

display an identification name list of sites including the first transmission terminal and the second transmission terminal which are attending the video communication, based on the acquire information during the video communication,

wherein the first transmission terminal is configured to display video images from each transmission terminal attending the video communication simultaneously.

11. (Currently Amended) The system of claim 10, wherein the management apparatus is configured to:

receive an information request signal from the first transformation terminal when the first transmission terminal is in video communication with at least the second transmission terminal, the information request signal indicating a request for information on a transmission terminal, including the second transmission terminal, ~~with which the first transmission terminal is in video communication, the attendance states associated with the first transmission terminal and the second transmission terminal each indicating in video communication.~~

12. (Previously Presented) The transmission management apparatus of claim 1, wherein the transmission management apparatus is composed of one or more computers.

13. (Previously Presented) The method of claim 9, wherein the transmission management apparatus is composed of one or more computers.

14. (Previously Presented) The system of claim 10, wherein the transmission management apparatus is composed of one or more computers.

15. (Currently Amended) The transmission management apparatus of claim 1, wherein the transmission management apparatus is configured to:

receive an information request signal from the first transmission ~~transformation~~ terminal when the first transmission terminal is in video communication with at least the second transmission terminal, the information request signal indicating a request for information on a transmission terminal, including the second transmission terminal, ~~with which the first transmission terminal is in video communication, the attendance states associated with the first transmission terminal and the second transmission terminal each indicating in video communication.~~

16. (Currently Amended) The method of claim 9, further comprising:

receiving, by the transmission management apparatus, an information request signal from the first transformation terminal when the first transmission terminal is in video communication with at least the second transmission terminal, the information request signal indicating a request for information on a transmission terminal, including the second transmission terminal, with which the first transmission terminal is in video communication, ~~the attendance states associated with the first transmission terminal and the second transmission terminal each indicating in video communication.~~

17. (New) A non-transitory computer-readable storage medium storing executable instructions, which when executed by circuitry, cause the circuitry to perform a method comprising:

storing first information including a first identification name and a first attendance state associated with a first transmission terminal, and second information including a second identification name and a second attendance state associated with a second transmission terminal;

updating the first attendance state associated with the first transmission terminal to a state indicating that the first transmission terminal is attending a video communication, based on attendance request information for video communication received from the first transmission terminal;

updating when the second transmission terminal attends the video communication, the second attendance state associated with the second transmission terminal to a state indicating that the second transmission terminal is attending the video communication;

acquiring information including an identification name associated with a transmission terminal with which an attendance state is associated and in which the attendance state indicates that the transmission terminal is attending the video communication; and

transmitting the acquired information to the first transmission terminal, wherein the acquired information is used for displaying an identification name list of sites including the first transmission terminal and the second transmission terminal which are attending the video communication during the video communication,

wherein the first transmission terminal is configured to display video images from each transmission terminal attending the video communication simultaneously.

18. (New) The method of claim 9, further comprising:

storing a terminal management table that contains the first information.

19. (New) The method of claim 9, further comprising:

storing a first identifier for identifying the first transmission terminal and a second identifier for identifying the second transmission terminal.

20. (New) The method of claim 9, wherein the identification name associated with a particular transmission terminal of the plurality of transmission terminals is information to be registered or changed in response to a request from the particular transmission terminal.

21. (New) The method of claim 9, wherein other transmission terminals of the plurality of transmission terminals, which are other than the first transmission terminal and are attending a same conference, transmit or receive at least one of image data and sound data to or from each other via a relaying apparatus.

22. (New) The method of claim 9, wherein each of the plurality of transmission terminals is one of a video conference terminal, a car navigation device, and a cell phone.

23. (New) The method of claim 9, further comprising:

storing the first identification name in association with first identification information;

and

storing the second identification name in association with second identification information.

24. (New) The method of claim 9, further comprising:

storing a destination list associated with first identification information transmitted from the first transmission terminal, and the destination list registers at least the second transmission terminal as a destination candidate.

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)		Docket Number (Optional) 16408US04CON																														
Application Number 16/903,713	Filed 17 Jun 2020																															
For TRANSMISSION MANAGEMENT APPARATUS																																
Art Unit 2652	Examiner EL-ZOOBI, MARIA																															
This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application. The requested extension and fee are as follows (check time period desired and enter the appropriate fee below): <table style="width: 100%; border-collapse: collapse;"><thead><tr><th></th><th style="text-align: center;"><u>Fee</u></th><th style="text-align: center;"><u>Small Entity Fee</u></th><th style="text-align: center;"><u>Micro Entity Fee</u></th><th></th></tr></thead><tbody><tr><td>☒ One month (37 CFR 1.17(a)(1))</td><td style="text-align: right;">\$220</td><td style="text-align: right;">\$110</td><td style="text-align: right;">\$55</td><td style="text-align: right;">\$ <u>220</u></td></tr><tr><td>☐ Two months (37 CFR 1.17(a)(2))</td><td style="text-align: right;">\$640</td><td style="text-align: right;">\$320</td><td style="text-align: right;">\$160</td><td style="text-align: right;">\$ _____</td></tr><tr><td>☐ Three months (37 CFR 1.17(a)(3))</td><td style="text-align: right;">\$1,480</td><td style="text-align: right;">\$740</td><td style="text-align: right;">\$370</td><td style="text-align: right;">\$ _____</td></tr><tr><td>☐ Four months (37 CFR 1.17(a)(4))</td><td style="text-align: right;">\$2,320</td><td style="text-align: right;">\$1,160</td><td style="text-align: right;">\$580</td><td style="text-align: right;">\$ _____</td></tr><tr><td>☐ Five months (37 CFR 1.17(a)(5))</td><td style="text-align: right;">\$3,160</td><td style="text-align: right;">\$1,580</td><td style="text-align: right;">\$790</td><td style="text-align: right;">\$ _____</td></tr></tbody></table> ☐ Applicant asserts small entity status. See 37 CFR 1.27. ☐ Applicant certifies micro entity status. See 37 CFR 1.29. Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously. ☐ A check in the amount of the fee is enclosed. ☐ Payment by credit card. Form PTO-2038 is attached. ☐ The Director has already been authorized to charge fees in this application to a Deposit Account. ☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number <u>602325</u>. ☒ Payment made via EFS-Web. WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038. I am the ☐ applicant. ☒ attorney or agent of record. Registration number <u>56,944</u>. ☐ attorney or agent acting under 37 CFR 1.34. Registration number _____. <u>/Derek P. Benke/</u> <u>2022-8-5</u> Signature Date <u>Derek P. Benke</u> <u>571-376-6333</u> Typed or printed name Telephone Number NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.				<u>Fee</u>	<u>Small Entity Fee</u>	<u>Micro Entity Fee</u>		☒ One month (37 CFR 1.17(a)(1))	\$220	\$110	\$55	\$ <u>220</u>	☐ Two months (37 CFR 1.17(a)(2))	\$640	\$320	\$160	\$ _____	☐ Three months (37 CFR 1.17(a)(3))	\$1,480	\$740	\$370	\$ _____	☐ Four months (37 CFR 1.17(a)(4))	\$2,320	\$1,160	\$580	\$ _____	☐ Five months (37 CFR 1.17(a)(5))	\$3,160	\$1,580	\$790	\$ _____
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☒ * Total of <u>1</u> forms are submitted.
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This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public, which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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VERIFICATION OF TRANSLATION

I, Tadashige Itoh, a Patent Attorney of Tokyo, Japan having my office at 16th Floor, Marunouchi MY PLAZA (Meiji Yasuda Seimei Building), 1-1, Marunouchi 2-chome, Chiyoda-ku, Tokyo 100-0005 Japan do solemnly and sincerely declare that I am the translator of the attached English translation and certify that the attached English translation is a correct, true and faithful translation of Japanese Patent Application No. 2011-006934 to the best of my knowledge and belief.

Dated July 6, 2022



Tadashige Itoh

Patent Attorney
ITOH International Patent Office
16th Floor, Marunouchi MY
PLAZA (Meiji Yasuda Seimei
Building), 1-1, Marunouchi
2-chome, Chiyoda-ku, Tokyo
100-0005 Japan

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(Inventor)	
(Residence or Address)	c/o RICOH COMPANY, LTD., 3-6, Nakamagome 1-chome, Ohta-ku, Tokyo, Japan
(Name)	Alain Volmat
(Inventor)	
(Residence or Address)	c/o RICOH COMPANY, LTD., 3-6, Nakamagome 1-chome, Ohta-ku, Tokyo, Japan
(Name)	Shizu Kanauchi
(Inventor)	
(Residence or Address)	c/o RICOH COMPANY, LTD., 3-6, Nakamagome 1-chome, Ohta-ku, Tokyo, Japan
(Name)	Yoshinaga Kato
(Inventor)	
(Residence or Address)	c/o RICOH COMPANY, LTD., 3-6, Nakamagome 1-chome, Ohta-ku, Tokyo, Japan
(Name)	Takahiro Asai
(Applicant for Patent)	
(Identification Number)	000006747
(Name)	RICOH COMPANY, LTD.

{Attorney}

(Identification Number) 100070150
(Patent Attorney)
(Name) Tadahiko Itoh
(Telephone Number) 03-5223-6011
(Liaison) Patent Attorney 100127100
Mikihiro Sakai

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[NAME OF THE DOCUMENT] SPECIFICATION

[TITLE OF THE INVENTION] DATA PROCESSING APPARATUS
AND PROGRAM

[FIELD OF THE INVENTION]

5 **[0001]**

 The present invention relates to a data
processing apparatus connected to a server via
networks and a computer-readable recording medium and
more specifically, to a data processing apparatus
10 capable of providing its function with an
authentication by a server and a computer-readable
recording medium.

[BACKGROUND ART]

[0002]

15 There is known a network system in which a
terminal accessing a server uses a function provided
by the server. In this case, the server
authenticates a user by an ID and a password sent by
the terminal so that only a specified user can use
20 the function of the server (see Patent Document 1,
for example).

[0003]

 It is disclosed in Patent Document 1 a data
searching system in which, when a personal computer
25 (PC) stores content of a database in a memory card,

the content of the database is encoded by a DB key
and the DB key is encoded by an encoded password
corresponding to a user. At this time, the encoded
DB key and the encoded password are also stored in
5 the memory card. In the system, when a mobile
terminal accesses the database from the memory card,
the system accepts a password from the user, encodes
the accepted password by the password itself,
compares the obtained encoded password to the encoded
10 password stored in the memory card, and permits
accessing to the database when these passwords match.

[SUMMARY OF THE INVENTION]

[PROBLEM TO BE SOLVED BY THE INVENTION]

[0004]

15 However, there may be a case where a terminal
that uses a function provided by a server to provide
a service to a user is a built-in type apparatus
which does not include a user interface (UI) such as
an input unit or a display unit, different from PCs
20 or mobile terminals. Such built-in type apparatuses
are widely used in consumer electronics, industrial
electronics or the like to actualize specific
functions.

[0005]

25 In built-in type apparatuses, when a server

starts providing a service, it may perform device authentication to determine whether or not the device is eligible to provide the service. In the case of built-in type apparatuses that do not have a UI, it is difficult for users to enter their IDs and passwords, so the built-in type apparatuses store some authentication information in nonvolatile memory and send the information to the server, which can then determine whether or not the authentication is successful.

[0006]

However, such authentication methods for embedded devices have the problem that if a third party duplicates the programs and data inside the built-in type apparatuses with their authentication information and installs them in other apparatuses, other apparatuses that are originally not allowed to receive services will be able to receive services from the server.

[0007]

To address this problem, the server could request a password from the built-in type apparatuses, and if the user enters the correct password, the server will start providing the service. However, small built-in type apparatuses,

etc., may not even require the user to enter the password in the first place, as they may not be equipped with a numeric keypad or keyboard necessary to enter the password, a password request message, or
5 a means of displaying the password entered by the user.

[0008]

The present invention is made in light of the above problems, and provides a data processing
10 apparatus capable of authentication without requesting a user to input a password.

[MEANS TO SOLVE PROBLEMS]

[0009]

The present invention has been made based on the
15 knowledge the inventors have obtained and has the following configurations. According to an embodiment, there is provided a data processing apparatus providing a predetermined function by executing a program. The data processing apparatus
20 includes

an operational input accepting unit that accepts turning on power;

a first storage unit that encodes execution starting data for starting execution of the program
25 and stores the execution starting data;

a start up unit that obtains an encode-decode key for decoding the execution starting data and decodes the execution starting data with the encode-decode key to start the program when the operational
5 input accepting unit accepts the turning on the power; and

an authentication unit that sends a request for authentication to an external apparatus after the start up unit has started the program, and that
10 starts providing the predetermined function when obtaining an authentication result indicating the apparatus is authenticated from the external apparatus.

