY IP and ANY PORT, which stand for all possible IP addresses and all possible port numbers, respectively. Thus, a filter can apply to a specific port and a specific address; to a particular port regardless of the address by specifying the port and ANY IP; to a particular address regardless of the port by specifying the address and ANY PORT; or even any address in any port for complete blocking or as a catch-all default by indicating ANY IP and ANY PORT.

Each filter entry in the filter database also has a field for specifying an action to be taken by the client if that filter were retrieved. These actions are essentially divided into two groups, direct action or deferred action. Direct actions indicate that the system should unconditionally allow or unconditionally block the transmission. When filter entries are retrieved, they are first scanned for entries that require direct action; if there are any, these actions are carried out immediately. Deferred actions are discussed in more detail below.

When a message is transmitted, whether that message is incoming or outgoing with respect to the client computer, the filtering system compares the IP address and/or other information in the data stream to the filter entries stored in the database to determine whether some action needs to be taken. The filters are preferably stored so that the system searches ALLOW filters first, BLOCK filters next, and deferred action filters last, and takes action based on the first matched filter. In this order, ALLOW filters thus take precedence over BLOCK filters; accordingly, if a specific IP address/port is matched by both an ALLOW filter and a BLOCK filter, the ALLOW filter takes precedence. Alternatively, selected BLOCK filters or all BLOCK filters can be searched before the ALLOW filters to make sure that certain messages are blocked.

Referring to FIG. 3, the filtering system can filter outgoing messages on the basis of the IP address of the host server that is being contacted by the client. The filtering system detects when the client opens the data stream for a particular port and IP address (step 100), and searches the filter database for matching filters. The system first searches by port number to get the list of filters with IP addresses associated with meta value ANY PORT and also with the particular opened port (step 102). The system then checks for and retrieves any filters that match the particular IP address. The retrieved filters are checked to determine if any require immediate action, i.e., if unconditional allowing or blocking is required (steps 104, 106). If such action is required and it is to allow the transmission, the system allows the transmission to proceed normally (step 108). If the immediate action is to block the transmission, the system takes action to block the transmission (step 110), and provides a "Blocked" message to the user (step 112).

When blocking is done on the basis of the IP address of the outgoing message, such blocking is preferably accomplished by simply not executing the open command. This nonexecution causes a failure result to be returned to the application (e.g., web browser) that called the open command. The system also provides a screen on the user's display indicating that the transmission was blocked, and advising the user on how to get back to the state before the user tried to open the stream and send the message.

If, at step 104, it is determined that no immediate action must be taken, it is determined whether a deferred action must be taken with respect to any of the retrieved filter (step



116). If there is also no deferred action, the system can default to allow the transmission (step 108), or it can default to block the transmission (steps 110 and 112). Such defaults can be implemented with a last filter that includes entries ANY PORT and ANY IP, and an action that indicates allow or block. As noted above, prior conflicting filters would take precedence over this effective default in the last filter.

Deferred filter entries preferably have additional fields, including fields for (1) a keyword, typically a command such as GET; (2) a filter pattern to be compared to data in the message, typically a string of characters; (3) a directional indicator (IN/OUT) for indicating incoming or outgoing transmissions; (4) a compare directive for the type of match; and (5) an action to be taken, typically to allow or block the transmission. The compare directive indicates a type of match, e.g., whether the pattern must match with equality, whether it must appear in a particular substring, or whether it can appear with a wildcard character before, after, before and after, or embedded in the string.

Referring to FIG. 4, when data is transmitted over an open TCP/IP connection, the direction of the transmission is compared to the directional indicators in the deferred entities (step 130). For each entry in a filter that matches the direction, the beginning of the data stream is compared to the keyword in the filter entry (step 132). If the key-words match (step 134), the data is further compared to the filter pattern of the filter(s) according to the compare directive (step 136). If a match is found at this level (step 138), the specified action in the filter is taken (step 140).

