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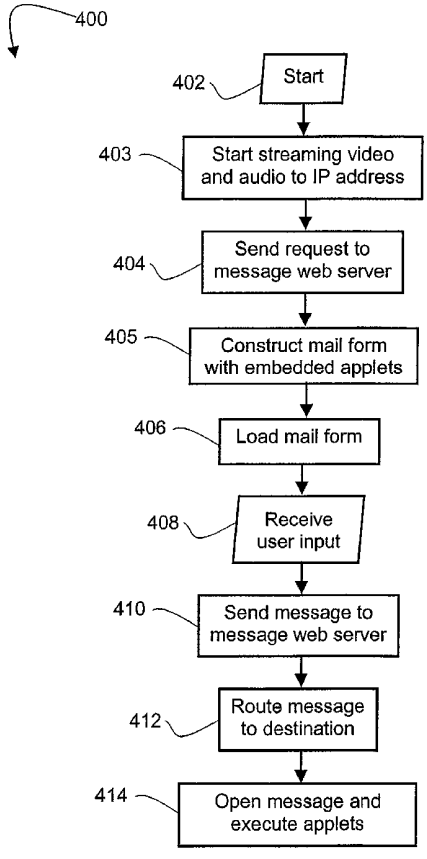
(54) Title: NON-RECORDED AUDIO/VIDEO STREAM TRANSMISSION USING ELECTRONIC MAIL



(57) Abstract: A method (400) of transmitting a digital data stream an electronic network (120) is disclosed. The digital data stream includes at least one of audio, video, and audio-video data and is streamed from an initiating computer (305) to the electronic network (120). An e-mail message is then transmitted from the initiating computer (305) to a destination computer (310), with the e-mail message including an application with an address of the streaming digital data. Upon receipt of the message by the destination computer (310), the application is activated, and the digital data stream is received using the application dependent upon the address.

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NON-RECORDED AUDIO/VIDEO STREAM TRANSMISSION USING ELECTRONIC MAIL

Technical Field of the Invention

The present invention relates generally to sending messages over a computer network and, in particular, to sending messages containing live video and audio streams over the computer network.

Background

Collaboration between and among individuals who are separated by distance is an integral part of our society, whether the collaboration is for personal or business purposes. Telephones have partially satisfied this need, but have a number of limitations. Such limitations include cost and the fact that audio communication only is prohibitive.

Conventional electronic mail (e-mail) provides a cost-effective means for communication to other parties anywhere in the world, but is often less personal than a telephone conversation. It is generally accepted that conventional e-mail messages and even telephone conversations lack the "personal touch" associated with face-to-face communication, as communication often involves more that mere exchange of words. Both e-mail messages and telephone conversations are totally incapable of communicating visual cues, gestures, etc.

Existing e-mail allows audio and video clips to be sent with a message to enhance communication. Such audio and video clips are typically compiled by the sender, stored on a storage medium of the computer of the sender, and then added as attachments to a message before sending the message. The message including the

attachments, which is typically very large in the case of audio and video clips, is then transferred to and stored on respective servers of each of the recipients. Each recipient may then open their received message and view any attachments if the recipient so desires. The message including the attachments remains on the respective servers until the respective recipients delete those messages. Accordingly, a large amount of storage is associated with this manner of communication. Due to storage restrictions, certain servers may even block messages with large attachments and may only allow for transmission of text messages.

Traditional videoconferencing in turn satisfies the face-to-face aspect of the communication, but is prohibitive due to its cost and availability. Such videoconferencing is often only available in conference centers.

Thus, a need clearly exists for an improved method and system of transmitting audio and/or video streams to substantially overcome, or at least ameliorate, one or more disadvantages of existing arrangements.

Summary

According to a first aspect of the invention, there is provided a method of transmitting a digital data stream including at least one of audio, video, and audio-video data via an electronic network, said method comprising the steps of:

streaming first digital data from a source to said electronic network;

transmitting a first e-mail message from said source to at least one destination, said first e-mail message including a first application with a first address of said first digital data;

activating said first application at said destination(s); and

receiving said first digital data stream at said destination(s) using said first application dependent upon said first address.

Other aspects of the invention are also disclosed.

Brief Description of the Drawings

One or more embodiments of the present invention will now be described with reference to the drawings, in which:

Fig. 1 is schematic block diagram of a computer network system including a plurality of general-purpose computer systems;

Fig. 2 is a more detailed schematic block diagram of one of the general purpose computer illustrated in Fig. 1;

Fig. 3 shows a schematic block diagram of a simplified computer network system of that shown in Fig. 1;

Fig. 4 shows a method of sending a "live" electronic-mail message from a initiating computer to a destination computer; and

Figs. 5A to 5D illustrate schematic block diagrams of the initiating computer, the destination computer and the effective data flow between those computers for a number of implementations.

Detailed Description including Best Mode

Where reference is made in any one or more of the accompanying drawings to steps and/or features, which have the same reference numerals, those steps and/or features have for the purposes of this description the same function(s) or operation(s), unless the contrary intention appears.

Fig. 1 is schematic block diagram of a computer network system 10. As shown, each of a plurality of general purpose personal computers (PC's) (hereinafter referred to as "computers") 100-1 to 100-m_1 connects, via lines 12-1 to 12-m_1 respectively, to a plurality of Local Area Networks (LAN's) 14-1 to 14-n. Each LAN 14-1 to 14-n typically extends over a distance from a few hundred meters to a few kilometres, and is usually located within a building or a group of proximate buildings. Each LAN 14-1 to 14-n is also connected through a proxy server (not illustrated) to the World Wide Web (WWW) 150 via connections 18-1 to 18-n respectively.

Further computers 100-m_2 to 100-m_3 are also provided which connect directly to the WWW 150 via connections 20-m_2 to 20-m_3 respectively, typically through a "dial-up" connection to an Internet Service Provider (ISP) (not illustrated). The computer network system 10 also includes a message web server 50 connected to the WWW 150. Although only six computers 10 are illustrated in Fig. 1, it will be understood that many more could be provided.

Fig. 2 is a more detailed schematic block diagram of one of the computers 100. The computer 100 comprises a computer module 101, input devices such as a keyboard 102, a mouse 103, a digital camera 119 and a microphone 117, and output devices including a display device 115 and loudspeakers 118. A Modulator-Demodulator (Modem) transceiver device 116 is used by the computer module 101 for communicating to and from a communications network 120 connectable via a telephone line 121 or other functional medium. The communications network 120 may be the WWW 150 (Fig. 1) or LAN 14 (Fig. 1).

The computer module 101 typically includes at least one processor unit 105, a memory unit 106, for example formed from semiconductor random access memory (RAM) and read only memory (ROM), input/output (I/O) interfaces including a video

interface 107, and an I/O interface 113 for the keyboard 102 and mouse 103, an I/O interface 114 for the microphone 117, the loudspeakers 118 and the digital camera 119, and an interface 108 for the modem 116. A storage device 109 is provided and typically includes a hard disk drive 110 and a floppy disk drive 111. A CD-ROM drive 112 is typically provided as a non-volatile source of data. The components 105 to 114 of the computer module 101, typically communicate via an interconnected bus 104 and in a manner which results in a conventional mode of operation of the computer 100 known to those in the relevant art.