[ADVANTAGEOUS EFFECTS OF THE INVENTION]

15 [0010]

The present invention provides a data processing apparatus capable of authentication without requesting a user to input a password.

20 [BRIEF DESCRIPTION OF THE DRAWINGS]

[0011]

Fig. 1 is a schematic view of an example of a structure of a terminal authentication system;

Fig. 2 is a view of an example of a hardware
25 structure of a terminal;

Fig. 3 is a view of an example of a hardware structure of a server;

Fig. 4 is a view of an example of a functional block diagram of the terminal authentication system;

5 Fig. 5A is a drawing showing an example of a terminal authentication management table;

Fig. 5B is a drawing showing an example of a terminal management table;

10 Fig. 5C is a drawing showing an example of a destination list management table;

Fig. 6 is a sequence view showing an example of operations from turning on power to displaying a destination list;

15 Fig. 7 is a drawing showing an example of a destination list generated by a destination list generating unit in step S34 in Fig. 6;

Fig. 8 is a block diagram of a part of the hardware structure of the terminal shown in Fig. 2;

20 Fig. 9 is a view showing an example of a method of encoding or decoding the data stored in the HD;

Fig. 10 is a view showing an example of a method of encoding or decoding the data stored in the HD;

Fig. 11 is a drawing showing an example of a start-up operation of the terminal;

25 Fig. 12A is a flowchart showing an example of a

procedure for an application program to write data to
the HD;

Fig. 12B is a flowchart showing an example of a
procedure for an application program to write data to
5 the HD;

Fig. 13 is a flowchart showing an example of an
authentication result confirming operation; and

Fig. 14 is a drawing showing an example of the
error message shown on the display.

10

[EMBODIMENTS OF THE INVENTION]

[0012]

In the following, embodiments of the present
invention will be described below with reference to
15 drawings.

Fig. 1 a view of an example a terminal
authentication system 100 according to the present
embodiment. The terminal authentication system 100
includes a server 50 and plural terminals connected
20 via a communication network 2. Although the terminal
10 may be any kinds of devices, a data processing
apparatus including a projector is shown in Fig. 1 as
the terminal 10 for example. A display 120 is
connected to the terminal 10. The server 50 provides
25 various services such as authenticating terminals,

sending various data, updating programs stored in the terminals or the like.

[0013]

The terminals 1 to n may be data processing
5 apparatuses having the same function as that of the terminal 10, or data processing apparatuses having different functions from that of the terminal 10. The terminal 10 and one or more of the terminals 1 to n are capable of sending and receiving data with each
10 other through the server 50.

[0014]

The communication network 2 may be an in-house LAN, a WAN in which LANs are connected through Ethernet (registered trademark), an IP-VPN or the
15 like, an Internet which is connected with the LAN or the WAN through a router or the like. The terminal 10 and the terminals 1 to n are capable of having communications with each other within an office, a company, or between offices or branch offices of
20 different countries, or the like. The communications may be confidentially performed by a secure socket layer (SSL) or the like.

[0015]

Fig. 2 is a view of an example of a hardware
25 structure of the terminal 10. The terminal 10

includes a central processing unit (CPU) 101, a read-only memory (ROM) 102, a random access memory (RAM) 103, a hard disk (HD) 122, a hard disk drive (HDD) 121, a flash memory 104, a solid state drive (SSD) 105, a media drive 107, an operational button 108, a power switch 109, a network Interface (I/F) 111, an internal camera 112, an image sensor I/F 113, an internal microphone 114, an internal speaker 115, a voice data input output I/F 116, a display I/F 117, an external device connecting I/F 118, a basic input/output system (BIOS) ROM 123, and a bus line 110.

[0016]

The CPU 101 completely controls the terminal 10. The ROM 102 stores a program for driving the CPU 101 such as an initial program loader (IPL) or the like. The RAM 103 is used as a working area of the CPU 101. The HD 122 stores various data such as a program for the terminal (which is simply referred to as a terminal program hereinafter), apparatus identification data (ID) that uniquely identifies the terminal 10 or the like. The HDD 121 controls reading and writing of various data from the HD 122 in accordance with the control of the CPU 101. The flash memory 104 stores various data such as video data,

voice data and the like. The SSD 105 controls
reading and writing of various data from the flash
memory 104 in accordance with the control of the CPU
101. The media drive 107 controls reading and writing
5 (recording) of data from a recording medium 106 such
as a flash memory or the like. The operational button
108 is operated to select a destination terminal to
communicate with, which is opposite of the terminal
10. The power switch 109 switches on and off the
10 power of the terminal 10. The network I/F 111
performs data transmission through the communication
network 2. The BIOS ROM 123 stores a program for
inputting and outputting data at a basic level
between hardware. The internal camera 112 takes a
15 photograph in accordance with the control of the CPU
101 to obtain image data. The image sensor I/F 113
controls driving of the internal camera 112. The
internal microphone 114 inputs voice data. The
internal speaker 115 outputs voice data. The voice
20 data input output I/F 116 processes input and output
of voice signals between the internal microphone 114
and the internal speaker 115 in accordance with the
control of the CPU 101. The display I/F 117 transmits
image data to the display 120 in accordance with the
25 control of the CPU 101. The external device

connecting I/F 118 connects various external devices to the terminal 10. The bus line 110 may be an address bus, a data bus and the like which electrically connect the above components.

5 **[0017]**

The display 120 may be a display unit composed of a liquid crystal display (LCD) or an organic electroluminescence (EL) display on which an image of an object, operational icons or the like are shown.

10 The display 120 may include a touch panel. The display 120 is connected to the display I/F 117 through a cable 120c. The cable 120c may be a cable for analog RGB (VGA) signals, a cable for a component video, or a cable for a high-definition multimedia
15 interface (HDMI) or a digital video interactive (DVI).

[0018]

The internal camera 112 includes a lens, and a solid-state image sensing device such as a
20 complementary metal oxide semiconductor (CMOS), a charge coupled device (CCD) or the like that converts light into charges to form an electronic image of an object.

[0019]

25 External devices such as an external camera, an

external speaker, and the like are capable of being connected to the external device connecting I/F 118 through universal serial bus (USB) cables or the like. When the external camera is connected, the
5 external camera may be driven in preference to the internal camera 112 in accordance with the control of the CPU 101. Similarly, when the external microphone or the external speaker is connected, the external microphone or the external speaker may be driven in
10 preference to the internal microphone 114 or the internal speaker 115 in accordance with the control of the CPU 101, respectively.

[0020]

The recording medium 106 is removable with
15 respect to the terminal 10. Further, an electrically erasable and programmable ROM (EEPROM) or the like may be used instead of the flash memory 104 as long as it is a nonvolatile memory capable of having data read and written from in accordance with the control
20 of the CPU 101.

[0021]

The terminal program may be stored in a computer readable recording medium such as the recording medium 106 or the like in a file format to be
25 distributed which is installable and executable by a

computer. Alternately, the terminal program may be stored in the ROM 102 instead of being stored on the HD 122.

[0022]

5 Fig. 3 is a drawing showing an example of a hardware structure of the server 50. The server 50 includes a CPU 201, a ROM 202, a RAM 203, a HD (Hard disk) 204, a HDD (Hard disk Drive) 205, a media drive 207, a display 208, a network I/F 209, a keyboard
10 211, a mouse 212, a CD-ROM drive 214, and a bus line 210. The CPU 201 completely controls the server 50. The ROM 202 stores a program for driving the CPU 201 such as an initial program loader (IPL) or the like. The RAM 203 is used as a working area of the CPU 201.
15 The HD 204 stores various data such as a program for the server (which is simply referred to as a server program hereinafter) or the like. The HDD 205 controls reading and writing of various data from the HD 204 in accordance with the control of the CPU 201.
20 The media drive 207 controls reading and writing (recording) of data from a recording medium 206 such as a flash memory or the like. The display 208 shows various information such as a cursor, a menu, a window, characters, images or the like. The network
25 I/F 209 performs data transmission through the

communication network 2. The keyboard 211 includes plural keys for inputting characters, numerals, various instructions and the like. The mouse 212 performs a selection or operation of various instructions, a selection of an object to be operated, a movement of the cursor or the like. The CD-ROM drive 214 controls reading or writing of various data from a compact disc read-only memory (CD-ROM) 213, which is an example of a removable recording medium. The bus line 210 may be an address bus, a data bus and the like which electrically connect the above components.

[0023]

The server program may be stored in a computer readable recording medium such as the recording medium 206, the CD-ROM 213, or the like in a file format installable and executable by a computer to be distributed. The server program may be stored in the ROM 202 instead of being stored on the HD 204.

[0024]

<Functional structure of the terminal>

Fig. 4 is an example of a functional block diagram of the terminal authentication system 100. The terminal 10 includes a sending and receiving unit 11, a login requesting unit 13, a voice data input

unit 15a, a voice data output unit 15b, a destination
list generating unit 20, a start up unit 17, an
operational input accepting unit 12, an imaging unit
14 and a display control unit 16. These components
5 are functions or units respectively actualized or
activated by operating either of the components shown
in Fig. 2 by instructions from the CPU 101 in
accordance with the terminal program or other
programs, such as a BIOS program or a start-up
10 program, which will be explained later in detail. The
programs are developed on the RAM 103 from the HD
122.

[0025]

The sending and receiving unit 11 of the
15 terminal 10 is actualized by an instruction from the
CPU 101 in accordance with the terminal program and
the network I/F 111. The sending and receiving unit
11 sends and receives various data (or information)
between other terminals, apparatuses, or the server
20 50 through the communication network 2.

[0026]

The operational input accepting unit 12 is
actualized by an instruction from the CPU 101 in
accordance with the BIOS program or the like, the
25 operational button 108 and the power switch 109. The

operational input accepting unit 12 accepts various inputs from a user. When the user switches on the power switch 109, for example, the operational input accepting unit 12 accepts such turning on power to provide an electric power from a source to each of the components.

[0027]

The login requesting unit 13 is actualized by an instruction from the CPU 101. The login requesting unit 13 automatically sends, upon being triggered by the ON operation of power switch 109, login requesting data, a requesting terminal ID, a password and a current IP address of the terminal (terminal 10aa) to the server 50 from the sending and receiving unit 11 through the communication network 2.

[0028]

The imaging unit 14 is actualized by an instruction from the CPU 101 in accordance with the terminal program, the internal camera 112 and the image sensor I/F 113. The imaging unit 14 takes a photograph of an object to obtain image data, and outputs the image data.

[0029]

The voice data input unit 15a is actualized by an instruction from the CPU 101 in accordance with

the terminal program and the voice data input output I/F 116. The voice data input unit 15a inputs voice data after a voice of a user is converted by the internal microphone 114 to a voice signal. The voice data output unit 15b is actualized by an instruction from the CPU 101 in accordance with the terminal program and the voice data input output I/F 116. The voice data output unit 15b outputs voice signals to the internal speaker 115 to have the voice output from the internal speaker 115.

[0030]

The display control unit 16 is actualized by an instruction from the CPU 101 in accordance with the terminal program and the display I/F 117. The display control unit 16 controls an operation of sending image data to the display 120.

[0031]

The destination list generating unit 20 generates and updates a destination list as shown in Fig. 7 based on destination list data and online status data of candidates of a destination terminal, received from the server 50, which will be explained later.

[0032]

The terminal ID of the present embodiment may be

identification data for uniquely identifying the terminal 10 composed of languages, characters, symbols, other various marks, or a combination of at least two of them. The start up unit 17 starts a
5 sequence of a start-up program up to starting up a terminal program, upon being notified by the operational input accepting unit 12 that the power is turned on.

[0033]

10 <Functional structure of the server>

The server 50 includes a sending and receiving unit 51, a terminal authentication unit 52, a status management unit 53, a terminal extracting unit 54 and a terminal status obtaining unit 55. These
15 components are functions or units respectively actualized or activated by operating either of the components shown in Fig. 3 by instructions from the CPU 201 in accordance with the server program which is developed on the RAM 203 from the HD 204. The HD
20 204 includes a terminal authentication management database (DB) 5002, a terminal management DB 5003 and a destination list management DB 5004.

[0034]

(Terminal authentication management table)

25 Fig. 5A shows an example of a terminal

authentication management table stored in the terminal authentication management DB 5002. The terminal authentication management table includes terminal IDs of all of the terminals 10 managed by the server 50 with their corresponding passwords. For example, for the terminal authentication management table shown in Fig. 5A, the terminal ID of "01aa" corresponds with the password of "aaaa".

[0035]

10 (Terminal management table)

Fig. 5B shows an example of a terminal management table stored in the terminal management DB 5003. The terminal management table includes terminal IDs for each of the terminals, a name of the terminal, an online status of the terminal, a date when the login requesting data is received by the server 50 from the terminal and an IP address of the terminal corresponding with the terminal ID.