The filters are preferably queued so that filter pattern matching is performed when incoming data is received from the host server following a particular detected outgoing command. With such queueing, a similar scan of the message is performed on the outgoing transmission, but blocking is performed on the incoming message. Blocking actions that are available for incoming messages are different from those for outgoing messages. The incoming data can be discarded, replaced by data from the database, or edited to remove occurrences of entries containing patterns stored in the database entry. Because modifications to incoming data can change the length of the data, because the filtering system has no way of knowing how much data will be received, and because edits by the filtering system may result in the data stream being broken across an edit, the filtering system preferably locally buffers incoming data with a local fragment buffer. The contents of the local fragment buffer may be edited to change or delete portions of the data in another part of the buffer or in storage used temporarily. The unedited portion may be returned to the fragment buffer so that the entire transaction will be transparent to the application requesting the data.

Specified parts of the protocol message can be corrupted, or portions of the response to a protocol message can be deleted. These approaches are most commonly used when access is requested by a news reader to a news group over NNTP (or by a request to a chat channel over IRC). When such a request is made, the server responds with a list of news groups that match the request. While many of the news groups may be nonobjectionable, it may be desirable to block some of the listed items. The system allows certain listed items in the response to an NNTP request to be blocked while allowing certain other strings. With these options, even though some items are allowed, a "Blocked" message should be provided on the user's screen to notify the user of the action taken.

The locations, names, and meanings of keywords and filter patterns in the URL vary with the particular protocol.

The system determines the particular protocol that is being used based on the port number as stored in the database. Thus the protocol is generally determined by the filters within the database, rather than by the filtering system software outside the database. When the system determines the protocol from the port, it then matches the specific URL (or group of URLs) based on locations in the URL where the commands are for that specific protocol. A pattern match is then performed on that part of the URL.

As an example of blocking an HTTP transmission, assume that the user requests "http://www.domain/test.html." The client transmits the URL request and the domain name server returns an IP address, e.g., 1.2.3.4, corresponding to the domain name. The client tries to open a TCP/IP connection with that IP address and typically with port 80. If that IP address and port 80 (or that IP address with ANY PORT) are together in a BLOCK filter, the system prevents the data stream from opening.

Rather than specifying blocking at this time, a filter can indicate a deferred action. In this example, the filter searches for a GET command as the keyword in an outgoing data stream, and for "test.html" as the filter pattern in the transmission. When the client sends a transmission with a GET command to get information under the directory test.html, the host server will respond with data for that directory. But if there is a blocking filter for test.html, the system can block the incoming data by discarding it or replacing it.

The filter pattern can specify particular strings for both allowing or for blocking. This can be useful when a potentially objectionable phrase may be part of an unrelated phrase. For example, the filters can cause the system to allow transmission of a directory with the string "sextet", while blocking transmission to or from a directory with the string "sex" by itself. By using wildcards (characters that stand for any non-alpha characters, such as "/" or "." before and/or after a particular phrase), particular appearances of "xxx" can be blocked, as it is less likely to be part of a nonobjectionable string; for example, if "★" indicates the wildcard, a filter pattern can be ★xxx★ indicates that any instances of xxx set off with periods, slashes, or other spacers within a URL will be matched by the filter.

While strings for filter entries may be searched sequentially, if there are many strings that need to be searched, the strings can be searched as a collection of strings organized by their beginning letter. In this case, the first character of each string is used as an offset into a table of starting positions in a string storage pool containing all of the strings to be searched. Strings within this pool are grouped by their beginning letter. The offset table contents for any letter contains the address within the pool of the first string beginning with that letter. This technique allows faster overall searching since only the strings that begin with the same letter need to be checked to determine a match. For more efficiency, a filter entry whose strings all begin with the same letter look for that letter specifically. If there is a match, then the remainder of the search is performed as described above, but beginning with the second character in the string being searched rather than the first.

Accordingly, when a match is found to a filter entry, whether the match is from an incoming message, outgoing message, an IP address, a phrase in a domain name, or a phrase somewhere else in the URL, the filter entry specifies one of a number of different actions with respect to different IP addresses and URLs. The filtering system can: (1) block access to a specific IP address, regardless of the port; (2) block access to a specific port, regardless of the IP address;



(3) block access to selected URL's on a specific port regardless of the IP address based on the content of the URL; e.g., prevent access to any web page containing the s letters "sex" or "xxx" in the URL; (4) block access to a URL or family of URLs at a specific IP address/port; (5) allow access to certain sites that would otherwise be blocked by the filter database; and (6) block access to all sites, and then allow access to specific sites, URLs, or families of URL's.

