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Ji et al.

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[54] VIRUS DETECTION AND REMOVAL APPARATUS FOR COMPUTER NETWORKS

6350784 6/1994 Japan H04N 1/00
9322723 11/1993 WIPO G06F 11/00

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[57] ABSTRACT

[21] Appl. No.: 533,706

A system for detecting and eliminating viruses on a computer network includes a File Transfer Protocol (FTP) proxy server, for controlling the transfer of files and a Simple Mail Transfer Protocol (SMTP) proxy server for controlling the transfer of mail messages through the system. The FTP proxy server and SMTP proxy server run concurrently with the normal operation of the system and operate in a manner such that viruses transmitted to or from the network in files and messages are detected before transfer into or from the system. The FTP proxy server and SMTP proxy server scan all incoming and outgoing files and messages, respectively before transfer for viruses and then transfer the files and messages, only if they do not contain any viruses. A method for processing a file before transmission into or from the network includes the steps of: receiving the data transfer command and file name; transferring the file to a system node; performing virus detection on the file; determining whether the file contains any viruses; transferring the file from the system to a recipient node if the file does not contain a virus; and deleting the file if the file contains a virus.

[22] Filed: Sep. 26, 1995

[51] Int. Cl. 6 G06F 11/34

[52] U.S. Cl. 395/187.01; 364/286.4; 364/DIG. 1

[58] Field of Search 395/186, 187.1, 395/200.06; 380/4; 364/285.1, 286.4

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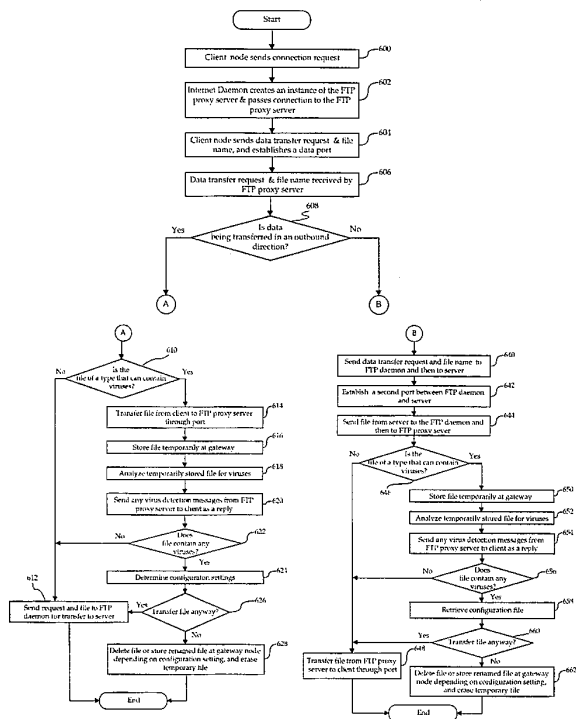
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22 Claims, 12 Drawing Sheets