[0036]

20 (Destination list management table)

Fig. 5C shows an example of a destination list management table stored in the destination list management DB 5004. The destination list management table includes the terminal ID of the terminal that requests starting of a communication via a video

conference (hereinafter, simply referred to as a
requesting terminal ID as well) and terminal IDs of
all of the terminals that are registered as
candidates of destination terminals, the opposite
5 side in another word, of the communication
(hereinafter, simply referred to as a destination
terminal ID as well) with respect to the requesting
terminal ID. For example, as shown in Fig. 5C, the
requesting terminal ID of "01aa" is corresponding
10 with the destination terminal IDs of "01ab", ...,
"01ba", "01bb", ..., "01ca", "01cb", "01da", and
"01db", ... of the candidates to which the requesting
terminal can request starting communication via the
video conference.

15 **[0037]**

The sending and receiving unit 51 is actualized
by an instruction from the CPU 201 in accordance with
the server program and the network I/F 209. The
sending and receiving unit 51 sends and receives
20 various data (or information) between the terminal
10, apparatuses, or systems through the communication
network 2.

[0038]

The terminal authentication unit 52 is
25 actualized by an instruction from the CPU 201 in

accordance with the server program. The terminal authentication unit 52 performs terminal authentication by using a combination of the requesting terminal ID and the password included in the login requesting data received through the sending and receiving unit 51, as a search key, to determine whether the same combination of terminal ID and password is stored in the terminal authentication management DB 5002. The terminal authentication unit 52 determines that the requesting terminal is authenticated and has the proper right, when the same combination of terminal ID and password is stored in the terminal authentication management DB 5002. In such a case, the terminal authentication unit 52 sends an authentication result indicating the terminal 10 is authenticated to the requesting terminal 10.

[0039]

The status management unit 53 is actualized by an instruction from the CPU 201 in accordance with the server program. The status management unit 53 stores and manages the terminal ID of the requesting terminal, the online status, the date when the login requesting data is received by the server 50, and the IP address of the requesting terminal corresponding

with each other in the terminal management DB 5003 in order to manage the online status of the requesting terminal that sends the login requesting data. Further, when a user of the terminal 10 switches the power switch 109 of the terminal 10 from ON to OFF, the terminal 10 sends online status data of turning off the power to the server 50. The status management unit 53 changes the online status of the terminal management DB 5003 from ON (line) to OFF (line) based on the online status data of turning off the power sent from the terminal 10.

[0040]

The terminal extracting unit 54 is actualized by an instruction from the CPU 201 in accordance with the server program. The terminal extracting unit 54 searches the destination list management DB 5004 by using the terminal ID of the requesting terminal which has sent the login requesting data as a key, and extracts the terminal IDs of the candidates of destination terminals which can communicate with the requesting terminal, by reading the terminal IDs from the destination list management DB 5004. Further, the terminal extracting unit 54 searches the destination list management DB 5004 by using the terminal ID of a first requesting terminal which has sent the login

request as a key, and extracts the terminal ID of a second requesting terminal for which the terminal ID, of the first requesting terminal, is registered as the destination terminal.

5 **[0041]**

 The terminal status obtaining unit 55 searches the terminal management DB 5003 by using the terminal IDs of the candidates extracted by the terminal extracting unit 54 as search keys, and reads out the
10 online status for each of the terminal IDs extracted by the terminal extracting unit 54. By this operation, the terminal status obtaining unit 55 can obtain the online status of the candidates of destination terminals capable of having communication
15 with the requesting terminal which has sent the login requesting data. Here, the terminal status obtaining unit 55 searches the terminal management DB 5003 by using the terminal ID of the above-described second requesting terminal extracted by the terminal
20 extracting unit 54 as the search key, as well, to obtain the online status of the above-described second requesting terminal.

[0042]

 <Operations from turning on the power to displaying a
25 destination list>

Fig. 6 is a sequence view showing an example of operations from turning on the power to displaying a destination list. Hereinafter, the terminal 10 for which the switch is turned on and that sends the login requesting data to the server 50 is referred to as a terminal 10aa (or a requesting terminal 10aa).

[0043]

When a user switches on the power switch 109, the operational input accepting unit 12 accepts the signal of turning on the power and switches on the power (step S21). Thereafter, the start up unit 17 performs the start up operations, which will be explained later (step S21-2).

[0044]

When the start up operations are completed, the login requesting unit 13 sends the login requesting data that indicates a login request from the sending and receiving unit 11 to the server 50 through the communication network 2 upon the ON operation of the power switch 109 (step S22). The login requesting data includes the terminal ID of the terminal 10aa as the requesting terminal ID, the password, and the current IP address of the terminal 10aa. Here, as will be described later, the password is one stored in the BIOS ROM 123 so that a user of the terminal

10aa does not necessarily input a password at this time.

[0045]

Then, the terminal authentication unit 52 of the
5 server 50 performs a terminal authentication by using
the combination of the requesting terminal ID and the
password included in the login requesting data
received through the sending and receiving unit 51 as
the search key, to determine whether the same
10 combination of terminal ID and password is stored in
the terminal authentication management DB 5002 (step
S23). Here, the terminal authentication unit 52
determines that the requesting terminal 10aa is
authenticated as a terminal having a proper right
15 when the same combination of terminal ID and password
is stored in the terminal authentication management
DB 5002.

[0046]

Then, the sending and receiving unit 51 of the
20 server 50 sends authentication result data including
the result determined by the terminal authentication
unit 52 through the communication network 2 to the
requesting terminal 10aa (step S25). When the
terminal authentication unit 52 determines that the
25 requesting terminal 10aa is authenticated in step

S23, the authentication result data includes the result indicating the terminal 10 is authenticated. However, when the terminal authentication unit 52 determines that the requesting terminal 10aa is not authenticated in step S23, the authentication result data includes the result indicating the terminal 10 is not authenticated. In this embodiment, it is assumed that the terminal authentication unit 52 of the server 50 determines that the requesting terminal 10 10aa is authenticated in step S23 and the authentication result data includes the result indicating the terminal 10 is authenticated.

[0047]

Subsequently, the login requesting unit 13 performs the authentication result determining operation, which will be explained later (step S25-2).

[0048]

When the requesting terminal 10aa receives the authentication result data including the result indicating the terminal 10 is authenticated, the sending and receiving unit 11 sends destination list requesting data for requesting a destination list to the server 50 through the communication network 2 (step S26). The sending and receiving unit 51 of the

server 50 receives the destination list requesting data.

[0049]

The terminal extracting unit 54 searches the
5 destination list management DB 5004 by having the
terminal ID "01aa" of the requesting terminal 10aa,
as a search key, and extracts the terminal ID and the
destination name corresponding to the terminal ID of
the candidate of the destination terminal which is
10 capable of having a communication with the requesting
terminal 10aa (step S27).

[0050]

The terminal extracting unit 54 of the server 50
reads out a record corresponding with the terminal ID
15 of the candidate of the destination terminal from the
terminal management table in the terminal management
DB 5003, and generates "destination list data"
(including a destination list frame, terminal IDs,
and names)" from the record (step S28). The sending
20 and receiving unit 51 of the server 50 sends the
destination list data to the requesting terminal 10aa
(step S29).

[0051]

At the requesting terminal 10aa, the sending and
25 receiving unit 11 receives the destination list data,

and stores the destination list data in the RAM 103 (step S30).

[0052]

The terminal status obtaining unit 55 of the server 50 searches the terminal management DB 5003 by having the terminal IDs ("01ab", "01ba", "01db", ...) of the candidates of destination terminals extracted by the terminal extracting unit 54 as the search keys, and obtains the online status of each of the terminal IDs of the candidates (10ab, 10ba, 10bb,...) of the destination terminals extracted by the terminal extracting unit 54 by reading out the corresponding online statuses (step S31).

[0053]

Subsequently, the sending and receiving unit 51 of the server 50 sends "online status data" including the terminal ID such as "01ab" used as the search key in step S27 and the corresponding online status such as "ON line (communication capable)" or the like to the requesting terminal 10aa through the communication network 2 (step S32).

[0054]

Subsequently, the requesting terminal 10aa stores the online status data received from the server 50 in the RAM 103 (step S33). Therefore, the

requesting terminal 10aa can obtain the current
online statuses of the candidates of destination
terminals such as a terminal 10ab or the like which
is capable of having a communication with the
5 requesting terminal 10aa by receiving the online
status data of each of the terminals.

[0055]

The destination list generating unit 20 of the
requesting terminal 10aa generates a destination list
10 based on the destination list data stored in the RAM
103 and controls a timing when the display control
unit 16 display the destination list on the display
120 (step S34). At this time, the candidates of
destination terminals which are not activated (being
15 off line or the like) may be removed from the
destination list or may be shown as not being
activated in the destination list.

[0056]

Fig. 7 is a drawing showing an example of the
20 destination list generated by the destination list
generating unit 20 in step S34. The destination list
500 includes "icon for showing online status of the
terminal" (just shown as "icon"), "online status data
of the destination terminal" (just shown as "online
25 status data"), and "destination name / terminal ID"

for each of the destination terminals.

[0057]

The name and the terminal ID of the user's terminal are shown at the last line of the destination list 500 in Fig. 7. Further, image data 502 taken by the imaging unit 14 of the user's terminal is shown at the right bottom of the destination list 500. The destination list generating unit 20 displays a screen data including the destination name, the terminal ID and the image of the user's terminal. With such information, users can adjust and prepare the position of the internal camera 112 or the like before calling the destination terminal.

15 **[0058]**

<Start-up operation>

As shown as step S22 in Fig. 6, although the terminal 10aa sends the requesting terminal ID and the password to the server 50, there may be a case where the terminal 10 does not include a UI such as an input unit to receive an input of the password by a user. Further, even if the terminal 10 includes an input unit to receive an input of the password by a user, functionality may be reduced by requesting 25 input of a password from a user. Therefore, the

terminal 10 of the embodiment previously stored the password so that a user is not required to input the password to have the server 50 authenticate the terminal 10.

5 **[0059]**

Fig. 8 is a block diagram of a part of the hardware structure of the terminal 10 shown in Fig. 2. The BIOS ROM 123 (a second recording medium) includes a password storage area (a password storage unit) that stores a password 401, which will be included in the login requesting data to be sent to the server 50, and a BIOS program storage area that includes a BIOS program 402. The BIOS program 402 is performed first after power is turned on.

15 **[0060]**

The HD 122 stores a dedicated boot loader 403, an encode-decode key 404, a requesting terminal ID 405, a screen data 406, a start-up program 407, and a terminal program 408. The start-up program 407 performs starting execution of the terminal program 408. In this embodiment, the terminal ID 405, the screen data 406, the start-up program 407 and the terminal program 408 are stored on the HD 122 of the terminal 10 in encoded manner capable of being
25 decoded by the encode-decode key 404 so that a third

party cannot read the contents without possessing the encode-decode key 404. Therefore, a person having no proper rights cannot use this data of the HD 122 by copying the data or manipulate the data.

5 [0061]

However, the HD 122 includes a master boot record (MBR) at Track 0, only which is in decoded state (unencoded state) in order for the CPU 101 to execute the dedicated boot loader 403 to start the
10 terminal 10. Further, the dedicated boot loader 403 and the encode-decode key 404 are stored at Track 0 in order for the dedicated boot loader 403 to decode areas other than Track 0 of the HD 122. As the encode-decode key 404 is also stored on the HD 122,
15 if the encode-decode key 404 is not encoded, the encoded data stored on the HD 122 may be relatively easily decoded by the encode-decode key 404. Therefore, in this embodiment, the encode-decode key 404 is encoded by the password 401, that is stored in
20 the BIOS ROM 123, which is a recording medium physically different from the HD 122. Alternately, the encode-decode key 404 may be stored on the HD 122 in an encoded manner capable of being decoded by another key, different from the password 401, stored
25 in the BIOS ROM 123. By using another key, different

from the password 401 that is sent to the server 50,
for decoding the encoded encode-decode key 404,
security can be strengthened.

[0062]

5 Although the HD 122 is described as a boot disk
in this embodiment, the same operations are performed
when the CPU 101 is initiated by the flash memory 104
through the SSD 105.

[0063]

10 Fig. 9 and Fig. 10 are explanatory views showing
an example of a method of encoding or decoding the
data stored on the HD 122. The HD 122 includes a
master boot record (MBR) at Track 0. The dedicated
boot loader 403 and the encode-decode key 404 are
15 stored at Track 0. In this embodiment, an encode
program and a decode program may also be stored at
Track 0 of the HD 122. The dedicated boot loader 403
can call the encode program and the encode or decode
program from Track 0. The encode program or the
20 encode or decode program may be encoded or may not be
encoded. When each of the encode program or the
encode or decode program is not encoded, the encode
or decode program may be stored anywhere else such as
the flash memory 104 or the like.