To implement option (6), for example, the system may have certain specified ALLOW filters, followed by a BLOCK filter for ANY PORT and ANY IP. The ALLOW filters would supersede later BLOCK filters, so the presumption is that what is not allowed is forbidden.

#### Updating Mechanism

Referring again to FIG. 1, when the system of the present invention is first loaded into a client system, it may have an initial set of filters for the filter database. Because Internet sites are being added to the Internet at a fast rate, however, the filtering system preferably also has an updating mechanism to keep the filters current. The updating mechanism in the filtering system can locate a particular HTTP or FTP update server 32 over the Internet. After optional user authentication, the updating mechanism causes the filtering system to download from the update server one of a number of new sets of filters, and preferably causes some or all of the existing filters in the filter database to be replaced with the newly downloaded filters.

When a user first installs the filtering system, the user is preferably provided with the authorization to make an initial download from the update server. This initial download addresses the potential problem of software aging on a store shelf. This download can supplement a filter database, or can be provided instead of an initial filter database. When the user updates with the initial download, the user is given an opportunity to obtain a subscription by filling out an on-screen subscription form to obtain further filter updates. Data from this form is transmitted and used to validate the user.

To obtain a download, the client identifies itself to the update server with a serial number. The server hashes the serial number into a value between 0 and 124 with a hashing function that provides a relatively uniform distribution of serial numbers over the range of numbers. The hash value is used to locate a file containing user data for serial numbers with that specific hash value. This data file is then downloaded into the client, and a search is conducted to find a matching entry in the client. If found, the entry contains subscription information, including expiration date, frequency of update, and identification of the filter set to be downloaded.

The update server can store and provide up to 65,536 different filter sets, each with a different group of materials to be filtered. The user data file indicates which set of filters is to be downloaded. Each set also includes additional information, including its creation date and version. If a download is made for a user who does not have an entry in the user database, the updater determines which set of filters to download.

The updating server sends email messages to a particular email address whenever a download or subscription occurs. These messages include date and time, the IP address of the user requesting the download, and the name and serial number of the user (if available). Alternatively, the updating mechanism can post information to a log file on a web server through a common gateway interface (CGI).

#### Editing Manager

In addition to an initial filter database and future updates, the filtering system has an editing Manager that allows the user to edit the database to add, delete, or modify filters in the database. The editing filter allows the user to make custom changes if the user believes that the filtering system is filtering too much or too little. The editing manager is preferably separately password protected. The system allows each filter to be examined individually.

The implementation and use of the editing manager are generally based on known database editing techniques. In addition, during a session over the Internet, a user can copy URLs for later editing. The user can then copy those URLs for inclusion in the database, or can edit the entry, e.g., to change the action from allow to block or vice versa.

#### Server-based System

Referring again to FIG. 1, according to another embodiment of the present invention, the filtering system can be provided from a server 30 that is on the client's own network 40. Such a topology may be more desirable, for example, in a corporate network that has a limited size and a uniform set of filters for many users. This version of the filtering system uses the same type of filter database as a client-based filtering system, but the filter database is located on server 30.

The server-based system preferably has several other 30 differences. Because a server environment may not have ready access to the Internet's domain name services, and because efficiency is important, an application produces its own domain name table for rapidly converting a domain name into a unique 32-bit number (typically an IP address). To make this conversion, the domain name is hashed, and the hash is used to locate a list of symbol table entities with matching hash values. This list is searched associatively for an entry which matches the domain name being looked up. If found, the entry contains the unique 32-bit value.

An algorithm for pattern matching as described above may not be efficient enough for a server environment, and therefore an alternative search technique is preferably employed. First, a large list of representative URLs are analyzed to determine the frequency of combinations of characters, preferably two characters at a time. The resulting frequency information is stored in a Diphthong Frequency Table (DFT) that associates character combinations and their frequency.