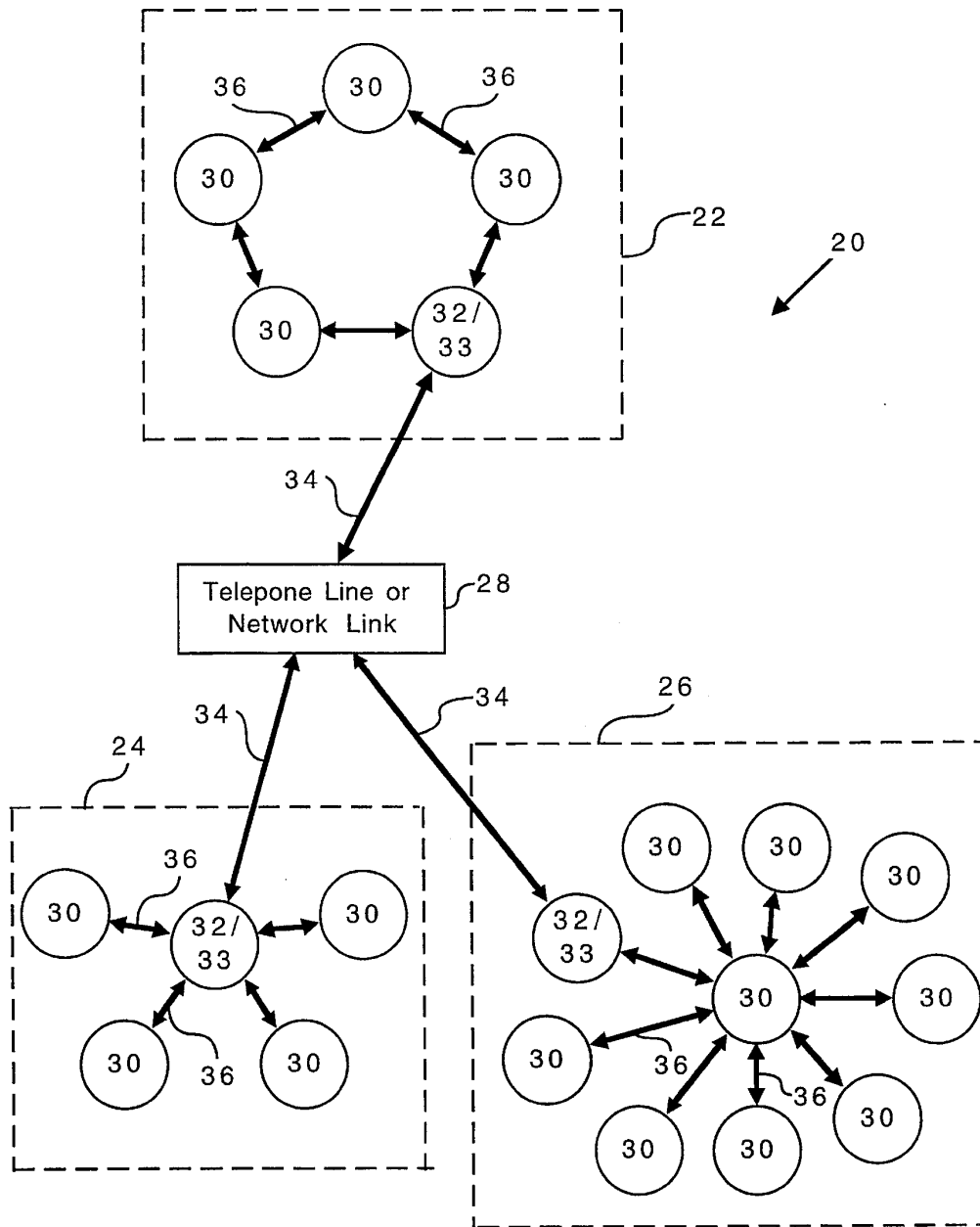


Fig. 1 (Prior Art)