25 **[0064]**

The requesting terminal ID, the start-up program 407, and the terminal program 408 stored in HD 122 are protected by being encoded with the encode-decode key 404. In this embodiment, as the encode-decode key 404 necessary to decode the terminal ID 405, the start-up program 407, and the terminal program 408 is encoded by the password 401, which is not stored on the HD 122, even when others remove the HD 122, encoded data cannot be read out.

10 [0065]

Fig. 11 is a drawing showing an example of the start-up operation of the terminal 10.

[0066]

When a user switches on power (step S501), the CPU 101 starts execution of the BIOS program 402 stored in the BIOS ROM 123 (step S502). Firstly, the BIOS program 402 performs initializations for peripheral devices such as the RAM 103 which requires an initialization and diagnostics of the peripheral devices. The BIOS program 402 then determines a drive or a disk to boot in accordance with the priority of the boot disks stored in the BIOS ROM 123. For example, the priority of the boot disks such as a CD-ROM, a floppy (registered trademark) disk, a hard disk, a USB memory or the like may be

15
20
25

set by a user.

[0067]

Then, the BIOS program 402 searches whether a recording medium is attached to for the boot disk with the higher priority. When the BIOS program 402 finds a recording medium is attached to the searched boot disk, the BIOS program 402 copies a code from the MBR of the boot disk to the RAM 103, and sets a starting address of the code to a program counter of the CPU 101 (step S503). In this embodiment, it is assumed that the boot disk is the HD 122 hereinafter. Then, the CPU 101 moves to control the boot disk after control of the BIOS.

[0068]

The code executed by the CPU 101 is a command to jump to the dedicated boot loader 403. With this, the dedicated boot loader 403 is copied to the RAM 103, and the CPU 101 can execute the dedicated boot loader 403 (step S504). When the MBR has a large enough capacity to store the dedicated boot loader 403, the dedicated boot loader 403 may be stored in the MBR.

[0069]

The dedicated boot loader 403 reads out the password 401 stored in the BIOS ROM 123 (step S505).

As the password 401 is stored in a specific fixed address, the dedicated boot loader 403 reads out the password 401 by setting the address in a register of the CPU 101. The password 401 is then stored in the
5 RAM 103.

[0070]

Subsequently, the dedicated boot loader 403 reads out the encode-decode key 404 stored in a previously fixed address of Track 0 and decodes it by
10 the password 401. The decoded encode-decode key 404 is then stored in the RAM 103.

[0071]

The dedicated boot loader 403 also reads out the encode or decode program stored at Track 0 and
15 develops it in the RAM 103. The encode program is performed by interrupting the CPU 101 writing data in the HD 122 to encode the data by the encode-decode key 404 and the encoded data is stored in the HD 122. The encode or decode program is performed by
20 interrupting the CPU 101 reading data from the HD 122 to decode the data by the encode-decode key 404, and the decoded data is stored in the TD 122.

[0072]

Then, the dedicated boot loader 403 performs a
25 set up operation for encoding or decoding. Fig. 10

shows an example of the set up operation. As the BIOS ROM 123 provides a uniform interface for inputting and outputting of various peripheral devices, a software interruption occurs for using the BIOS ROM 123 every time the CPU 101 accesses the HD 122. Hereinafter, input and output functions by the BIOS ROM 123 are referred to as a BIOS function.

[0073]

The BIOS function 4021 is copied to a predetermined area (640 k byte to 1024 k byte) of the RAM 103 by the BIOS program 402. The BIOS function 4021 is capable of being called by a program executed by the CPU 101. Concretely, The BIOS function 4021 can be called by setting an argument of the BIOS function 4021 in a predetermined register of the CPU 101, and executing a command called "INT". For example, the CPU 101 executes a command starting with "INT13" to access a disk. With this, an interrupt vector of "0x13" is instructed and the CPU 101 performs a function corresponding to the interrupt vector by an internal interruption (software interruption).

[0074]

In this embodiment, the dedicated boot loader 403 writes an interrupt vector of encoding or

decoding at "0x13" to hook an interruption by the interrupt vector of "0x13". This is the set up operation.

[0075]

5 The interrupt vector of encoding or decoding is an interrupt vector for having the CPU 101 execute the encode or decode program. By the set up operation, the interrupt vector of encoding or decoding can hook the software interrupt for reading
10 out, by using the BIOS function 4021 when the CPU 101 accesses the HD 122 so that the decoding operation can be performed. Here, the operation of the CPU 101 when accessing the HD 122 follows the interrupt vectors set in the set up operation. The processing
15 procedure when the CPU 101 accesses the HD 122 is described below.

[0076]

Now, the dedicated boot loader 403 reads out an address where the start-up program 407 is stored on
20 the HD 122, and starts the execution of the start-up program 407 (step S508). As described above, the start-up program 407 is encoded and is capable of being decoded by the encode-decode key 404. It means that the area on the HD 122 where the address of the
25 start-up program 407 is stored may be encoded. The

CPU 101 decodes the area where the address of the start-up program 407 is stored by using the software interrupt for reading out, which is rewritten to the interrupt vector of encoding or decoding as described
5 above.

[0077]

When the operations of steps S501 to S507 are normally performed, the start-up program 407 is activated to decode and activate the terminal program
10 408. At this time, the terminal ID 405 is also decoded. Then, the operations moves to step S22 and the terminal 10 sends the login requesting data to the server 50.

[0078]

15 Among operations of steps S501 to S507, for example, when the dedicated boot loader 403 fails to read out the password 401 (step S505), fails to read out the encode-decode key 404 (step S506), or fails to decode the encode-decode key 404 by the password
20 401 (step S506), the dedicated boot loader 403 cannot decode the area of the HD 122 where the address of the start-up program 407 is stored. As a result, the CPU 101 cannot start the start-up program 407 because the CPU 101 starts execution of the start-up program
25 407 with setting a wrong address in the program

counter. In such a case, the dedicated boot loader stops as the programs are frozen (step S509). It means that the operation is terminated without showing the reason of not activating to a user by an error message or the like. With this operation, the operation is terminated without showing that a password is necessary for the activation or the like to a third party. Therefore, even when the data stored on the HD 122 are copied to other apparatuses or recording mediums, a person having no proper rights cannot use the functions of the terminal 10 or the server 50.

[0079]

[Procedure when CPU accesses HD]

Fig. 12A is a flowchart showing an example of a procedure by which the terminal program 408 writes data to the HD 122.

[0080]

First, the terminal program 408 executes an interrupt instruction that specifies an interrupt vector (S601). In other words, the terminal program 408 sets parameters "0x03" (meaning "write"), the number of sectors to be processed, cylinder number, sector number, head number, and buffer address (the address of RAM 103 where the data to be encoded is

stored) in a predetermined register in CPU 101, and executes "int \$0x13".

[0081]

The CPU 101 refers to the interrupt vector with
5 the number "0x13" by an internal interrupt, but the
interrupt vector for HD122 is hooked by the interrupt
vector of encoding or decoding. Therefore, the CPU
101 starts execution of the encode program stored at
the address indicated by the interrupt vector of
10 encoding or decoding by an internal interrupt.

[0082]

The encode program executed by the CPU 101
encodes data using the decoded encode-decode key 404
stored in RAM 103 (S602).

15 **[0083]**

The CPU 101 stores the encoded data in HD 122
(S603). Specifically, the encode program returns the
disk interrupt vector with number "0x13" to the state
before the setup process, sets the parameter in the
20 register of the CPU 101 again, and executes "int
\$0x13", thereby executing the body of BIOS function
4021, which writes to HD 122.

[0084]

This enables the CPU 101 to write the encoded
25 data to a predetermined sector of the HD 122. In this

manner, any data that the terminal program 408 writes outside of Track 0 of the HD 122 can be written in encoded form.

[0085]

5 Note that after executing "int \$0x13", the encode program prepares for the next write request by returning the interrupt vector with number "0x13" to the state after the setup process.

[0086]

10 Fig. 12B is a flowchart showing an example of a procedure in which the terminal program 408 reads out data from the HD 122.

[0087]

15 First, the terminal program 408 executes an interrupt instruction that specifies an interrupt vector (\$701). In other words, the terminal program 408 sets parameters "0x02" (meaning "read out"), the number of sectors to be processed, cylinder number, sector number, head number, and buffer address (the
20 address of RAM 103 where the read data is stored) in the specified register in CPU 101, and executes "int \$0x13".

[0088]

25 The CPU 101 refers to the interrupt vector with the number "0x13" by an internal interrupt, which is

hooked by the interrupt vector of encoding or
decoding. Therefore, the CPU 101 starts execution of
the decode program stored at the address indicated by
the interrupt vector of encoding or decoding by an
5 internal interrupt.

[0089]

The decode program executed by the CPU 101
returns the disk access interrupt vector with number
"0x13" to the state before the setup process, sets
10 the parameters again, and executes "int \$0x13",
thereby reading out the data of the sector of HD 122
in RAM 103 (S702).

[0090]

The decode program then decodes the data using
15 the encode-decode key 404 stored in the RAM 103 and
stores the decoded data in the RAM 103 (S703). In
this manner, the encoded data can be read out from
the HD 122 and decode the read out data.

[0091]

20 Note that after executing "int \$0x13", the
decode program prepares for the next read request by
returning the interrupt vector with number "0x13" to
the state after the setup process.

[0092]

25 As described above, in the terminal 10 of the

present embodiment, the data in the HD 122 is encoded except for those stored at Track 0, and the password 401 for decoding is stored in the BIOS ROM 123 so that even if a third party removes the contents of the HD 122 by copying the contents of the HD 122 to another apparatus, and the like, the third party cannot use the terminal program 408. This prevents unauthorized use by malicious third parties.

[0093]

10 When the terminal program 408 is started, writing to and reading from the HD 122 executed in step S22 and subsequent processes, but the data written to the HD 122 is encoded. For example, among the login request data sent to the server 50 by the terminal program 408 (login requesting unit 13), the requesting terminal ID 405 is encoded and stored in the HD 122 in step S22. Thus, a third party cannot decode the data in the HD 122 without the password 401 and cannot be authenticated by the server 50.

20 **[0094]**

[Authentication result confirming operation]

 Further, even when the terminal program 408 is normally activated, by performing the authentication result confirming operation (step S25-2), the security can further be strengthened.

[0095]

Fig. 13 is a flowchart showing an example of an authentication result confirming operation.

-When the login requesting unit 13 of the
5 terminal 10aa receives the authentication result data in step S25, the login requesting unit 13 determines whether the authentication result indicates that the terminal 10aa is authenticated by the server 50 to have the proper rights (step S2501).

10 -When the authentication result indicates that the terminal has the proper rights, the operation proceeds to step S26.

-When, on the other hand, the authentication result does not indicate that the terminal has the
15 proper rights, the login requesting unit 13 displays an error message on the display 120 and terminates the operation (step S2502).

[0096]

Fig. 14 is a drawing showing an example of the
20 error message shown on the display 120. As shown in Fig. 13, a message 1401 such as "Authentication failed" and an OK button 1402 which can be pushed by a user are shown. The screen data 406 includes characters and icons for displaying this message 1401
25 and the button 1402. The screen data 406 is stored

on the HD 122 of the terminal 10, and the login requesting unit 13 accesses the HD 122 to have the display control unit 16 display this message 1401 and the like. In this embodiment, the screen data 406
5 may be encoded and stored on the HD 122. In such a case, when the login requesting unit 13 reads out the screen data 406, decoding is performed by a software interrupt.

[0097]

10 When a user pushes the OK button 1402, the login requesting unit 13 can delete the dialog box. Alternatively, the termination operation may be performed right after the user pushes the OK button 1402 to switch off the power so that others having
15 bad intentions cannot use the terminal 10 anymore.

[0098]

As described above, according to the terminal authentication system 100 of the embodiment, data in the HDD 122 of the terminal 10 is stored in an
20 encoded manner and is decoded by the encode-decode key 404, which is decoded with the password 401 stored in the BIOS ROM 123. Therefore, even when others having bad intentions remove the data in the HD 122 from the terminal 10 having a proper right in
25 order to use in other devices, the terminal program

408 cannot be activated. Further, as the authentication of the terminal 10 is performed after the terminal program 408 is activated, the security for the authentication of the terminal 10 can be strengthened.

[0099]

Further, as it is not necessary for a user to input the password 401, security can be maintained even for a small size of the terminal 10 which does not have a UI for inputting the password 401.