Next, each filter pattern for each filter entry is searched to determine the character combination that is the least frequent according to the DFT. The pattern and a signed integer offset are used to calculate the start of the pattern from the location of the character combination being matched. The character combination and the filter pattern are used to make an entry in a probe table. The probe table is indexed by the character combination, and the indexed entry points to a list of patterns are characterized by that combination. In other words, each filter pattern is analyzed to find a character combination, preferably a character pair, that is least likely to occur in a target URL. The filter pattern is then stored in the probe table according to that least likely character combination.

Pattern matching is then accomplished by comparing each specified character combination in the candidate string to the entries in the probe table. Since commonly used character combinations will normally produce no hits in the probe table, the number of full string comparisons which need to be made is minimized.



As an example, assume a user enters a string that includes a series of letters, and the character combinations of interest are character pairs. The system successively checks the probe table for each pair of characters in the string, and for each of these pairs, if a string on the list of filters has one of these pairs that is least common, the system performs a comparison of the entire strings. Because some of the character pairs in the string will be common, it will be unnecessary to make comparisons for these pairs. Thus, by searching according to least common character pairs, the number of comparisons is substantially reduced.

#### Patching Code

The filtering system provides patching code for the client computer's operating system. This code is different for a Windows-based system and for a Macintosh-based system.

For a Macintosh-based system, when a PBControl call is \*made, the parameters that are passed include a function selection variable that is compared to a bit vector containing values for all possible values of the function selector. If the bit vector has 0, no further filtering system code is executed, and the command is executed normally; if it is 1, the filtering system code is called before the normal command is executed. If the filtering system needs to take action after the normal execution of a command but before control is returned to the calling application, the stack of the application is modified so that when a return is made from the normal execution of the code, control goes to the filtering system patching code, and then returns to the application normally so that the application is not aware that the filtering system has been called.

In some cases, a command may be executed asynchronously. So far as the application is concerned, the call returns and sometime later a completion routine is executed. In this case, the filtering system creates a dummy piece of code that gets executed at completion time, and then correspondingly executes the application's completion routine in a manner that makes the presence of the filtering system undetectable, except for any blocking action that might be taken.

Referring to FIG. 5(a), in a typical system without patching, an application 40, such as a web browser, has call instructions 41. A routine 42 has an entry point 44, a series of instructions 46, and a return 48 to the next instruction 50 after the call. Application 40 calls the routine, instructions 44-48 are executed, and control returns to the application.

Referring to FIG. 5(b), under Windows 3.1 and 16-bit subsystems of Windows 95 (generally referred to as Win16), a Winsock API is patched by identifying all relevant entry points 54 and replacing them with a jump instructions to patch code 56, identified here as "filtering." Patch code 56 implements all head processing 60 which must take place before calling the application's call 58. Such head processing can include matching a port and a URL or IP address to filters in the database. The entry point of the instruction is reset to its original state in instruction 62 and the patch code has a call 64 to the patched routine 66 as a subroutine. After instructions 68, patched routine 66 has a return 70 to patch code 56. Patch code 56 has instructions 72 to re-replace entry 54 with a jump to the filtering patch code instructions 74 to perform tail processing (such as further filtering actions or blocking actions), and a return 76 to a next instruction 78 in the application. These patches are referred to here as soft patches and are generally known.

These soft patches can, however, have drawbacks with some operating systems, including Windows 95. Because the instructions have variable length, the initial replacement

of the entry point in the originally called routine 66 may include only part of the first instruction or may include the first instruction and part of a second. Moreover, with a multitasking operating system, there is a period of time between instructions 62 and 72 when entry point 54 does not have a jump. Consequently, the filtering system could lose control during this time if another application calls that routine.

Referring to FIG. 5(c), to address these matters, other patches, referred to here as hard patches, are put in place. A hard patch to a routine 80 is achieved by copying to a buffer 82 the first several instructions 84 beginning with the entry point of routine 80. To determine which instructions are copied, instructions 84 are identified and selected so that the copied instructions have a minimum total length in bytes and an even number of bytes. These instructions are then modified if needed to operate in the buffer. Entry point 84 of routine 80 is replaced with a jump instruction to a head processing routine 86. After the head processing is a jump instruction 88 to buffer 82. Instructions 84 are executed and then routine 80 is modified so its return 90 points to tail processing 92. Next, an instruction 94 is added at the end of private buffer 82 to jump back into patched routine 80 a next instruction 96 after the jump. After return 90, processing returns to tail processing routine 92, which returns to the calling application that is unaware the filtering system has been called.