Fig. 3 shows a schematic block diagram of a simplified computer network system 300 of that shown in Fig. 1. In the simplified computer network system 300, each of an initiating computer 305, a destination computer 310 and the message web server 50 are connected to the communication network 120, with intermediate data paths, such as LANs 14 where applicable, not illustrated. The initiating and destination computers each represent one of the computers 100 illustrated in Figs. 1 and 2. The initiating computer 305, destination computer 310 and the message web server 50 are configured to communicate with each other over the communication network 120 using HyperText Transfer Protocol (HTTP) in a manner known to those skilled in the relevant art.

Fig. 4 shows a method 400 for sending a "live" electronic mail (e-mail) message from the initiating computer 305 to the destination computer 310. The method 400 starts in step 402 when the user of the initiating computer 305 initiates a "live e-mail" application, typically resident on the hard disk drive 110, and read and controlled in its execution by the processor 105 of the initiating computer 305. The live e-mail application may be stored on any computer readable medium. The term "computer readable medium" as used herein refers to any storage or transmission

medium that participates in providing instructions and/or data to the computer 100 for execution and/or processing. Examples of storage media include floppy disks, magnetic tape, CD-ROM, a hard disk drive, a ROM or integrated circuit, a magneto-optical disk, or a computer readable card such as a PCMCIA card and the like, whether or not such devices are internal or external of the computer module 101. Examples of transmission media include radio or infra-red transmission channels as well as a network connection to another computer or networked device, and the Internet or Intranets including email transmissions and information recorded on websites and the like.

The initiating computer 305, under control of the "live e-mail" application, emulates in step 403 a web server and streams video captured on the digital camera 119 and audio captured on the microphone 117 to the communication network 120. In particular, the video and audio are streamed to the Internet Protocol (IP) address allocated to the initiating computer 305 for a current Internet session.

In step 404 the initiating computer 305, also under control of the "live e-mail" application, executes a web browser application, stored on the hard disk drive 110 of the initiating computer 305. The web browser application is also controlled by the live e-mail application to send a request to the message web server 50. The request includes dynamic parameters including the allocated IP address of the initiating computer 305, a port address allocated for the video stream, user configurable video dimensions and frame rate, a password and an expiration time. The password provides security in that only requests to that IP address which includes the password can received the streaming data. The request further includes an e-mail address and a username of the user of the initiating computer 305.

On receipt of the request from the initiating computer 305 by the message web server 50, the message web server 50 constructs in step 405 an audio applet and a video applet using the dynamic parameters included in the request. The expiration time allows the applets to only access the IP address up to the expiration time. The audio and video applets are then embedded into a mail form that is also constructed by the message web server 50. The mail form is a HyperText Mark-up Language (HTML) document which, when rendered by the web browser application of the initiating computer 305, provides a number of fields to be filled in by the user of the initiating computer 305. The message web server 50 uses the e-mail address and username of the user of the initiating computer 305 received in step 404 to enter that information into the appropriate fields.

In step 406 the mail form is loaded into the web browser application of the initiating computer 305 from the message web server 50 and rendered on the display 115 of the initiating computer. The advantage of retrieving the mail form from the message web server 50, rather than for the "live e-mail" application to construct the mail form and applets at the initiating computer, is that the provider of the message web server 50 retains control over the process. It also allows the provider to alter the appearance of the mail form periodically, for example by incorporating banner ads onto the mail form.

The mail form includes a field for an e-mail address of a user of the destination computer 310. Preferably the form further includes fields for entering e-mail addresses for sending courtesy copies to other users and a field for entering a text message.

In step 408 the initiating computer 305 receives data entered by the user into those fields. Hence, the user of the initiating computer 305 does not use a normal e-

mail client such as Outlook™ Express (product from Microsoft Corporation) to compose the e-mail message, but rather uses the mail form rendered by the web browser application to compose the message. This removes the need for an HTML compatible e-mail client, which is needed for rendering rich graphical content and for including embedded applets. The input step 408 ends when the user of the initiating computer 305 initiates the sending of the message. This is preferably done by depressing a "send button" on the form using the mouse 103.

The method 400 then continues to step 410 where the mail form, which includes the data received in step 408 and the applets, is sent to the message web server 50. The message server 50 in step 412 forms an e-mail message from and routes the message to the server (not illustrated) of the destination computer 310, from where the user of the destination computer 310 is alerted to the presence of an e-mail message, typically by some audio indication that e-mail is available. Often subject and sender fields are also displayed.

When the destination computer 310 receives a command from its user to open the message in step 414, typically by pointing to and depressing a "open button" on its e-mail client with the mouse 103, the contents of the message is uploaded to the destination computer 310. Upon opening of the message, the video and audio applets are executed by the e-mail client of the destination computer 310. The video and audio applets first confirm the validity of the password contained therein and provide an error message if determined not to be valid. The video applet uses the dynamic parameters contained therein to provides a video window having the specified video dimensions and frame rate, and accesses the initiating computer's IP address and port address to receive the streaming video data from that IP address. In particular and referring to Fig. 5A which is a schematic block diagram 500 of the initiating computer

305, the destination computer 310 and the effective data flow between those computers 305 and 310, a video module 505 of the live e-mail application 502 on the initiating computer 305 forms video data from data received from the digital camera 119a and streams the video data to the IP address and allocated port of the initiating computer 305. The video applet 510 executing on the destination computer 310 receives the video data and displays the video data on the display 115b of the destination computer 310. Also, an audio module 515 of the live e-mail application 502 on the initiating computer 305 forms audio data from a signal received from the microphone 117a and streams the audio data to the IP address of the initiating computer 305. The audio applet 520 accesses the initiating computer's IP address to receive the streaming audio data and outputs the audio data through the speakers 118b of the destination computer 310.

The user of the destination computer 310 may thus view and listen to a streaming video and audio message from the user of the initiating computer 305. The video and audio applets destruct upon closure of the message. The expiration time contained in the applets ensures that the user of the destination computer 310 cannot at a later time execute the applets again, thereby preventing the user to view and listen to streaming video and audio streamed on that IP address at a later time, which may be intended for another recipient.

In the event that the server of the destination computer 310 employs a firewall to block the applets, the user of the destination computer 310 presses a "no video click here" button provided on the message. This in turn launches a web browser stored on the storage device 109 of the destination computer 310 with a request to the IP address of the initiating computer 305. Accordingly, the web browser displays the exact same message and content, which includes the streaming video and audio.

Referring to Fig. 5B where a schematic block diagram of a further implementation is shown, a talk back applet 530 is also constructed and embedded into the mail form in step 405. A "talk back button" is also provided in the message on the display 115b of the destination computer 310. When the user of the destination computer 310 depresses the talk back button, the talk back applet 530 is executed. The talk back applet 530 connects an audio stream received from the microphone 117b of the destination computer 310 back to the initiating computer 305, which emulates a server, to provide audio output over the loudspeaker 118a of the initiating computer 305.