[0100]

In addition, since the data written to HD122 is encoded, it is difficult to view the data even if the data is leaked, making it more robust in terms of security. The data written to HD122 is encoded, making it difficult to view even if the data is leaked. Further, although the server 50 for a video conference and the terminal 10 which participates in the video conference are described as an example, the above embodiment can be applied to the server 50 and the terminal 10 which have other various functions.

[Description of the Reference Numbers]

10 terminal
25 11, 51 sending and receiving unit

12 operational input accepting unit
13 login requesting unit
17 start up unit
20 destination list generating unit
5 50 server
52 terminal authentication unit
53 status management unit
54 terminal extracting unit
55 terminal status obtaining unit
10 100 terminal authentication system
101 CPU
103 RAM
120 display
121 HDD
15 122 HD
123 BIOS ROM
401 password
402 BIOS Program
403 dedicated boot loader
20 404 encode-decode key
405 requesting terminal ID
406 screen data
407 start-up program
408 terminal program
25

[Prior art document]

[Patent document]

[0068] Patent Document 1: Japanese Patent No.
3945088

[CLAIMS]

[CLAIM 1]

A data processing apparatus providing a predetermined function by executing a program, the
5 data processing apparatus comprising:
an operational input accepting unit that accepts turning on power;
a first storage unit that encodes execution starting data for starting execution of the program
10 and stores the execution starting data;
a start up unit that obtains an encode-decode key for decoding the execution starting data and decodes the execution starting data with the encode-decode key to start the program when the operational
15 input accepting unit accepts the turning on the power; and
an authentication unit that sends a request for authentication to an external apparatus after the start up unit has started the program, and that
20 starts providing the predetermined function when obtaining an authentication result indicating the apparatus is authenticated from the external apparatus.

25 [CLAIM 2]

The data processing apparatus according to claim 1, further comprising:

a password storage unit that stores a password;
and

5 a second storage unit that stores an encode-decode key for decoding the program, the encode-decode key being encoded by the password,

wherein the first storage unit stores at least a portion of the encode-decode key by encoding the
10 portion of the encode-decode key, and

the start up unit reads out the encode-decode key from the second storage unit and decodes the program using the decoded encode-decode key to start the program.

15

[CLAIM 3]

The data processing apparatus according to claim 2,

wherein the first storage unit that stores
20 apparatus identification data that uniquely identifies the apparatus, and

wherein the authentication unit decodes the apparatus identification data with the encode-decode key, the encode-decode key being decoded with the
25 password, and sends the decoded apparatus

identification data together with the password to an external server, and determines whether or not the apparatus is authenticated, based on authentication result data that determines whether or not the
5 apparatus has been authenticated with the apparatus identification data and the password.

[CLAIM 4]

The data processing apparatus according to claim
10 2 or 3,

wherein after starting the program, the program executes decoding of the read data with the encode-decode key, the encode-decode key being decoded with the password, every time the program executes reading
15 data from the second storage unit.

[CLAIM 5]

The data processing apparatus according to claim
4,

20 wherein the program executes encoding of data subject to writing with the encode-decode key, and subsequently executes writing of the decoded data in the second storage unit every time the program executes writing data to the second storage unit, the
25 encode-decode key being decoded by the password.

[CLAIM 6]

The data processing apparatus according to any one of claims 1 to 5, wherein the predetermined
5 function is to obtain a terminal list including lists of terminals capable of having communication with the apparatus from the external apparatus by sending apparatus identification data that uniquely
identifies the apparatus to the external apparatus,
10 to display the terminal list, and to start a communication with a terminal which is selected from the terminal list.

[CLAIM 7]

15 The data processing apparatus according to any one of claims 1 to 6, wherein the start up unit terminates an operation of starting the program without displaying a message when the start up unit fails to start executing the program.

20

[CLAIM 8]

The data processing apparatus according to any one of claims 3 to 5, wherein when the authentication
result information indicates that the authentication
25 has not been authenticated, the authentication unit

displays an error message indicating authentication failure on the display unit.

[CLAIM 9]

5 The data processing apparatus according to any one of claims 1 to 6, wherein the password is stored in a BIOS ROM.

[CLAIM 10]

10 A program for causing a data processing apparatus for providing a predetermined function to execute a process comprising:
 an operational input accepting step of accepting turning on power;
15 a first storage unit that encodes execution starting data for starting execution of the program and stores the execution starting data;
 a start up step of reading out an execution starting data for starting execution of the program,
20 obtaining an encode-decode key for decoding the execution starting data, and decoding the execution starting data with the encode-decode key to start the program when the turning on the power is accepted in the operational input accepting step; and

an authentication step of sending a request for authentication to an external apparatus after the execution starting data is decoded to start the program in the start up step, and starting providing
5 the predetermined function when obtaining an authentication result indicating the apparatus is authenticated from the external apparatus.

[DOCUMENT NAME] ABSTRACT

[ABSTRACT]

[PROBLEM]

To provide a data processing apparatus capable
5 of being authenticated without requesting a user a
password.

[MEANS TO SOLVE THE PROBLEM]

A data processing apparatus 20 providing a
predetermined function by executing a program 408.
10 The data processing apparatus includes an operational
input accepting unit 12 that accepts turning on
power; a first storage unit 122 that encodes
execution starting data for starting execution of the
program and stores the execution starting data; a
15 start up unit 17 that obtains an encode-decode key
for decoding the execution starting data and decodes
the execution starting data with the encode-decode
key to start the program when the operational input
accepting unit accepts the turning on the power; and
20 an authentication unit 13 that sends a request for
authentication to an external apparatus after the
start up unit has started the program, and that
starts providing the predetermined function when
obtaining an authentication result indicating the
25 apparatus is authenticated from the external

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apparatus.

[Selected Drawing] Fig. 11

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【発明者】
【住所又は居所】 東京都大田区中馬込1丁目3番6号 株式会社リコー内
【氏名】 ボルマ アラン
【発明者】
【住所又は居所】 東京都大田区中馬込1丁目3番6号 株式会社リコー内
【氏名】 金内 志津
【発明者】
【住所又は居所】 東京都大田区中馬込1丁目3番6号 株式会社リコー内
【氏名】 加藤 喜永
【発明者】
【住所又は居所】 東京都大田区中馬込1丁目3番6号 株式会社リコー内
【氏名】 浅井 貴浩
【特許出願人】
【識別番号】 000006747
【氏名又は名称】 株式会社リコー
【代理人】
【識別番号】 100070150
【弁理士】
【氏名又は名称】 伊東 忠彦
【電話番号】 03-5424-2511
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【書類名】 明細書

【発明の名称】 情報処理装置、プログラム

【技術分野】

【0001】

本発明は、サーバとネットワークを介して接続された情報処理装置に関し、特に、サーバの認証を受けることで機能を提供する情報処理装置に関する。

【背景技術】

【0002】

サーバにアクセスした端末が、サーバが提供する機能を利用するネットワークシステムが知られている。この時、サーバは特定のユーザにのみ機能の提供を許可するため、ユーザが入力し端末が送信したID及びパスワードの整合性に基づき、ユーザを認証することが一般的である（例えば、特許文献1参照。）。

【0003】

特許文献1には、PC（Personal Computer）がデータベースの内容をメモリカードに記憶する際、データベースをDBキーで暗号化すると共に、DBキーをユーザに対応した暗号化パスワードで暗号化して、暗号化パスワードと共にメモリカードに記憶させておき、携帯端末がメモリカードからデータベースにアクセスする際、ユーザからパスワードの入力を受け付け、該パスワードをパスワード自体で暗号化し、その暗号化されたパスワードとメモリカードに記憶された暗号化パスワードとが一致する場合に、データベースへのアクセスを許可するデータ検索システムが開示されている。

【発明の概要】

【発明が解決しようとする課題】

【０００４】

ところで、ＰＣや携帯端末のように入力手段や表示手段等のＵＩ（ユーザインターフェース）を備えた機器だけでなく、いわゆる組み込み機器も、サーバが提供する機能を利用してユーザにサービスを提供する利用形態が知られるようになった。組み込み機器は、特定の機能を実現するために計算機システムを搭載しており、家電製品、産業用機器など、いたるところで利用されている。

【０００５】

組み込み機器においても、サーバがサービスの提供を開始する際に、サービスの提供対象か否かを判定するために機器認証を行うことある。ＵＩを有していない組み込み機器の場合、ユーザがＩＤやパスワードを入力することが困難なので、組み込み機器がなんらかの認証情報を不揮発メモリに記憶しておき、この認証情報をサーバに送信することでサーバが認証が成立するか否かを判定することができる。

【０００６】

しかしながら、このような組み込み機器の認証方法では、第三者が組み込み機器内部のプログラムやデータを認証情報ごと複製して他の機器に搭載すると、本来サービスの提供を受けることができない他の機器が、サーバからサービスの提供を受けられるようになってしまうという問題がある。

【０００７】

この問題に対応するために、サーバが組み込み機器にパスワードを要求して、ユーザが正しいパスワードを入力した場合にサーバがサービスの提供を開始することが考えられる。しかしながら、小型の組み込み機器等の場合、パスワードを入力するのに必要なテンキーやキーボード、パスワードの要求メッセージやユーザが入力したパスワードの表示手段を備えていないことがあるので、そもそもユーザにパスワードを要求することすらできない。

【０００８】

本発明は、上記課題に鑑み、ユーザにパスワードを要求することなく認証を受けられる情報処理装置を提供することを目的とする。

【課題を解決するための手段】

【０００９】

上記課題に鑑み、本発明は、プログラムを実行して所定の機能を提供する情報処理装置であって、電源の投入を受け付ける操作入力受付手段と、前記プログラムを実行開始するための実行開始情報（例えば、起動プログラム４０７の先頭アドレス）を暗号化して記憶する第１の記憶手段（例えば、ＨＤ１２２のトラック０以外）と、前記操作入力受付手段が電源の投入を受け付けると、前記実行開始情報を復号する暗号／復号キーを取得して復号し、前記プログラムを起動させる起動手段と、前記起動手段が前記実行開始情報を復号して前記プログラムを起動した後、外部の装置に認証を要求し、認証成立の認証結果を取得した場合に前記機能の提供を開始する認証手段と、を有することを特徴とする。

【発明の効果】

【００１０】

ユーザにパスワードを要求することなく認証を受けられる情報処理装置を提供することができる。

【図面の簡単な説明】

【００１１】

【図１】 端末認証システムの概略構成図の一例である。

【図２】 端末のハードウェア構成図の一例である。

【図３】 サーバのハードウェア構成図の一例である。

【図４】 端末認証システムの機能ブロック図の一例である。

【図５】 端末認証管理テーブル、端末管理テーブル、宛先リスト管理テーブルの一例を示す図である。

【図６】 端末の電源投入から宛先リストを表示するまでの手順を示すシーケンス図の一例である。

【図７】 ステップＳ３４で宛先リスト作成部が作成する宛先リストの一例を示す図である。

【図８】 端末のハードウェア構成図の一部の一例である。

【図９】 ＨＤの暗号化・復号方法の概略を説明する図の一例である。

【図１０】 ＨＤの暗号化・復号方法の概略を説明する図の一例である。

【図１１】 端末の起動手順を説明する図の一例である。

【図１２】 アプリケーションプログラムがＨＤにデータを書き出す手順を示すフローチャート図の一例である。

【図１３】 認証結果判定処理の一例を示す図である。

【図１４】 ディスプレイに表示されたエラー表示の例を示す図である。

【発明を実施するための形態】

【００１２】

以下、本発明を実施するための形態について図面を参照しながら説明する。

図1は、本実施形態の端末認証システム100の概略構成図の一例を示す。サーバ50と端末10が通信ネットワーク2を介して接続されている。端末10はどのような機器でもよいが、一例として 프로젝터를搭載した情報処理装置を図示した。なお、端末10にはディスプレイ120が接続されている。サーバ50は、端末10を認証したり、種々のデータを送信したり、端末10に記憶されたプログラムをアップデートするなどの様々なサービスを提供する。

【0013】

端末1～nは端末10と同じ機能の情報処理装置でもよいし、異なる機能の情報処理装置でもよい。端末10と端末1～nの1つ以上は、サーバ50を介して互いにデータを送受信することができる。

【0014】

通信ネットワーク2は、社内のLAN、LAN同士を広域イーサネット（登録商標）やIP-VPN等を介して接続したWAN、又は、ルータを介してLANやWANと接続されたインターネット等である。したがって、社内、事業所間、国別の支社間等で端末10と端末1～nが相互に通信可能である。通信はSSL（Secure Socket Layer）等で秘匿化されていることが好ましい。