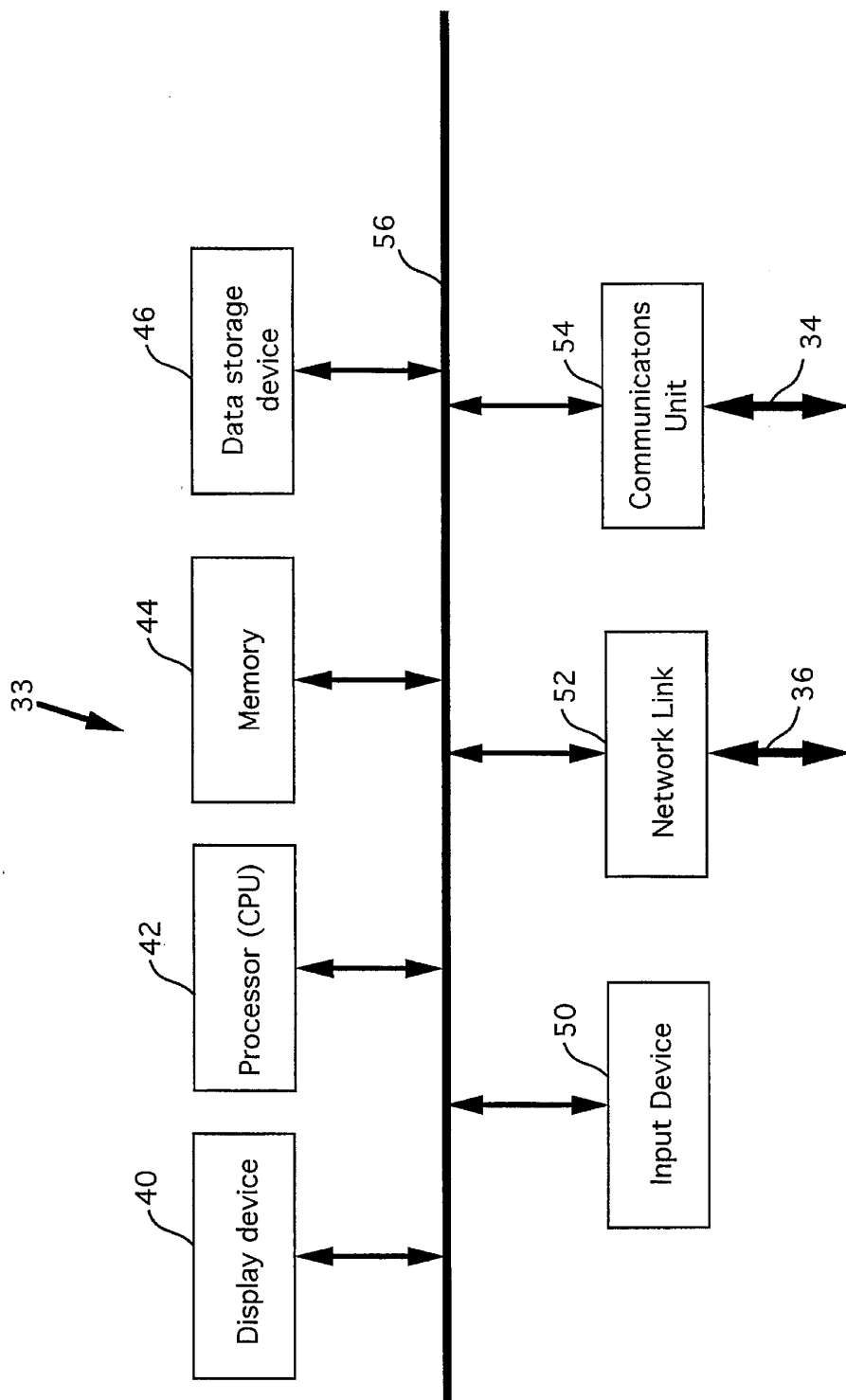


Fig. 2

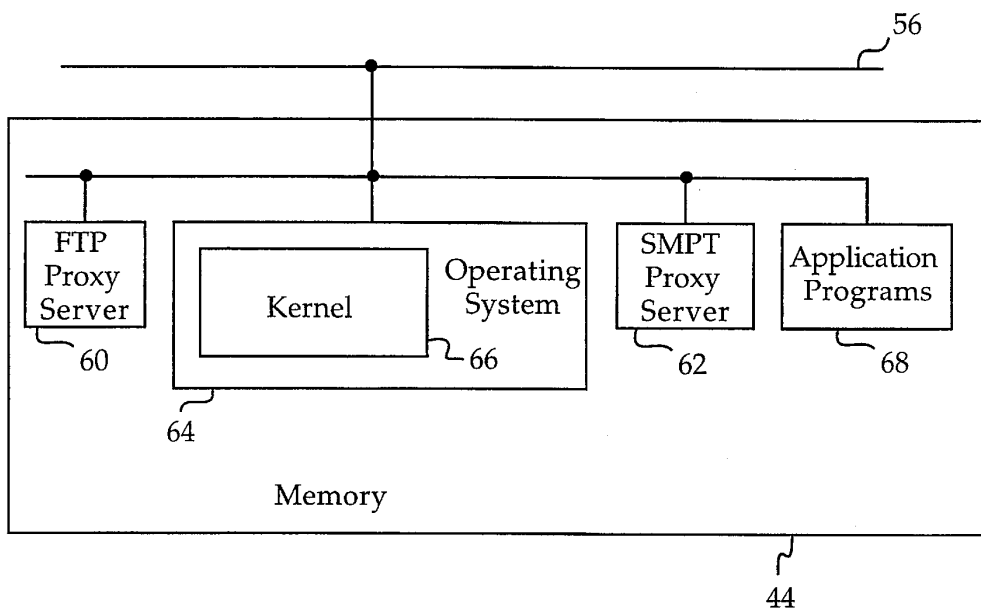


FIG. 3

| OSI Layer | Protocol Implementation | | | |
|---------------------|---|---|---|--|
| 406 Application | 423 File Transfer | 424 Electronic Mail | 425 Terminal Emulation | 426 Network Management |
| | 421 FTP Proxy Server | 422 SMTP Proxy server | | |
| 405 Presentation | 417 File Transfer Protocol (FTP) | 418 Simple Mail Transfer Protocol (SMTP) | 419 TELNET Protocol | 420 Simple Network Management Protocol (SNMP) |
| 404 Session | | | | |
| 403 Transport | 415 Transmission Control Protocol (TCP) | | 416 User Datagram Protocol (UDP) | |
| 402 Network | 412 Address Resolution | 413 Internet Protocol (IP) | 414 Internet Control Message Protocol (ICMP) | |
| 401 Data Link | 411 Network Interface Cards: Ethernet, StarLAN token Ring | | | |
| 400 Physical | 410 Transmission media: twisted pair, coax or Fiber Optics | | | |

FIG. 4

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