Such hard patches are generally used to patch when applications are created or loaded. These include the LoadModule system calls for Win16; and CreateProcess, LoadLibrary, and GetProcAddress in 32-bit portions of Windows (referred to generally as Win32), such as Windows 95.

Referring to FIG. 5(d), to patch the Winsock API with Win32, an application's dll import table 200 is patched to replace Winsock calls with filtering system calls 202. These calls point to head processing 204. Next, a call 206 points to entry 208 of the original Winsock routine 210. After a return 212, the system performs tail processing 214 as necessary. Control then is returned to the application.

To inject patching code into the address space of a Winsock client without the need to modify or alter the library stored on disk, the following method is used: (1) during head processing of the CreateProcess call, the arguments are modified to create the process in an initially suspended state; (2) during tail processing of the CreateProcess call, the modules loaded into the address space of the new process are examined, and if WSOCK32 has been loaded, the patching code is injected; (3) to activate the injecting code, the original entry point of the process on the stack is pushed to act as a call return address and the initial instruction pointer at a routine that loads filtering system code into memory and patches the applications import table is pointed to the routines of the filtering system; (4) if during tail processing of the LoadLibrary routine, WSOCK32 has been loaded by an application which is dynamically linking to Winsock (or a loaded library is implicitly linked to WSOCK32), a loading/patching routine is called; and (5) if an application dynamically links to WSOCK32 using the above LoadLibrary method, all calls to GetProcAddress are identified and the address of filtering system routines are returned to gain control of the API.

A Windows 3.1 application is installed to a publicly known directory with redundant duplicate hidden files in the DOS and Windows directories. To activate the filtering system, which is implemented as a monolithic executable



program containing both the control panel and the blocking code, an item is added to the Startup menu, and a line is added to the WIN.INI file. Additionally, the file system.drv is replaced with a new system.drv that loads the original system.drv and aliases all of its entry points to point to the original routines. Additionally a "soft" hook is placed on a WinExec call so that the first time this routine is called, the filtering system is run and WinExec is unhooked.

These measures are also taken on Windows 95. Additionally, the control code and the blocking code are separated so that the control panel loads the blocking routines and provides on/off functionality, while the system.drv hook loads both 16-bit blocking library routines and 32-bit library routines. To activate the filtering system, a reference to the executable program is added to the "Run-Services" registry key so that the operating system automatically executes the program on startup.

Once the filtering system library routine is loaded, it cannot be unloaded. Therefore, if a user kills the program by re-booting, the blocking mechanisms are left intact.

Having described preferred embodiments of the present invention, it should be apparent that other modifications can be made without departing from the scope of the invention as set forth in the appended claims. For example, the present invention can be readily adapted to new protocols, or updated versions of other protocols, such as new versions of the Internet Protocol.

What is claimed is:

1. A method for communicating with servers over the Internet to prevent or allow access to Internet sites, the method comprising computer-implemented steps of:

- (a) opening a data stream to send a message through an interface to an Internet server;
- (b) maintaining a database of filtering information comprising a table of filters, said table comprising
  - (1) filters specifying immediate action, and
  - (2) filters specifying deferred action;
- (c) comparing information in the message to filtering information in at least one of said filters specifying immediate action and said filters specifying deferred action; and
- (d) determining whether to prevent or allow the outgoing transmission of the message based on the comparison.

2. The method of claim 1, wherein some of the filters indicate that the message should be sent, and others indicate that the message should be blocked.

3. The method of claim 1, wherein in step (b) the filters specifying immediate action comprise fields specifying an interface port, an Internet Protocol (IP) address, and an action to be taken if the filtering information matches the information in the message.

4. The method of claim 3, wherein step (c) includes comparing an Internet Protocol (IP) address of the message to the filtering information.

5. The method of claim 1, wherein in step (b) the filters specifying deferred action comprise fields specifying a keyword, a filter pattern, a compare directive, and an action to be taken if the filtering information matches information in the message.

6. The method of claim 5, wherein the message includes a URL, and step (c) includes comparing a domain name in the URL to filtering information in at least one of said filters specifying immediate action and said filters specifying deferred action.