【0015】

図2は、端末10のハードウェア構成図の一例を示す。端末10は、端末10全体の動作を制御するCPU（Central Processing Unit）101、IPL（Initial Program Loader）等のCPU101の駆動に用いられるプログラムを記憶したROM（Read Only Memory）102、CPU101のワークエリアとして使用されるRAM（Random Access Memory）103、端末用プログラムや要求元端末IDを記憶するHD122、CPU101の制御にしたがってHD122に対する各種データの読み出し又は書き込みを制御するHDD（Hard Disk Drive）121、映像データ及び音声データ等の各種データを記憶するフラッシュメモリ104、CPU101の制御にしたがってフラッシュメモリ104に対する各種データの読み出し又は書き込みを制御するSSD（Solid State Drive）105、フラッシュメモリ等の記録メディア106に対するデータの読み出し又は書き込み（記憶）を制御するメディアドライブ107、端末10の宛先を選択する場合などに操作される操作ボタン108、端末10の電源のON/OFFを切り換えるための電源スイッチ109、通信ネットワーク2を利用してデータ伝送をするためのネットワークI/F（Interface）111、ハードウェアとの最も低レベルの入出力を行うためのプログラムが格納されたBIOS ROM123を備えている。

【0016】

また、端末10は、CPU101の制御に従って被写体を撮像して画像データを得る内蔵型のカメラ112、このカメラ112の駆動を制御する撮像素子I/F113、音声を入力する内蔵型のマイク114、音声 outputsする内蔵型のスピーカ115、CPU101の制御に従ってマイク114及びスピーカ115との間で音声信号の入出力を処理する音声入出力I/F116、CPU101の制御に従って外付けのディスプレイ120に画像データを伝送するディスプレイI/F117、各種の外部機器を接続するための外部機器接続I/F118、及び上記各構成要素を電氣的に接続するためのアドレスバスやデータバス等のバスライン110を備えている。

【0017】

ディスプレイ120は、被写体の画像や操作アイコン等を表示する液晶や有機ELによって構成された表示部である。タッチパネルを搭載することができる。また、ディスプレイ120は、ケーブル120cによってディスプレイI/F117に接続される。このケーブル120cは、アナログRGB（VGA）信号用のケーブルであってもよいし、コンポーネントビデオ用のケーブルであってもよいし、HDMI（High-Definition Multimedia Interface）やDVI（Digital Video Interactive）信号用のケーブルであってもよい。

【0018】

カメラ112は、レンズや、光を電荷に変換して被写体の画像（映像）を電子化する固体撮像素子を含み、固体撮像素子として、CMOS（Complementary Metal Oxide Semiconductor）や、CCD（Charge Coupled Device）等が用いられる。

【0019】

外部機器接続I/F118には、USB（Universal Serial Bus）ケーブル等によって、外付けカメラ、及び外付けスピーカ等の外部機器がそれぞれ接続可能である。外付けカメラが接続された場合には、CPU101の制御に従って、内蔵型のカメラ112に優先して、外付けカメラが駆動する。同じく、外付けマイクが接続された場合や、外付けスピーカが接続された場合には、CPU101の制御に従って、それぞれが内蔵型のマイク114や内蔵型のスピーカ115に優先して、外付けマイクや外付けスピーカが駆動する。

【0020】

なお、記録メディア106は、端末10に対して着脱自在な構成となっている。また、CPU101の制御にしたがってデータの読み出し又は書き込みを行う不揮発性メモリであれば、フラッシュメモリ104に限らず、EEPROM（Electrically Erasable and Programmable ROM）等を用いてもよい。

【0021】

更に、端末用プログラムは、インストール可能な形式又は実行可能な形式のファイルで、上記記録メディア 106 等の、コンピュータで読み取り可能な記録媒体に記録して流通させるようにしてもよい。また、上記端末用プログラムは、HD 122 ではなく ROM 102 に記憶させるようにしてもよい。

【0022】

図3は、サーバ50のハードウェア構成図の一例である。サーバ50は、サーバ全体の動作を制御するCPU 201、IPL等のCPU 201の駆動に用いられるプログラムを記憶したROM 202、CPU 201のワークエリアとして使用されるRAM 203、サーバ用プログラム等の各種データを記憶するHD 204、CPU 201の制御にしたがってHD 204に対する各種データの読み出し又は書き込みを制御するHDD (Hard Disk Drive) 205、フラッシュメモリ等の記録メディア 206に対するデータの読み出し又は書き込み（記憶）を制御するメディアドライブ 207、カーソル、メニュー、ウィンドウ、文字、又は画像などの各種情報を表示するディスプレイ 208、通信ネットワーク 2 を利用してデータ伝送をするためのネットワーク I/F 209、文字、数値、各種指示などの入力のための複数のキーを備えたキーボード 211、各種指示の選択や実行、処理対象の選択、カーソルの移動などを行うマウス 212、着脱可能な記録媒体の一例としてのCD-ROM (Compact Disc Read Only Memory) 213に対する各種データの読み出し又は書き込みを制御するCD-ROMドライブ 214、及び、各構成要素を電氣的に接続するためのアドレスバスやデータバス等のバスライン 210を備えている。

【0023】

なお、サーバ用プログラムは、インストール可能な形式又は実行可能な形式のファイルで、上記記録メディア 206 やCD-ROM 213等のコンピュータで読み取り可能な記録媒体に記録して流通させるようにしてもよい。また、サーバ用プログラムは、HD 204ではなくROM 202に記憶されるようにしてもよい。

【0024】

<端末の機能構成>

図4は、端末認証システム100の機能ブロック図の一例である。端末10は、送受信部11、ログイン要求部13、音声入力部15a、音声出力部15b、宛先リスト作成部20、起動部17、操作入力受付部12、撮像部14、及び、表示制御部16、を有している。これら各部は、図3に示されている各構成要素のいずれかが、HD 122からRAM 103上に展開された端末用プログラムを実行したCPU 101からの命令によって動作することで実現される機能、又は有効になる手段である。

【0025】

端末10の送受信部11は、CPU 101からの命令、及び、ネットワーク I/F 111によって実現され、通信ネットワーク 2 を介して他の端末、装置又はサーバ50と各種データ（または情報）の送受信を行う。

【0026】

操作入力受付部12は、CPU 101からの命令、操作ボタン108及び電源スイッチ109によって実現され、ユーザによる各種入力を受け付ける。例えば、ユーザが、電源スイッチ109をONにすると、操作入力受付部12が電源ONを受け付けて、電源から各部に電力を供給する。

【0027】

ログイン要求部13は、CPU 101からの命令によって実現され、電源スイッチ109のONの操作を契機として、送受信部11から通信ネットワーク 2 を介してサーバ50にログイン要求情報、要求元端末ID及び、要求元端末（端末10aa）の現時点のIPアドレスを自動的に送信する。

【0028】

撮像部14は、CPU 101からの命令、カメラ112及び撮像素子 I/F 113によって実現され、被写体を撮像して、この撮像して得た画像データを出力する。

【0029】

音声入力部15aは、CPU 101からの命令、及び、音声入出力 I/F 116によって実現され、マイク 114によってユーザの音声信号が音声信号に変換された後、この音声信号に係る音声データを入力する。音声出力部15bは、CPU 101からの命令、及び、音声入出力 I/F 116によって実現され、音声データに係る音声信号をスピーカに出力し、スピーカ 115から音声を出力させる。

【0030】

表示制御部16は、CPU 101からの命令、及び、ディスプレイ I/F 117によって実現され、外付けのディスプレイ 120に対して画像データを送信するための制御を行う。

【0031】

宛先リスト作成部20は、サーバ50から受信した、後述の宛先リスト情報及び各宛先候補としての端末10の状態情報に基づいて、図7のような宛先リストの作成及び更新を行う。

【0032】

なお、本実施形態の端末IDは、それぞれ端末10を一意に識別するために使われる言語、文字、記号、又は各種のしるし等の識別情報を示す。また、端末ID及び中継装置IDは、言語、文字、記号、及び各種のしるしのうち、少なくとも2つが組み合わされた識別情報であってもよい。

起動部17は、操作入力受付部12から電源投入が通知されると、端末用プログラムを起動させるまでの一連の起動処理を開始する。

【0033】

＜サーバの機能構成＞

サーバ50は、送受信部51、端末認証部52、状態管理部53、端末抽出部54、及び、端末状態取得部55を有している。これら各部は、図3に示されている各構成要素のいずれかが、HD204からRAM203上に展開されたサーバ用プログラムに従ったCPU201からの命令によって動作することで実現される機能又は有効になる手段である。また、HD204には、端末認証管理DB5002、端末管理DB5003、及び、宛先リスト管理DB5004が構築されている。

【0034】

（端末認証管理テーブル）

図5（a）は、端末認証管理DB5002に記憶されている端末認証管理テーブルの一例を示す図である。端末認証管理テーブルには、サーバ50によって管理される全ての端末10の各端末IDに対応づけて、各パスワードが関連付けられて管理される。例えば、図5（a）に示されている端末認証管理テーブルでは、端末10aaの端末IDは「01aa」で、パスワードは「aaaa」であることが示されている。

【0035】

（端末管理テーブル）

図5（b）は端末管理DB5003に記憶されている端末管理テーブルの一例を示す図である。端末管理テーブルでは、各端末10の端末ID毎に、各端末10を通信の宛先とした場合の宛先名、各端末10の稼動状態、後述のログイン要求情報がサーバ50で受信された受信日時、及び、端末10のIPアドレスが関連付けられて管理される。

【0036】

（宛先リスト管理テーブル）

図5（c）は、宛先リスト管理DB5004に記憶されている宛先リスト管理テーブルの一例を示す図である。宛先リスト管理テーブルでは、テレビ会議における通話の開始を要求する要求元端末の端末ID（以下、要求元端末IDという場合がある）に対応づけて、宛先端末の候補として登録されている宛先端末の端末IDが全て関連付けられて管理される。例えば、端末IDが「01aa」である要求元端末（端末10aa）からテレビ会議における通話の開始を要求することができる宛先端末の候補が、端末IDにより登録されている。

【0037】

送受信部51は、CPU201からの命令、及び、ネットワーク1/F209によって実行され、通信ネットワーク2を介して端末10、装置又はシステムと各種データ（または情報）の送受信を行う。

【0038】

端末認証部52は、CPU201からの命令によって実現され、送受信部51を介して受信されたログイン要求情報に含まれている要求元端末ID及びパスワードを検索キーとし、端末認証管理DB5002に同一の端末ID及びパスワードが管理されているかを判断することによって端末認証を行う。

【0039】

状態管理部53は、CPU201からの命令によって実現され、ログイン要求してきた要求元端末の稼動状態を管理すべく、端末管理DB5003に、この要求元端末の端末ID、稼動状態、サーバ50でログイン要求情報が受信された受信日時、及び、要求元端末のIPアドレスを関連付けて記憶して管理する。また、状態管理部53は、ユーザが端末10の電源スイッチ109をONの状態からOFFにすることで、端末10から送られてきた、電源をOFFする旨の状態情報に基づいて、端末管理DB5003のONラインを示す稼動状態をOFFラインに変更する。

【0040】

端末抽出部54は、CPU201からの命令によって実現され、ログイン要求した要求元端末の端末IDをキーとして、宛先リスト管理DB5004を検索し、要求元端末と通話することができる宛先端末の候補の端末IDを読み出すことで、端末IDを抽出する。また、端末抽出部54は、ログイン要求してきた要求元端末の端末IDをキーとして、宛先リスト管理DB5004を検索し、要求元端末の端末IDを宛先端末の候補として登録している他の要求元端末の端末IDも抽出する。

【0041】

端末状態取得部55は、端末抽出部54によって抽出された宛先端末の候補の端末IDを検索キーとして、端末管理DB5003を検索し、端末抽出部54によって抽出された端末ID毎に稼動状態を読み出す。これにより、端末状態取得部55は、ログイン要求してきた要求元端末と通話することができる宛先端末の候補の稼動状態を取得することができる。また、端末状態取得部55は、端末抽出部54によって抽出された端末ID

Dを検索キーとして、端末管理DB5003を検索し、ログイン要求してきた要求元端末の稼動状態も取得する。

【0042】

〔電源投入から宛先リスト表示まで〕

図6は、端末10の電源投入から宛先リストを表示するまでの手順を示すシーケンス図の一例である。電源投入される端末10を端末10aaとする。

【0043】

まず、ユーザが、電源スイッチ109をONにすると、操作入力受付部12が電源ONを受け付けて、電源をONにする（S21）。この後、起動部17は後述する起動処理を実行する（S21-2）。

