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Ji et al.

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[54] **VIRUS DETECTION AND REMOVAL APPARATUS FOR COMPUTER NETWORKS**

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[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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[57] **ABSTRACT**

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 Claims, 12 Drawing Sheets
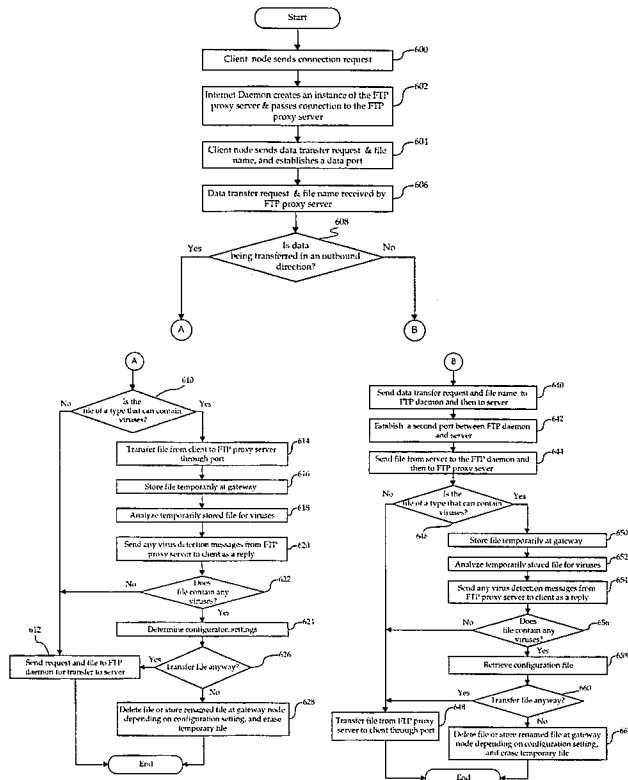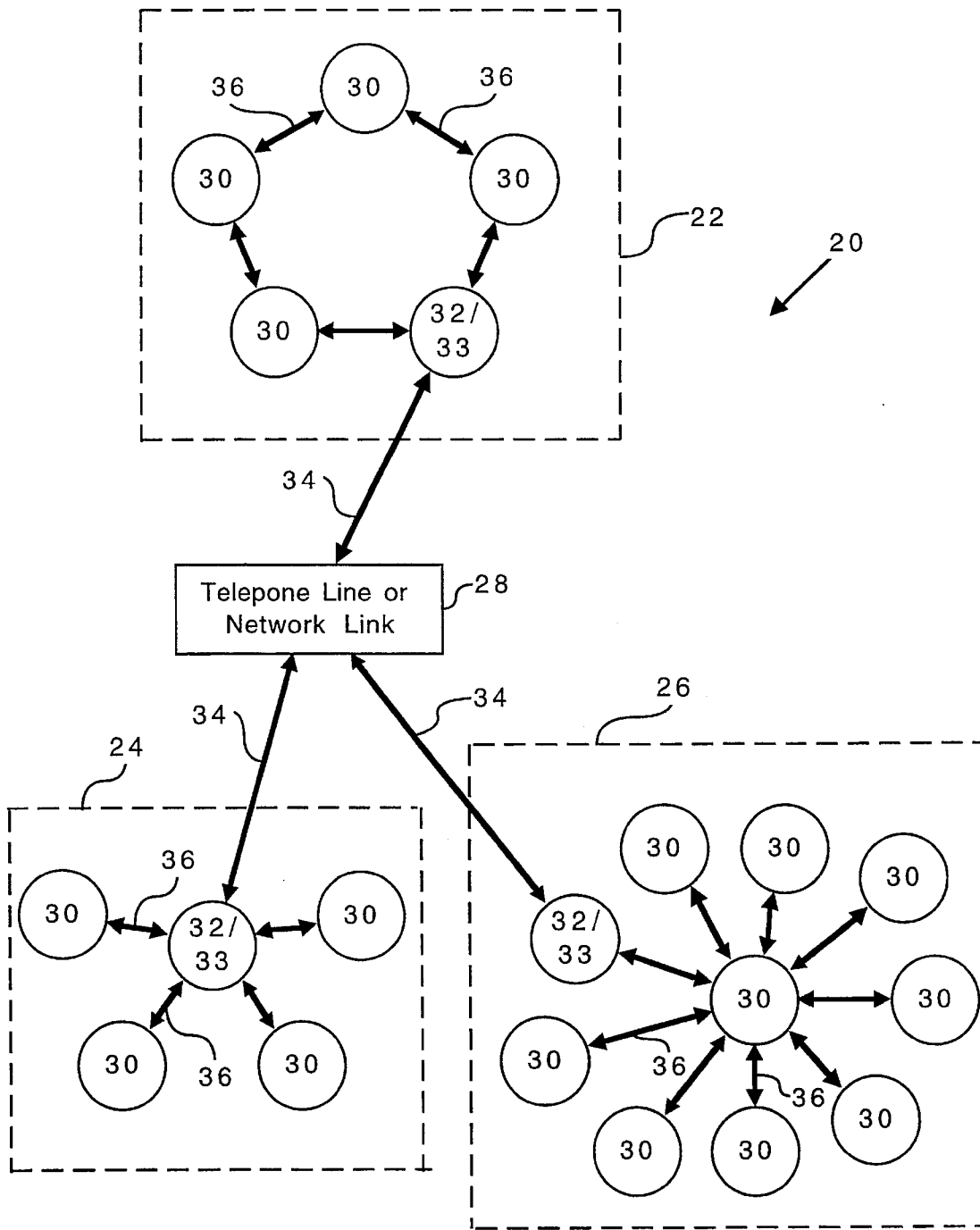
Fig. 1 (Prior Art)
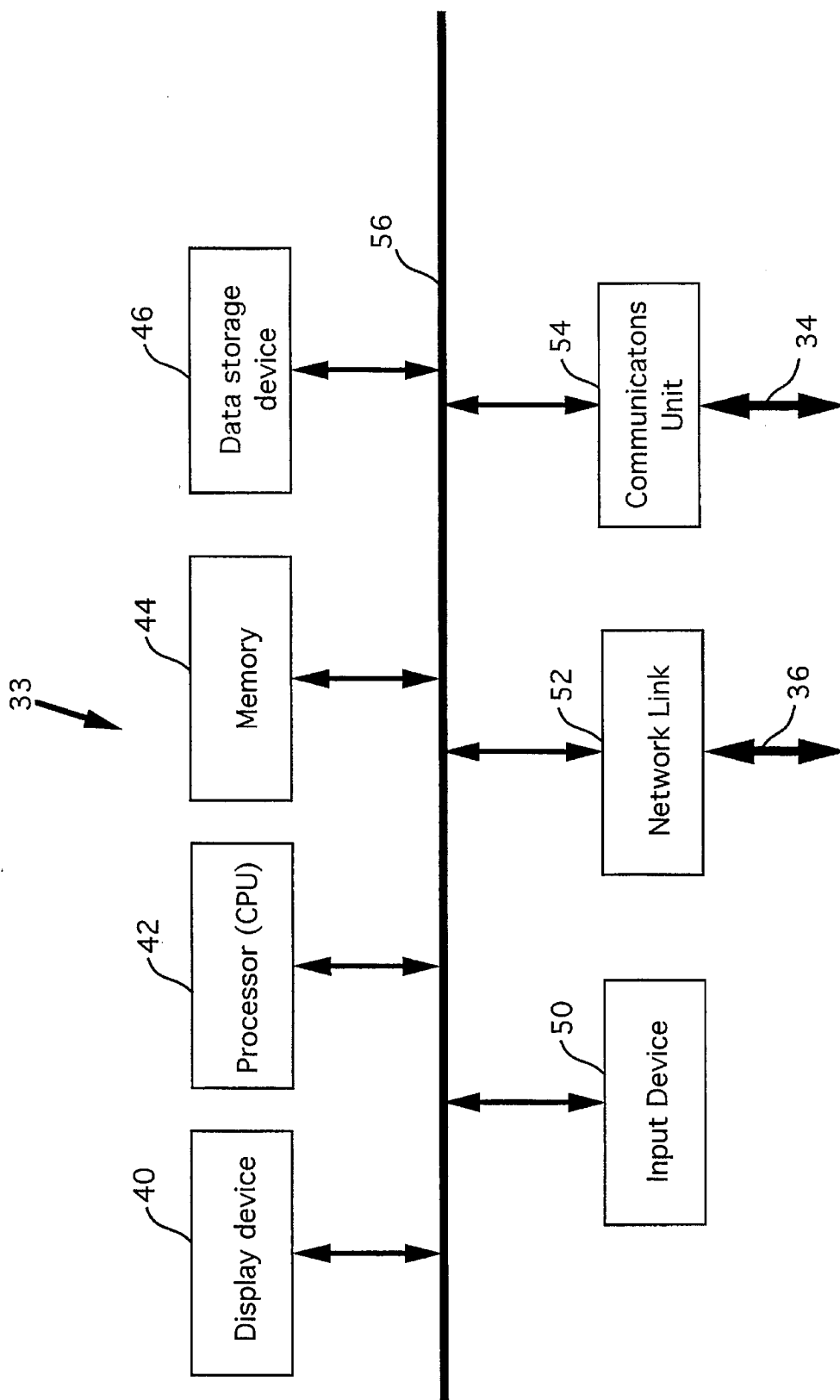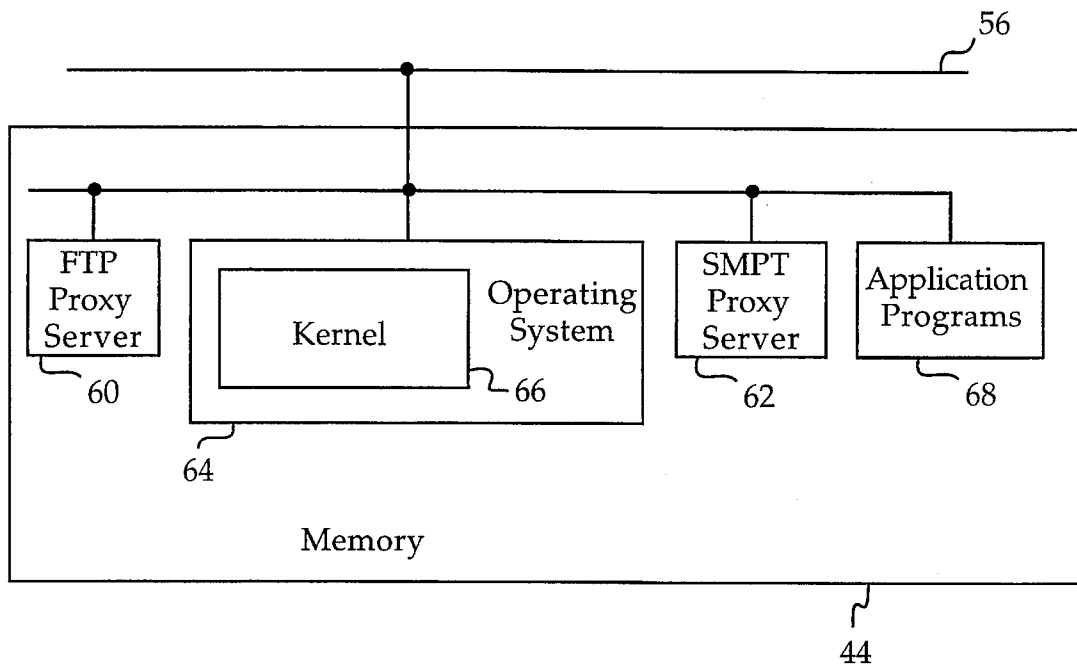
Fig. 2

FIG. 3

OSI Layer   Protocol   Implementation

406 Application	423 File Tranfer	424 Electronic Mail	425 Terminal Emulation	426 Network Management
	421 FTP Proxy Server	422 SMTP Proxy server		

405 Presentation	417 File Tranfer Protocol (FTP)	418 Simple Mail Tranfer 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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