As would be understood by a person skilled in the art, the implementation illustrated in Fig. 5B may also be used without a video applet 510, allowing a two-way voice communication between users without the destination computer 310 having particular applications installed, as the talk back applet provides the necessary functionality. Similarly, a multi-point communication may be established by sending the live e-mail including the talk back applet to a number of users. All recipients that open the messages, will connect to the audio module 515 of the initiating computer 305 and is be able to talk to and hear each other simultaneously.

In a preferred implementation, the "live e-mail" application is also resident on the hard disk drive 110 of the destination computer 310. In this implementation, the user of the destination computer 310 initiates the sending of another "live" electronic mail (e-mail) message and performing the steps of method 400 where the destination computer 310 becomes the initiating computer 305 and vice versa.

Fig. 5C shows a schematic block diagram of the case where both the initiating computer 305 and the destination computer 310 have the live e-mail applications 502 and 512 installed. In addition to the functionality described in relation to Fig. 5A, a

video module 555 of the live e-mail application 512 on the destination computer 310 forms video data from data received from the digital camera 119b and streams the video data to the IP address and allocated port of the destination computer 310. The video applet 560 executing on the initiating computer 305 receives the video data and displays the video data on the display 115a of the initiating computer 305. An audio module 565 of the live e-mail application 512 on the destination computer 305 forms audio data from a signal received from the microphone 117b and streams the audio data to the IP address of the destination computer 310. The audio applet 570 accesses the destination computer's IP address to receive the streaming audio data and outputs the audio data through the speakers 118a of the initiating computer 310.

Hence, this implementation allows the users of the destination computer 310 and the initiating computer 305 to view and listen to streaming video and audio received from the other party in true multi-point, full duplex, video and audio, hence in a videoconference like manner. .

In a similar manner to that described in establishing a videoconference between two parties, more parties may be linked by sending the live e-mail to a number of destination computers 310.

However, it would be advantageous for the user of the initiating computer 305 at least to know whether the user of the destination computer(s) 310 is "on-line" before attempting to instigate a conference call. Hence, according to the preferred implementation, the live e-mail application is incorporated into an instant messaging (IM) client known in the art. The IM client is also resident on the hard disk drive 110 of the computer 100, and is read and controlled in its execution by the processor 105 of the computer 100.

The message web server 50 and the associated computers 100 allows users of those computers to form part of an on-line community. The IM client allows the user of the associated computer 100 to compile a contact list of other users within the on-line community.

The IM client communicates with the message web server 50 when the IM client is executed and the computer 100 is connected to the WWW 150 (Fig. 1). In particular, the computer 100 communicates to the message web server 50 a status notification notifying the message web server 50 that the user of the computer is now "on-line", the connection information of the computer 100 (the IP address and port number assigned to the computer 100 for that on-line session), as well as the contact list of the user. The message web server 50 creates a record for the user that is now on-line. The record includes the user status and the contact list of the user.

The message web server 50 then searches its records to determine which of the users in the contact list of that user currently have an on-line status, and replies to that computer 100 the status of each of the users in his contact list, as well as the contact information of the computer 100 of that user. In addition, the message web server 50 searches its records to determine which of the on-line users have the newly connected user entered in their contact list, and then communicates to the IM clients of those users the new status and the connection information of the computer 100 of that user.

This allows the IM client to visually indicate to the user which of the users in the contact list is currently on-line. Conveniently the user may select one or more users for the contact list for the purpose of sending and receiving conventional text messages (chat), instigating a voice call over the WWW 150 using the Internet Protocol, sending a live e-mail message or, in the case where the other computers 100 also has the live e-mail application installed, a videoconference call. With the

connection information available, the direct communication links may be established with the computers 100 of the other parties.

Fig. 5D shows a schematic block diagram of this implementation. Additional to the functionality described in relation to Fig. 5C, the IM clients 580 and 590 on the initiating computer 305 and the destination computer 510 are illustrated. The IM clients 580 and 590 allow for the sending and receiving of conventional text messages (chat) and instigating a voice call over the WWW 150 using the Internet Protocol through link 595. The message web server 50 is also illustrated for receiving the status notification, the connection information and contact lists from the computers 305 and 310 and updating the respective IM clients 580 and 590 with user status changes.

The foregoing describes only some embodiments of the present invention, and modifications and/or changes can be made thereto without departing from the scope and spirit of the invention, the embodiments being illustrative and not restrictive.

In the context of this specification, the word "comprising" means "including principally but not necessarily solely" or "having" or "including" and not "consisting only of". Variations of the word comprising, such as "comprise" and "comprises" have corresponding meanings.

The claims defining the invention are as follows:

1. A method of transmitting a digital data stream including at least one of audio, video, and audio-video data via an electronic network, said method comprising the steps of:

streaming first digital data from a source to said electronic network;

transmitting a first e-mail message from said source to at least one destination, said first e-mail message including a first application with a first address of said first digital data;

activating said first application at said destination(s); and

receiving said first digital data stream at said destination(s) using said first application dependent upon said first address.

2. A method as claimed in claim 1, wherein said source includes audio receiving means for receiving audio data from said electronic network and said first application comprises:

a first audio application for receiving an audio component of said first digital data stream; and

a second audio application for streaming audio data from said destination to said electronic network, said method comprising the further step of receiving said audio data streamed from said second application by said audio receiving means.

3. A method as claimed in claim 1 or 2, said method comprising the further step of closing said first application, wherein said first application destructs upon closure.

4. A method as claimed in claim 1 comprising the further steps of:

streaming second digital data from said destination to said electronic network;

transmitting a second e-mail message from said destination to said source, said second e-mail message including a second application with a network address of said second digital data;

activating said second application at said source; and

receiving said second digital data stream using said second application dependent upon said second address.

5. A method as claimed in any one of claims 1 to 4 wherein said step of transmitting a first e-mail message comprises the sub-steps of:

requesting a message template from a message server;

forming said first application by said message server;

receiving said message template and said first application into a browser application;

receiving at least destination data entered into said template;

transmitting said destination data and said first address to said message server; and

transmitting said first e-mail message to said destination using said destination data.

6. A method as claimed in claim 4 or 5, said method comprising the further step of closing said second application, wherein said second application destructs upon closure.

7. A method as claimed in any one of claims 1 to 6 comprising the further steps of:

sending a notification to a presence server that said source is connected to said electronic network; and

receiving by said source a connection status of a least one destination.

8. A method as claimed in claim 7 comprising the further step of sending a connection status of said source to a least one destination.

9. An apparatus for transmitting a digital data stream including at least one of audio, video, and audio-video data via an electronic network, said apparatus comprising:

means for streaming first digital data from a source to said electronic network;

means for transmitting a first e-mail message from said source to at least one destination, said first e-mail message including a first application with a first address of said first digital data;

means for activating said first application at said destination(s); and

means for receiving said first digital data stream at said destination(s) using said first application dependent upon said first address.

10. An apparatus as claimed in claim 9, wherein said source includes audio receiving means for receiving audio data from said electronic network and said first application comprises:

a first audio application for receiving an audio component of said first digital data stream; and

a second audio application for streaming audio data from said destination to said electronic network, whereby said audio receiving means receives said audio data streamed from said second application.