【0044】

起動処理が完了すると、ログイン要求部13は、電源スイッチ109のONの操作を契機とし、送受信部11から通信ネットワーク2を介してサーバ50に、ログイン要求を示すログイン要求情報を自動的に送信する（S22）。このログイン要求情報には、要求元としての自端末である端末10aaを識別するための要求元端末ID、及び、パスワードが含まれている。このパスワードはBIOSROM123に記憶されているパスワードであり、ユーザが入力する必要がない点が特徴の1つになっている。なお、端末10aaからサーバ50へログイン要求情報が送信される際は、受信側であるサーバ50は、送信側である端末10aaのIPアドレスを把握することができる。

【0045】

次に、サーバ50の端末認証部52は、送受信部51を介して受信したログイン要求情報に含まれている要求元端末ID及びパスワードを検索キーとして、端末認証管理DB5002に同一の端末ID及びパスワードの組が管理されているかを判断することによって端末認証を行う（S23）。

【0046】

そして、サーバ50の送受信部51は、端末認証部52によって得られた認証結果が示された認証結果情報を、通信ネットワーク2を介して、ログイン要求してきた要求元端末（端末10aa）に送信する（S25）。本実施形態では、端末認証部52によって正当な利用権限を有する端末であると判断されたものとする。

【0047】

この後、ログイン要求部13は後述する「認証結果判定処理」を実行する（S25-2）。

【0048】

要求元端末（端末10aa）では、正当な利用権限を有する端末10であると判断された結果が示された認証結果情報を受信すると、送受信部11が通信ネットワーク2を介してサーバ50へ、宛先リストを要求する旨が示された宛先リスト要求情報を送信する（S26）。これにより、サーバ50の送受信部51は、宛先リスト要求情報を受信する。

【0049】

端末抽出部54は、ログイン要求した要求元端末（端末10aa）の端末ID「01aa」を検索キーとして、宛先リスト管理DB5004を検索し、要求元端末（端末10aa）と通話することができる宛先端末の候補の端末IDと、この端末IDに対応する宛先名を読み出すことによって抽出する（S27）。

【0050】

サーバ50の端末抽出部54は、端末管理テーブルから候補の端末IDに対応づけられたレコードを読み出し、レコードから、「宛先リスト情報（宛先リスト枠、端末ID、宛先名）」を生成する（S28）。サーバ50の送受信部51は、宛先リスト情報を要求元端末（端末10aa）に送信する（S29）。

【0051】

これにより、要求元端末（端末10aa）では、送受信部11が宛先リスト情報を受信し、RAM103へ宛先リスト情報を記憶する（S30）。

【0052】

また、サーバ50の端末状態取得部55は、上記端末抽出部54によって抽出された宛先端末の候補の端末ID（「01ab」、「01ba」、「01db」、…）を検索キーとして、端末管理DB5003を検索し、端末抽出部54によって抽出された端末ID毎に、対応する稼動状態を読み出すことで、宛先候補としての端末（10ab、10ba、10bb、…）の各稼動状態を取得する（ステップS31）。

【0053】

次に、送受信部51は、ステップS27で使用された検索キーとしての端末ID「01ab」と、対応する宛先端末（端末10ab）の稼動状態「ONライン（通話可能）」とが含まれた「端末の状態情報」を、通信ネットワーク2を介して要求元端末（端末10aa）に送信する（ステップS32）。

【0054】

次に、要求元端末（端末10aa）は、順次、サーバ50から受信した端末10の状態情報をRAM103に記憶する（ステップS33）。よって、要求元端末（端末10aa）は、上記各端末の状態情報を受信する

ことで、要求元端末（端末１０ａａ）と通話することができる宛先端末の候補である端末１０ａｂ等の現時点のそれぞれの稼動状態を取得することができる。

【００５５】

次に、要求元端末（端末１０ａａ）の宛先リスト作成部２０は、ＲＡＭ１０３に記憶されている宛先リスト情報に基づいて、宛先リストを作成すると共に、表示制御部１６が、ディスプレイ１２０に対して、宛先リストを表示するタイミングを制御する（Ｓ３４）。この時、起動していない宛先候補は宛先リストから除外することや起動していない旨を宛先リストに反映させることができる。

【００５６】

図７は、ステップＳ３４で宛先リスト作成部２０が作成する宛先リストの一例を示す図である。１つの宛先毎に、「端末の状態を示すアイコン」、「宛先状態情報」、「宛先名（上段）／端末ＩＤ（下段）」が表示されている。

【００５７】

なお、図７の宛先リストの最後の行は、自端末の宛先名や端末ＩＤが表示される。また、最後の行の右端には自端末の撮像部１４が撮影した映像が表示される。宛先リスト作成部２０は、画面データに自端末の宛先名、端末ＩＤ及び映像を配置して表示する。このように映像を表示させておくことで、自端末が相手呼び出す前に、ユーザが撮影位置を調整して、準備しておくことができる。

【００５８】

<起動処理>

図６のＳ２２に示すように端末１０ａａは要求元端末ＩＤとパスワードをサーバ５０に送信するが、端末１０がパスワードの入力手段を有していない場合がある。また、端末１０がパスワードの入力手段を有していても、ユーザにパスワードの入力を要求すると操作性が低下するおそれがある。そこで、本実施形態の端末１０は予めパスワードを記憶しておくことで、ユーザがパスワードを入力しなくても、端末１０がサーバ５０による認証を受けられるようになっている。

【００５９】

図８は、端末１０のハードウェア構成図の一部を示す。この図８は、図２から起動処理に使用されるブロックを抜粋したものである。ＢＩＯＳ ＲＯＭ１２３には電源投入後の最初に実行されるＢＩＯＳプログラム４０２及びログイン要求情報としてサーバ５０に送信されるパスワード４０１が記憶されている。

【００６０】

ＨＤ１２２には専用ブートローダ４０３、暗号／復号キー４０４、要求元端末ＩＤ４０５、画面データ４０６、起動プログラム４０７及び端末プログラム４０８が記憶されている。ただし、端末１０のＨＤ１２２に保存されているデータは第三者が解読できないように暗号化技術により暗号化されている。このため、悪意のある第三者はＨＤ１２２の内容をコピーしてデータを利用したり、改ざんすることはできない。

【００６１】

しかしながら、ＣＰＵ１０１が端末１０を起動させるための専用ブートローダ４０３を実行できるように、ＭＢＲ(Master Boot Record)が含まれるトラック０だけは復号状態（平文状態）となっている。また、専用ブートローダ４０３がＨＤ１２２のトラック０以外を復号できるように、暗号／復号キー４０４もトラック０に記憶されている。暗号／復号キー４０４が平文のままだと比較的容易にＨＤ１２２のデータを復号可能になるため、暗号／復号キー４０４はパスワード４０１により暗号化されている。なお、パスワード４０１でなくＢＩＯＳ ＲＯＭ１２３に記憶された別のキーにより暗号化されていてもよい。サーバ５０に送信されるパスワード４０１と、暗号／復号キー４０４を復号するキーを別々にすることでセキュリティ強度を高くすることができる。

【００６２】

なお、本実施形態ではＨＤ１２２を起動ディスクとして説明するが、ＣＰＵ１０１がＳＳＤ１０５を介してフラッシュメモリ１０４から起動する場合も同様である。

【００６３】

図９、１０は、ＨＤ１２２の暗号・復号方法の概略を説明する図の一例である。暗号化されていないトラック０にはＭＢＲがあり、トラック０には専用ブートローダ、暗号／復号キー４０４、が記憶されている。なお、専用ブートローダはトラック０から暗号化プログラムと復号プログラムを呼び出すことができる。暗号化プログラムと復号プログラムは暗号化されていなければフラッシュメモリ１０４などどこに記憶されていてもよい。

【００６４】

ＨＤ１２２に記憶された、要求元端末ＩＤ、起動プログラム４０７、端末用プログラム４０８は暗号／復号キー４０４により暗号化されていることで保護されている。ＨＤ１２２の復号に必要な暗号／復号キー４０４は、パスワード４０１により暗号化されているので、仮に、第三者がＨＤ１２２だけを取り出してもデータを読み出すことはできない。

【００６５】

図11は、端末10の起動手順を説明する図の一例である。

【0066】

ユーザが電源をオンにすると（S501）、CPU101はBIOS ROM123に保存されているBIOSプログラム402の実行を開始する（S502）。まず、BIOSプログラム402は、RAM103など初期化が必要な周辺機器の初期化と、各周辺機器の診断を行う。そして、BIOS ROM123に記憶されている起動ドライブの優先順位に従って、起動するドライブを決定する。例えば、CD-ROM、フロッピー（登録商標）ディスク、ハードディスク、又は、USBメモリ等からユーザにより起動の優先順位が設定されている。

【0067】

次に、BIOSプログラム402は、優先順位の高い起動ドライブからメディアが装着されているか否かを検索して、起動デバイスにメディアが装着されていれば、そのメディアのMBRにあるコードをRAM103へコピーすると共に、CPU101のプログラムカウンタにコードの先頭アドレスを設定する（S503）。本実施形態では、起動ドライブはHD122であるとして説明する。これにより、CPU101はBIOS制御から、ディスク制御へと移行する。

【0068】

CPU101が実行するコードは、専用ブートローダ403へジャンプする命令である。これにより、専用ブートローダ403がRAM103へコピーされ、CPU101が専用ブートローダ403を実行することができる（S504）。MBRに直接、専用ブートローダ403を記憶しないのは、MBRの容量が小さく、専用ブートローダ403を格納することが困難なためであるので、このような制約がなければMBRに直接、専用ブートローダ403を記憶してもよい。

【0069】

専用ブートローダ403は、まずBIOS ROM123に記憶されているパスワード401を読み出す（S505）。パスワード401は固定のアドレスに記憶されているので、専用ブートローダ403はCPU101のレジスタに該アドレスを設定してパスワード401を読み出す。パスワード401はRAM103に記憶される。

【0070】

次に、専用ブートローダ403は、トラック0の予め固定のアドレスに保存されている暗号／復号キー404を読み出し、さらにパスワード401で復号する（S506）。復号された暗号／復号キー404はRAM103に記憶される。

【0071】

なお、専用ブートローダ403は、Track0に記憶されている暗号化プログラムと復号プログラムをRAM103に読み込む。暗号化プログラムは、CPU101がHD122にデータを書き込む割り込みにより実行され、暗号化プログラムは暗号／復号キー404を用いてデータを暗号化してHD122に記憶する。復号プログラムは、CPU101がHD122からデータを読み出す割り込みにより実行され、復号プログラム暗号／復号キー404を用いてデータを復号する。

【0072】

次に、専用ブートローダ403は、暗号／復号のためのセットアップ処理を行う。

図10は、セットアップ処理を説明するための図の一例である。BIOS ROM123は種々の周辺機器の入出力に対し統一したインターフェースを提供するので、CPU101がHD122へアクセスするたびに、BIOS ROM123を利用するためのソフトウェア割り込みが発生する。以下、BIOS ROM123が提供する入出力機能をBIOSファンクションと称す。

【0073】

BIOSファンクション4021は、BIOSプログラム402によりRAM103の所定の領域（640kバイト～1024kバイト）にコピーされる。BIOSファンクション4021は、CPU101が実行するプログラムから呼び出せるようになっている。具体的には、CPU101の所定のレジスタにBIOSファンクション4021の引数を設定し、「INT」という命令を実行することでBIOSファンクション4021を呼び出すことができる。例えば、ディスクへのアクセスのためCPU101は「INT13」で始まる命令を実行する。これにより「0x13」番の割り込みベクタが指示されると、CPU101は内部割り込み（ソフトウェア割り込み）により割り込みベクタに対応するファンクション本体を実行する。

【0074】

本実施形態では、専用ブートローダ403は「0x13」番の割り込みベクタへの割り込みをフックするため、「0x13」番に暗号化・復号の割り込みベクタを書き込む。これがセットアップ処理である。

【0075】

暗号化・復号の割り込みベクタは、CPU101が暗号化プログラム又は復号プログラムを実行するための割り込みベクタである。セットアップ処理により、CPU101がHD122にアクセスする際、BIOSファンクション4021を利用した読み取り・書き込みのソフトウェア割り込みを、暗号化・復号の割り込みベ

クタがフックすることができ、暗号化処理・復号処理ができるようになる。CPU 101がHD 122にアクセスする際の処理手順については後述する。

【0076】

次に、専用ブートローダ403は、起動プログラム407を実行するために起動プログラム407が保存されているアドレスをHD 122から読み出し、起動プログラム407の実行を開始する(S508)。この起動プログラム407は、端末用プログラム408を起動するためのプログラムである。なお、HD 122において起動プログラム407のアドレスが記憶された領域は暗号化されているので、CPU 101は読み出しに対する割り込みの発生を利用して、起動プログラム407のアドレスの復号処理を実行する。

【0077】

ここで、S501～S507までの処理が正常に実行されれば、起動プログラム407が起動し、端末用プログラム408を起動して、端末10はS22のログイン要求情報をサーバ50に送信する。