7. The method of claim 6, wherein step (c) includes comparing file information in the URL to the filtering information.

8. The method of claim 5, wherein step (c) includes comparing a command after a connection has been opened to filtering information in at least one of said filters specifying immediate action and said filters specifying deferred action.

9. The method of claim 1, wherein steps (a)-(d) are all performed by a client computer, step (b) including maintaining the database in storage residing on the client computer.

10. The method of claim 5, wherein step (c) includes comparing strings in the message against strings in at least one of said filters specifying immediate action and said filters specifying deferred action, the strings in the filter database being maintained based on the least common string in the filter entry.

11. The method of claim 9, further comprising a step of updating the database by downloading new filtering information from an update server, the update server being accessible to the client computer over the Internet.

12. The method of claim 11, wherein the updating step includes replacing at least some of the information previously stored in the database.

13. The method of claim 5, wherein the message includes a URL, wherein step (c) includes comparing a command in the URL to at least one of said filters specifying immediate action and said filters specifying deferred action.

14. The method of claim 6, wherein step (c) include comparing directory information in the URL to the filtering information.

15. A method for filtering messages transmitted over the Internet to prevent or allow access to Internet sites, the method comprising computer-implemented steps of:

- (a) maintaining a database of filtering information comprising a table of filters, said table comprising
  - (1) filters specifying immediate action, and
  - (2) filters specifying deferred action;
- (b) comparing information in the message to filtering information in at least one of said filters specifying immediate action and said filters specifying deferred action; and
- (c) determining whether to prevent or allow transmission of the message in response to the comparison.

16. The method of claim 15, further comprising a step (d) of updating the filtering information by downloading from a remote server via the Internet new filter information for storage in the database of filter information.

17. The method of claim 16, wherein step (d) includes replacing the existing filter information with the new filter information.

18. The method of claim 16, wherein the update server has a number of sets of new filter information, the method further including a step of providing to the server a message indicating which set of filters to download.

19. A method for communicating with servers over the Internet to prevent or allow access to Internet sites, the method comprising the computer implemented steps of:

- (a) sending messages to and receiving messages from an Internet server through an interface;
- (b) maintaining a database of filtering information comprising a table of filters, said table comprising
  - (1) filters specifying immediate action, and
  - (2) filters specifying deferred action;
- (c) comparing information in the messages to filtering information in at least one of said filters specifying immediate action and said filters specifying deferred action; and



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(d) determining whether to prevent or allow transmission of the messages based on the comparison; wherein steps (a)–(d) are performed by a client computer connected to the Internet through a network server.

20. The method of claim 19, wherein step (d) comprises a determination to prevent transmission of the messages, the method further comprising steps of buffering the messages in a buffer, discarding at least part of the incoming messages, and displaying a message indicating that the transmission was prevented.

21. The method of claim 18, wherein in step (b) the filters specifying deferred action comprise fields specifying a keyword, a filter pattern, and an action to be taken if the filtering information matches information in the messages.

22. The method of claim 19, step (c) including comparing messages sent to the Internet, the method further comprising the step of queuing the filtering information.

23. A method for communicating with servers over the Internet to prevent or allow access to Internet sites, the method comprising the computer-implemented steps of:

- (a) opening a data stream to receive a message through an interface from an Internet server;
- (b) maintaining a database of filtering information comprising a table of filters, said table comprising
- (c) filters specifying immediate action, and
- (d) filters specifying deferred action;

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(e) comparing information in the message to filtering information in the filters specifying immediate action and filters specifying deferred action and

(f) determining whether to prevent or allow the incoming transmission of the message based on the comparison.

24. A method of executing a hard patch for a called computer routine comprising the computer-implemented steps of:

- (a) identifying instructions and copying a number of instructions with a minimum number of bytes from an entry point of a called routine to a buffer;
- (b) providing an application calling the called routine;
- (c) jumping from the called routine to a head processing routine;
- (d) performing the head processing routine;
- (e) jumping to the buffer;
- (f) executing the copied instructions;
- (g) returning to the called routine after the jump of step (c);
- (h) returning to a tail processing routine;
- (i) performing the tail processing routine; and
- (j) returning to the calling application.

\* \* \* \* \*