11. An apparatus as claimed in claim 9 or 10, said apparatus further comprising means for closing said first application, wherein said first application destructs upon closure.

12. An apparatus as claimed in claim 9 further comprising:

means for streaming second digital data from said destination to said electronic network;

means for transmitting a second e-mail message from said destination to said source, said second e-mail message including a second application with a network address of said second digital data;

means for activating said second application at said source; and

means for receiving said second digital data stream using said second application dependent upon said second address.

13. An apparatus as claimed in any one of claims 9 to 12 wherein said means for transmitting a first e-mail message comprises:

means for requesting a message template from a message server;

means for forming said first application by said message server;

means for receiving said message template and said first application into a browser application;

means for receiving at least destination data entered into said template;

means for transmitting said destination data and said first address to said message server; and

means for transmitting said first e-mail message to said destination using said destination data.

14. An apparatus as claimed in claim 12 or 13, said apparatus further comprises means for closing said second application, wherein said second application destructs upon closure.

15. An apparatus as claimed in any one of claims 9 to 14 further comprising:

means for sending a notification to a presence server that said source is connected to said electronic network; and

means for receiving by said source a connection status of a least one destination.

16. An apparatus as claimed in claim 15 further comprising means for sending a connection status of said source to a least one destination.

17. A program stored on a memory medium for transmitting a digital data stream including at least one of audio, video, and audio-video data via an electronic network, said program comprising:

code for streaming first digital data from a source to said electronic network;

code for transmitting a first e-mail message from said source to at least one destination, said first e-mail message including a first application with a first address of said first digital data;

code for activating said first application at said destination(s); and

code for receiving said first digital data stream at said destination(s) using said first application dependent upon said first address.

18. A program stored on a memory medium for transmitting a digital data stream including at least one of audio, video, and audio-video data via an electronic network, said program being substantially as described herein with reference to any one of the embodiments in the drawings.

19. A method of transmitting a digital data stream including at least one of audio, video, and audio-video data via an electronic network, said method being substantially as described herein with reference to any one of the embodiments in the drawings.

20. An apparatus for transmitting a digital data stream including at least one of audio, video, and audio-video data via an electronic network, said apparatus being substantially as described herein with reference to any one of the embodiments in the drawings.

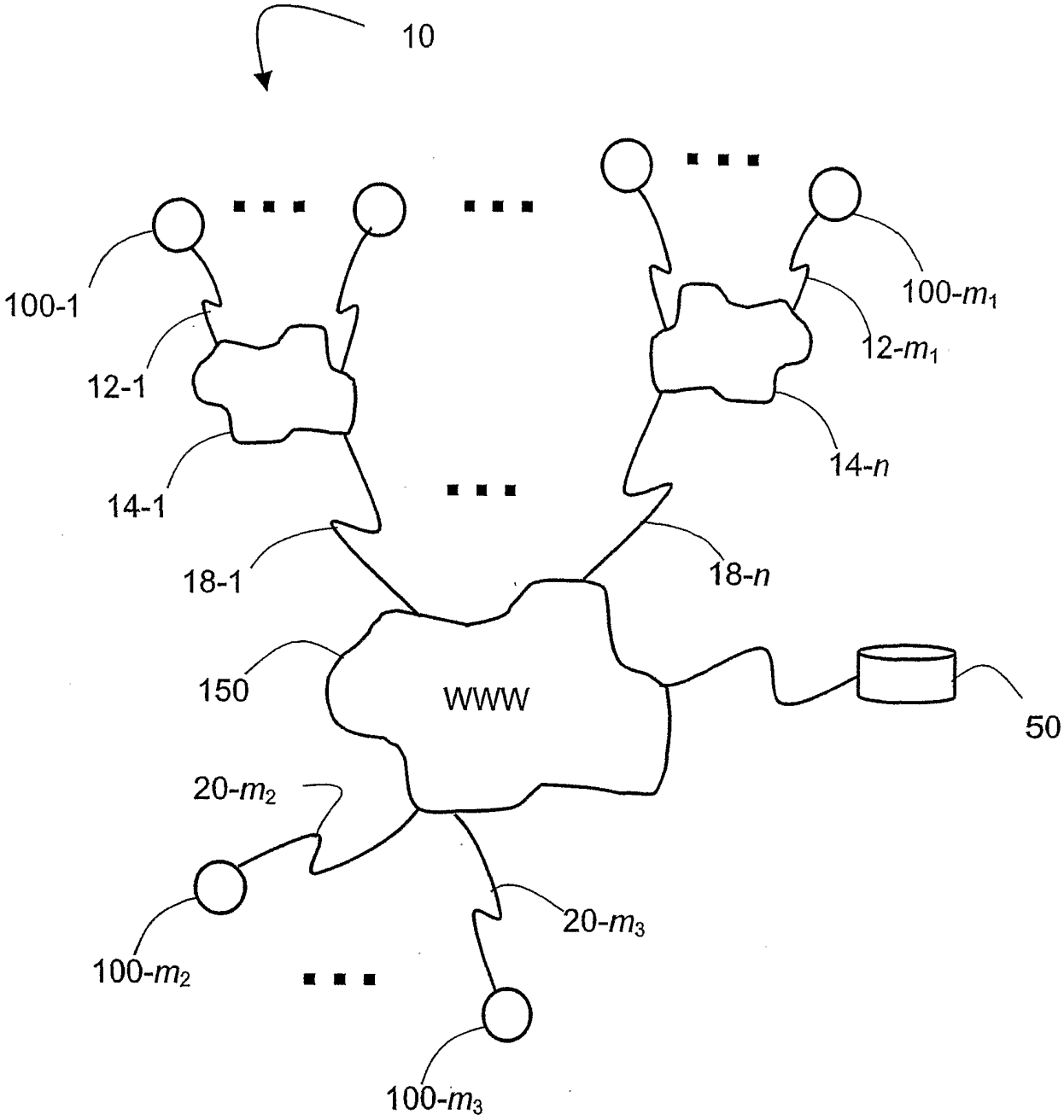

10
100-1
12-1
14-1
18-1
100-m_1
12-m_1
14-n
18-n
150
WWW
50
20-m_2
100-m_2
20-m_3
100-m_3

Fig. 1

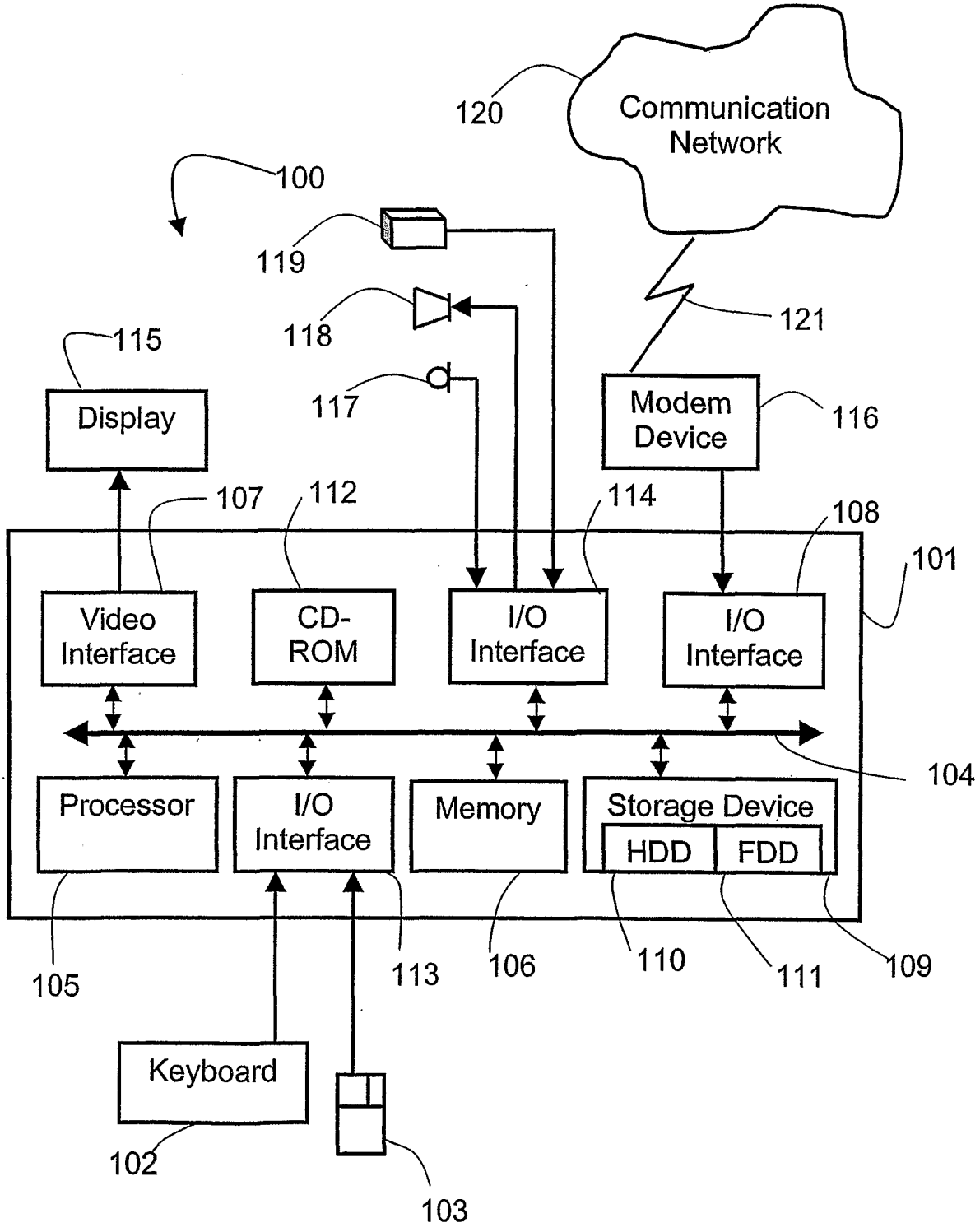

120
Communication Network
100
119
118
121
115
117
Display
Modem Device
116
107
112
114
108
101
Video Interface
CD-ROM
I/O Interface
I/O Interface
104
Processor
I/O Interface
Memory
Storage Device
HDD
FDD
105
113
106
110
111
109
Keyboard
102
103

Fig. 2

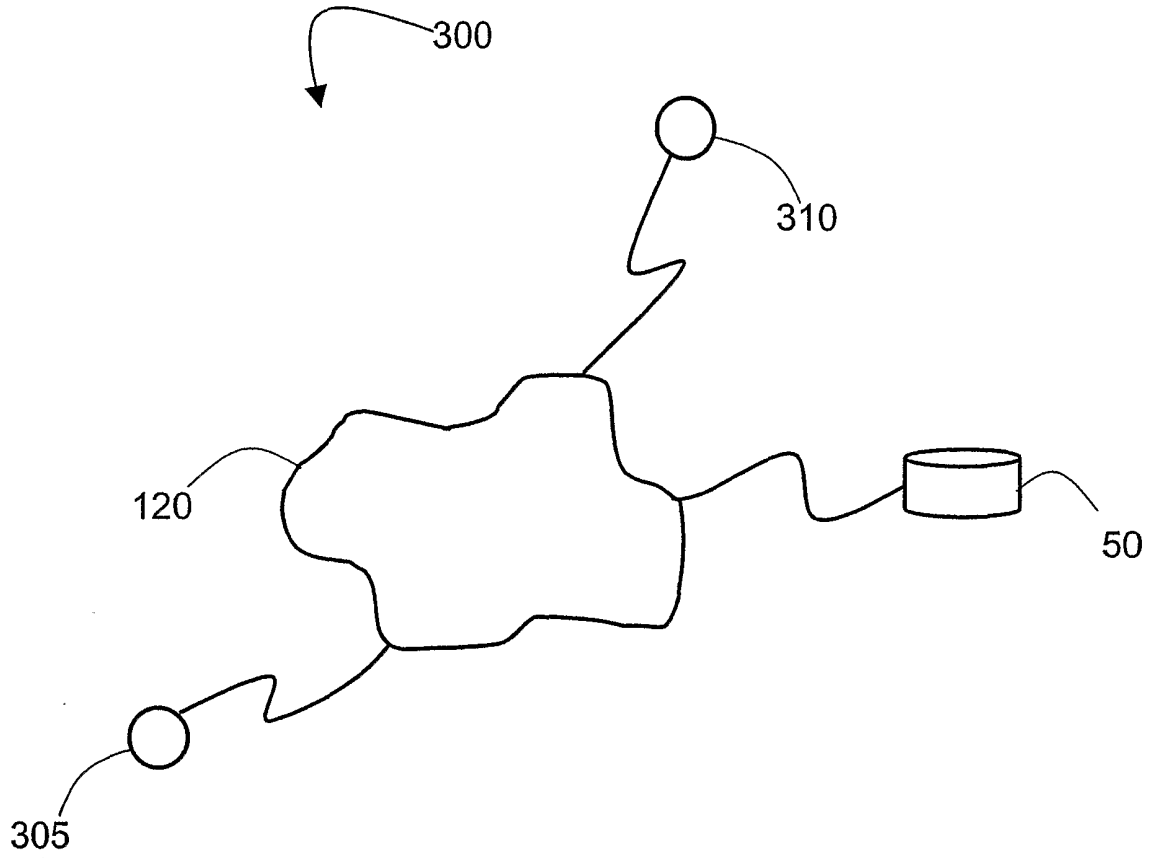


Fig. 3

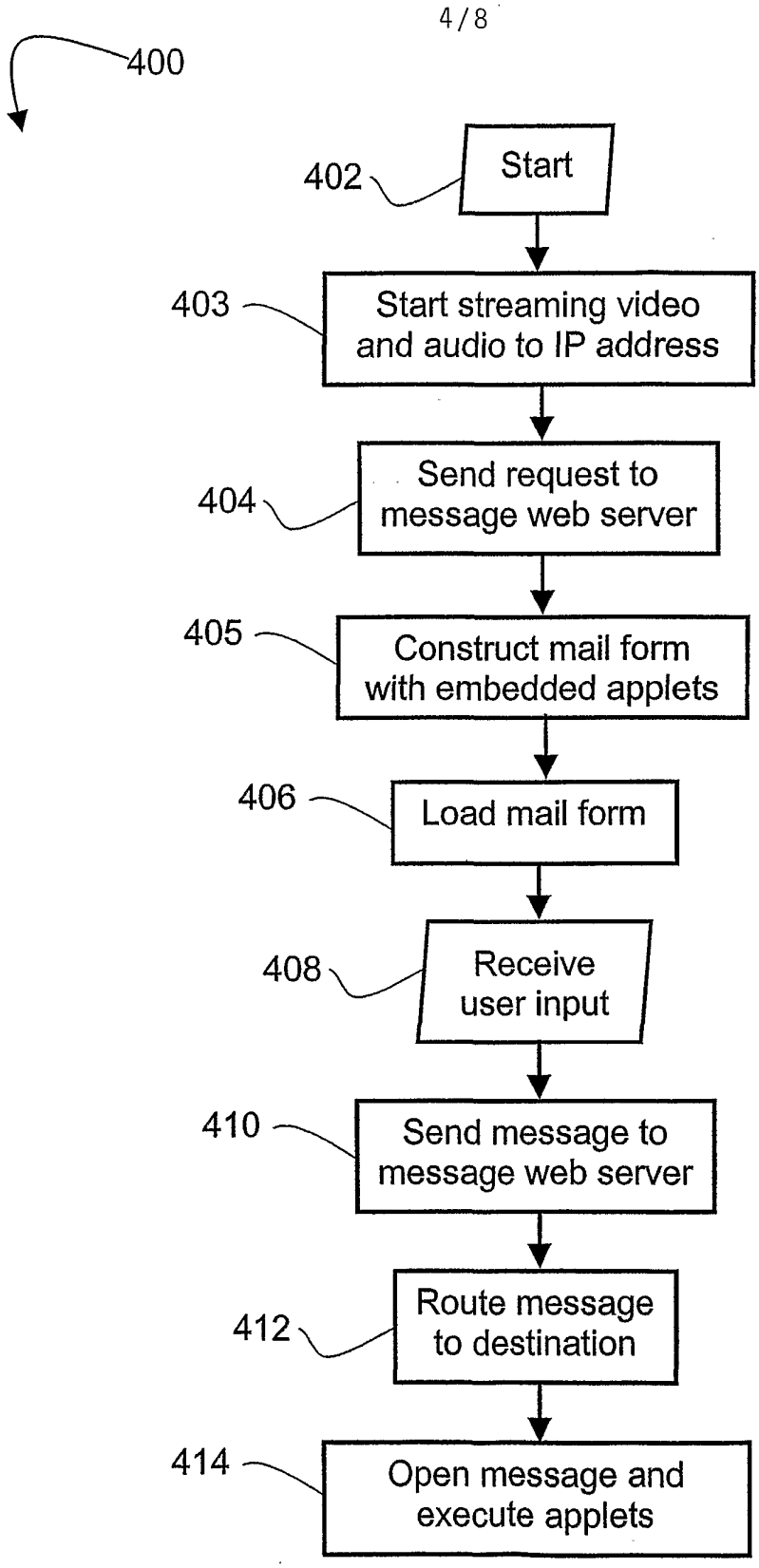
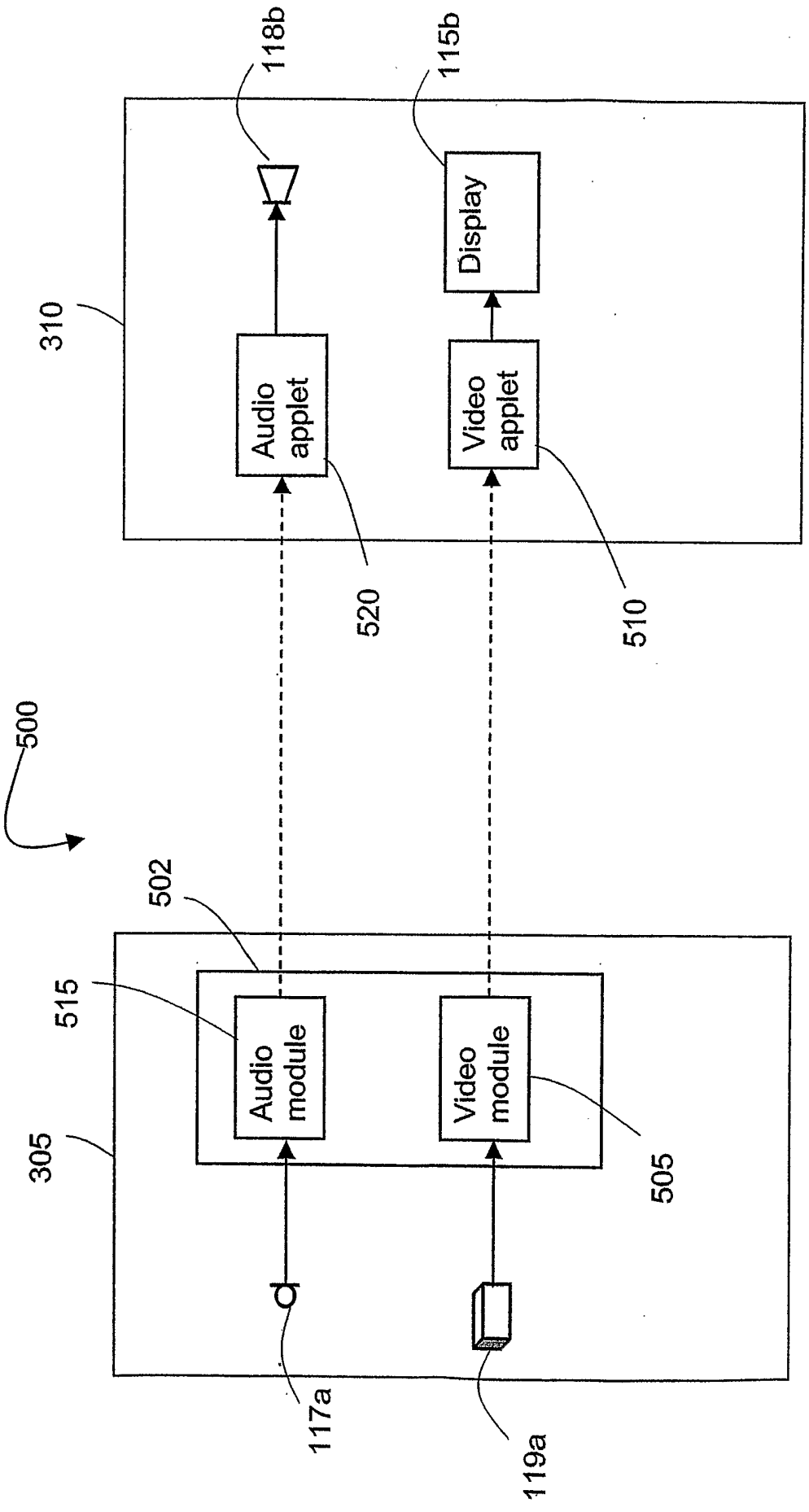

400
402
Start
403
Start streaming video and audio to IP address
404
Send request to message web server
405
Construct mail form with embedded applets
406
Load mail form
408
Receive user input
410
Send message to message web server
412
Route message to destination
414
Open message and execute applets

Fig. 4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310
Audio applet
Video applet
520
510
500
502
515
Audio module
Video module
305
505
117a
119a

Fig. 5A

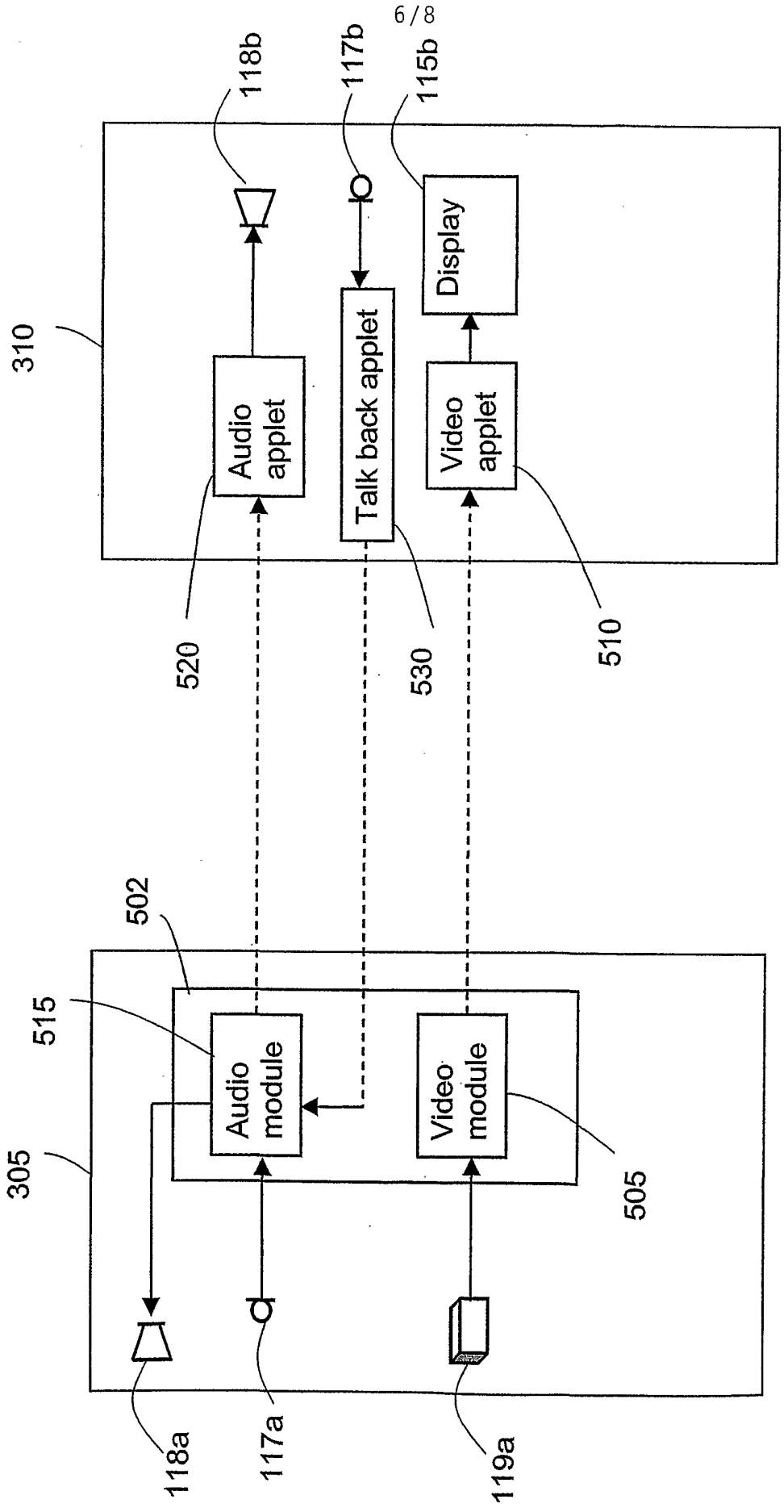
310
118b
117b
115b
Display
Audio applet
Talk back applet
Video applet
520
530
510
502
515
Audio module
Video module
505
305
118a
117a
119a

Fig. 5B

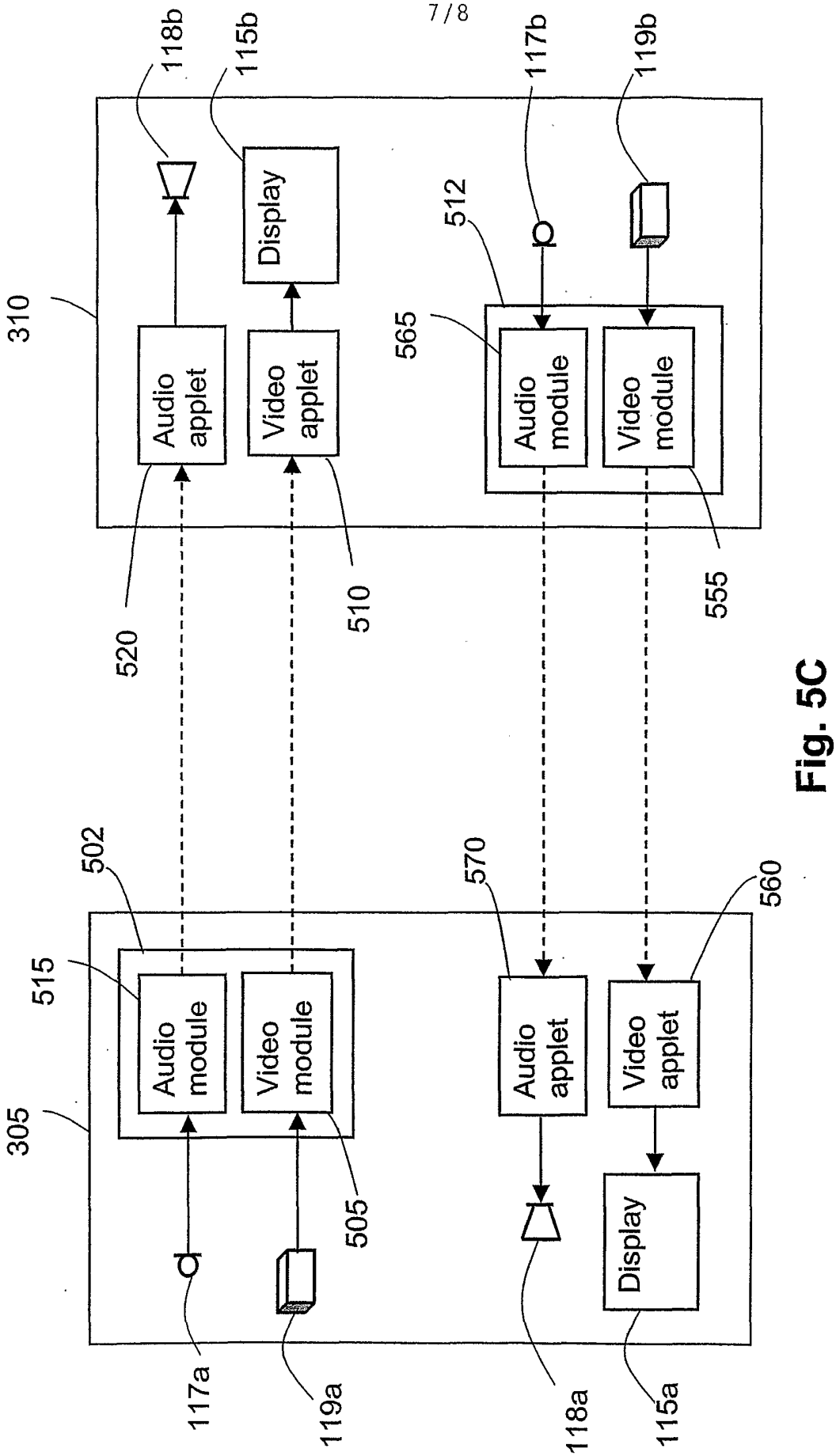
310
118b
115b
117b
119b
Display
512
565
Audio applet
Video applet
Audio module
Video module
520
510
555
502
570
560
515
305
505
Audio module
Video module
Audio applet
Video applet
Display
117a
119a
118a
115a

Fig. 5C

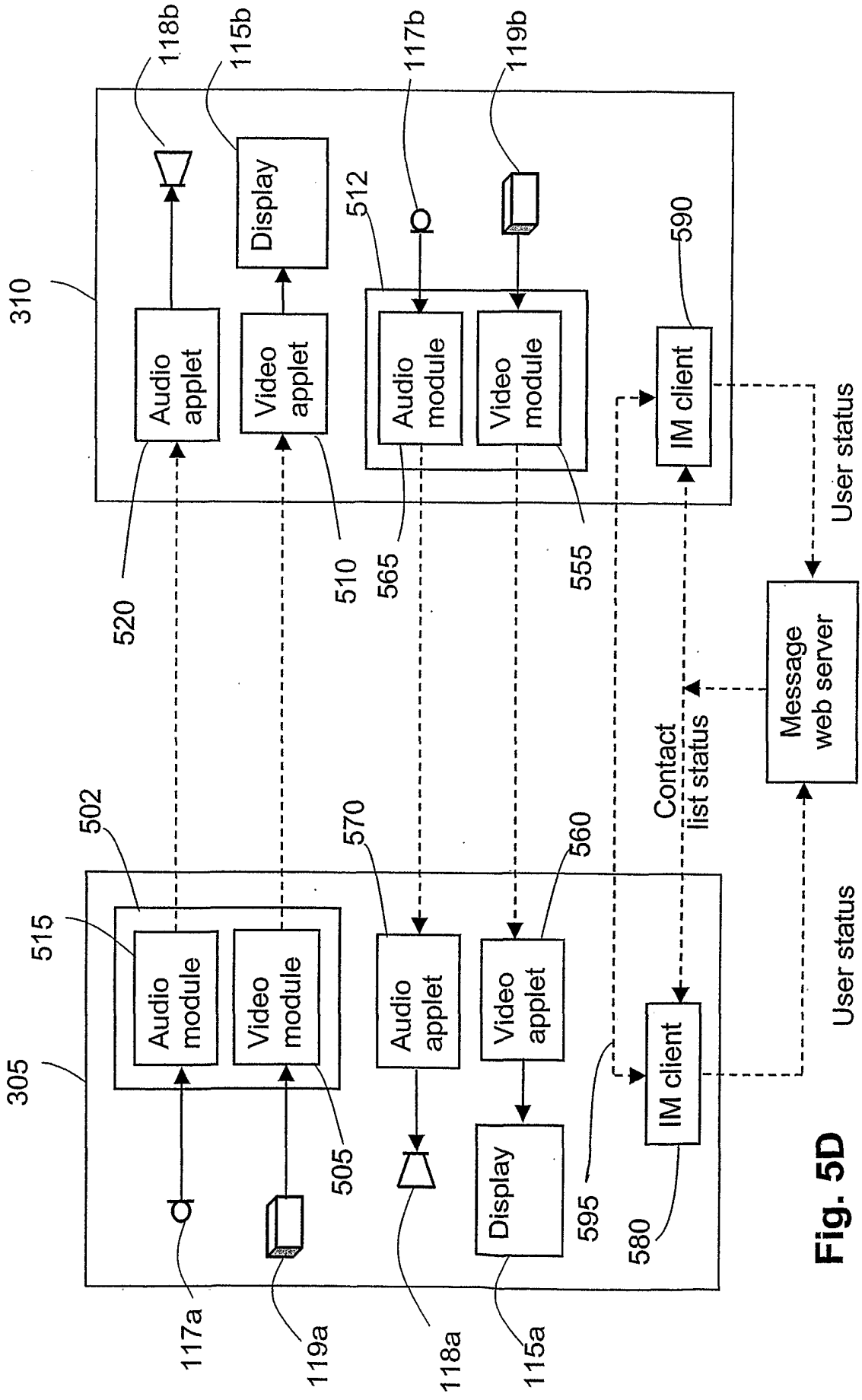
310
305
Audio applet
Video applet
Audio module
Video module
IM client
Display
Audio module
Video module
Audio applet
Video applet
IM client
Display
Message web server
User status
User status
Contact list status
118b
115b
117b
119b
590
512
520
510
565
555
502
515
570
560
505
595
580
117a
119a
118a
115a

Fig. 5D

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU02/00055

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl. [7]: G06F 17/60

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC G06F, H04L, H04N

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

AU:IPC AS ABOVE

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

WPAT, USPTO

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,A	WO 0110128A, VIDEOSHARE INC, 8 February 2001	
P,A	US 6332164B, JAIN, 18 December 2001	
A	WO 0007336A, WEB TV NETWORKS INC, 10 February 2000	

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

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
26 March 2002	8 APR 2002
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized officer **S KAUL** Telephone No : (02) 6283 2182

INTERNATIONAL SEARCH REPORT	International application No. PCT/AU02/00055

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5781901A, KUZMA, 14 July 1998	
A	WO 0152477A, INFORMIO INC, 5 January 2001	

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/AU02/00055

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member					
WO	200110128	AU	200065142	AU	200065154	AU	200065156
		WO	200110126	WO	200110127		
US	6332164	NONE					
WO	200007336	AU	51113/99	US	6223213	US	2001004743
US	5781901	NONE					
WO	200152477	AU	200126296	AU	200126297	AU	200126336
		AU	200127626	US	2001040886	US	2001043592
		US	2001048676	US	2002006124	WO	200152503
		WO	200152509	WO	200152514		

END OF ANNEX