【0078】

S501～S507までの処理のうち、専用ブートローダ403がパスワード401の読み出しに失敗したり(S505)、暗号／復号キー404の読み出しやパスワード401による復号に失敗すると(S506)、専用ブートローダ403は起動プログラム407のアドレスを正しく復号できない。この結果、CPU 101は誤った起動プログラム407のアドレスをプログラムカウンタに設定して実行を開始するので、起動プログラム407を実行することができない。この場合、プログラムが暴走又はフリーズするなどにより、専用ブートローダが自動停止する(S509)。すなわち、起動しない理由をエラーメッセージなどでユーザに通知せずに処理が終了する。こうすることで、第三者に、起動にはパスワードが必要であることなどを知らせることを防止できる。したがって、HD 122のデータが他の機器にコピーされるなどしても、利用権限のない第三者が端末10の機能を利用したりサーバ50の機能を利用することを防止できる。

【0079】

〔CPUがHDにアクセスする際の処理手順〕

図12(a)は、端末用プログラム408がHD 122にデータを書き出す手順を示すフローチャート図の一例である。

【0080】

まず、端末用プログラム408は、割り込みベクタを指定する割り込み命令を実行する(S601)。すなわち、端末用プログラム408は、CPU 101の所定のレジスタに、「0x03(書き込みを意味する)」、処理するセクタ数、シリンダ番号、セクタ番号、ヘッド番号、バッファアドレス(暗号化対象のデータが記憶されているRAM 103のアドレス)のパラメータを設定して、「int \$0x13」を実行する。

【0081】

CPU 101は内部割り込みにより「0x13」番の割り込みベクタを参照するが、HD 122用の割り込みベクタは暗号化・復号の割り込みベクタによりフックされている。したがって、CPU 101は内部割り込みにより暗号化・復号の割り込みベクタが示すアドレスに記憶されている暗号化プログラムの実行を開始する。

【0082】

CPU 101が実行する暗号化プログラムは、RAM 103に記憶されている復号済みの暗号／復号キー404を用いて、データを暗号化する(S602)。

【0083】

暗号化したらCPU 101は、暗号化されたデータをHD 122に記憶する(S603)。具体的には、暗号化プログラムが、「0x13」番のディスク用の割り込みベクタをセットアップ処理の前の状態に戻し、再度、CPU 101のレジスタにパラメータを設定して「int \$0x13」を実行することで、HD 122への書き込みを行うBIOSファンクション4021の本体を実行する。

【0084】

これにより、CPU 101は、暗号化されたデータを、HD 122の所定のセクタに書き込むことができる。このようにして、端末用プログラム408がHD 122のトラック0以外に書き込むデータはすべて暗号化して書き込むことができる。

【0085】

なお、「int \$0x13」を実行した後、暗号化プログラムは、「0x13」番の割り込みベクタを、セットアップ処理後の状態に戻すことで、次の書き込み要求に備える。

【0086】

図12(b)は、端末用プログラム408がHD 122からデータを読み出す手順を示すフローチャート図の一例である。

【0087】

まず、端末用プログラム408は、割り込みベクタを指定する割り込み命令を実行する(S701)。すなわち、端末用プログラム408は、CPU 101の所定のレジスタに、「0x02(読み出しを意味する)」、処理

するセクタ数、シリンダ番号、セクタ番号、ヘッド番号、バッファアドレス（読み出したデータを記憶するRAM103のアドレス）のパラメータを設定して、「int \$0x13」を実行する。

【0088】

CPU101は内部割込みにより「0x13」番の割り込みベクタを参照するが、この割り込みベクタは暗号化・復号の割り込みベクタによりフックされている。したがって、CPU101は内部割込みにより暗号化・復号の割り込みベクタが示すアドレスに記憶されている復号プログラムの実行を開始する。

【0089】

CPU101が実行する復号プログラムは、「0x13」番のディスクアクセス用の割り込みベクタをセットアップ処理の前の状態に戻し、再度、パラメータを設定して「int \$0x13」を実行することで、RAM103に、HD122のセクタのデータを読み出す（S702）。

【0090】

そして、復号プログラムは、RAM103に記憶されている暗号／復号キー404を用いて、データを復号しRAM103に記憶する（S703）。このようにして、暗号化されたデータをHD122から読み出して復号することができる。

【0091】

なお、「int \$0x13」を実行した後、復号プログラムは、「0x13」番の割り込みベクタをセットアップ処理後の状態に戻すことで、次の読み出し要求に備える。

【0092】

以上説明したように、本実施形態の端末10は、HD122がトラック0を除き暗号化されており、復号するためのパスワード401がBIOS ROM123に記憶されているので、第三者がHD122を他の機器へコピーするなどして中身を取り出しても、端末用プログラム408等を利用することができない。このため、悪意のある第三者による不正な利用を防ぐことができる。

【0093】

また、端末用プログラム408が起動すると、ステップS22以降の処理では、HD122への書き込みやHD122からの読み出しが発生するが、HD122に書き込まれたデータは暗号化されている。例えば、ステップS22において端末用プログラム408（ログイン要求部13）がサーバ50に送信するログイン要求情報のうち要求元端末ID405は暗号化されてHD122に保存されているため、パスワード401がなければ、第三者がHD122のデータを復号できず、サーバ50の認証を受けることができない。

【0094】

〔認証結果判定処理〕

端末用プログラム408が正常に起動しても、認証結果判定処理（S25-2）を設けることにより、セキュリティをさらに強固なものとすることができる。

【0095】

図13は、認証結果判定処理の一例を示す図である。

- ・ステップS25で、ログイン要求部13が認証結果を受信すると、ログイン要求部13はこの結果が正当な利用権限であるか否かを判定する（S2501）。
- ・認証結果が正当な利用権限であれば、処理はステップS26へ進む。
- ・認証結果が不正な利用権限であれば、ログイン要求部13はエラーダイアログをディスプレイ120に表示して処理を停止する（S2502）。

【0096】

図14は、ディスプレイ120に表示されたエラー表示の例を示す図である。図14に示すように、「認証に失敗しました」というメッセージ1401と、ユーザが押下可能なOKボタン1402が表示される。画面データ406はこのダイアログを表示するために必要な文字情報やアイコンなどである。画面データ406は端末10のHD122に記憶されており、ログイン要求部13がHD122にアクセスして表示制御部16に表示を依頼する。この画面データ406についてもHD122で暗号化されているため、ログイン要求部13が画面データ406を読み出す際は、ソフトウェア割込みによる復号処理が行われる。

【0097】

ユーザがOKボタン1402を押下した場合、ログイン要求部13はダイアログを消去する。または、悪意のある第三者に端末10を使用させないために、ユーザがOKボタン1402を押下した場合に、直ちに終了処理を行い、電源を切断してもよい。

【0098】

以上説明したように、本実施形態の端末認証システム100は、端末10のHD122を暗号化しておき、BIOS ROM123に記憶されたパスワード401を利用して起動プログラム407を復号するので、悪意のある第三者が、正当な利用権限をもつ端末10のHD122を取り出して、他の機器で利用しようとしても、端末用プログラム408を起動させることができない。また、端末用プログラム408が起動された後、端末10の認証処理を行わせるようにしているので、端末10の認証をより強固なものとするすることができる。

【００９９】

また、ユーザにパスワード４０１を入力させる必要ないため、パスワード４０１入力のためのＵＩを備えていない小型の端末１０でもセキュリティを保つことができる。

【０１００】

また、ＨＤ１２２に書き込まれたデータは暗号化されているので、データが漏洩しても閲覧は困難であり、セキュリティ的にも強固なものとする事ができる。

また、本実施形態では、テレビ会議のサーバ５０と会議に参加する端末１０とを例にして説明したが、これに限られず、種々のサービスを提供するサーバ５０と、そのサービスを受ける端末１０において適用することができる。

【符号の説明】

【０１０１】

１０	端末
１１、５１	送受信部
１２	操作入力受付部
１３	ログイン要求部
１７	起動部
２０	宛先リスト作成部
５０	サーバ
５２	端末認証部
５３	状態管理部
５４	端末抽出部
５５	端末状態取得部
１００	端末認証システム
１０１	ＣＰＵ
１０３	ＲＡＭ
１２０	ディスプレイ
１２１	ＨＤＤ
１２２	ＨＤ
１２３	ＢＩＯＳ　ＲＯＭ
４０１	パスワード
４０２	ＢＩＯＳプログラム
４０３	専用ブートローダ
４０４	暗号／復号キー
４０５	要求元端末ＩＤ
４０６	画面データ
４０７	起動プログラム
４０８	端末用プログラム

【先行技術文献】

【特許文献】

【０１０２】

【特許文献１】特許３９４５０８８号公報

【書類名】特許請求の範囲

【請求項１】

プログラムを実行して所定の機能を提供する情報処理装置であって、
電源の投入を受け付ける操作入力受付手段と、
前記プログラムを実行開始するための実行開始情報を暗号化して記憶する第１の記憶手段と、
前記操作入力受付手段が電源の投入を受け付けると、前記実行開始情報を復号する暗号／復号キーを取得して復号し、前記プログラムを起動させる起動手段と、
前記起動手段が前記実行開始情報を復号して前記プログラムを起動した後、外部の装置に認証を要求し、認証成立の認証結果を取得した場合に前記機能の提供を開始する認証手段と、
を有することを特徴とする情報処理装置。

【請求項２】

パスワードを記憶するパスワード記憶手段と、
前記パスワードにより暗号化された、前記プログラムを復号するための前記暗号／復号キーを記憶する第２の記憶手段と、

前記第 1 の記憶手段は、前記プログラムの少なくとも一部を暗号化して記憶しており、
前記起動手段は、前記パスワード記憶手段に記憶されている前記パスワードを読み出して、前記第 2 の記憶手段に記憶されている前記暗号／復号キーを復号し、復号した前記暗号／復号キーにより前記プログラムを復号して該プログラムを起動させる、

ことを特徴とする請求項 1 記載の情報処理装置。

【請求項 3】

前記第 1 の記憶手段は、前記認証処理に必要な装置固有情報を暗号化して記憶しており、

前記認証手段は、前記パスワードで復号された前記暗号／復号キーで前記装置固有情報を復号して、前記パスワードと共に外部のサーバに送信し、

前記サーバが前記装置固有情報及び前記パスワードにより認証が成立するか否かを判定した認証結果情報に基づいて、認証が成立したか否かを判定する、

ことを特徴とする請求項 2 記載の情報処理装置。

【請求項 4】

前記プログラムの起動後、前記プログラムは、前記第 2 の記憶手段からデータを読み出す毎に、読み出したデータを前記パスワードで復号された前記暗号／復号キーにより復号する、

ことを特徴とする請求項 2 又は 3 記載の情報処理装置。

【請求項 5】

前記プログラムは前記第 2 の記憶手段にデータを書き込む毎に、書き込み対象のデータを前記パスワードで復号された前記暗号／復号キーにより暗号化した後、前記第 2 の記憶手段に書き込む、

ことを特徴とする請求項 4 記載の情報処理装置。

【請求項 6】

前記機能は、当該情報処理装置の識別情報を外部の装置に送信し、外部の装置から当該情報処理装置が通信可能な端末リストを取得して一覧表示する機能であり、

前記端末リストから端末の選択を受け付けた場合、該端末と通信を開始する機能である、ことを特徴とする請求項 1～5 いずれか 1 項記載の情報処理装置。

【請求項 7】

前記起動手段がプログラムを起動できない場合、メッセージを表示することなく前記プログラムを起動させる処理を終了する、

ことを特徴とする請求項 1～6 いずれか 1 項記載の情報処理装置。

【請求項 8】

前記認証手段は、前記認証結果情報が認証が成立しなかったことを示す場合、表示手段に認証失敗のエラーメッセージを表示する、

ことを特徴とする請求項 3～5 いずれか 1 項記載の情報処理装置。

【請求項 9】

前記パスワードは、BIOS ROMに記憶されている、ことを特徴とする請求項 1～6 いずれか 1 項記載の情報処理装置。

【請求項 10】

プログラムを実行して所定の機能を提供する情報処理装置に、

電源の投入を受け付ける操作入力受付ステップと、

前記操作入力受付ステップにより電源の投入が受け付けられた場合、第 1 の記憶手段から前記プログラムを実行開始するための暗号化された実行開始情報を読み出し、前記実行開始情報を復号する暗号／復号キーを取得して復号し、前記プログラムを起動させる起動ステップと、

前記起動ステップにより前記実行開始情報が復号されプログラムが起動された後、外部の装置に認証を要求し、認証成立の認証結果を取得した場合に前記機能の提供を開始する認証ステップと、

を実行させるプログラム。

【書類名】要約書

【要約】

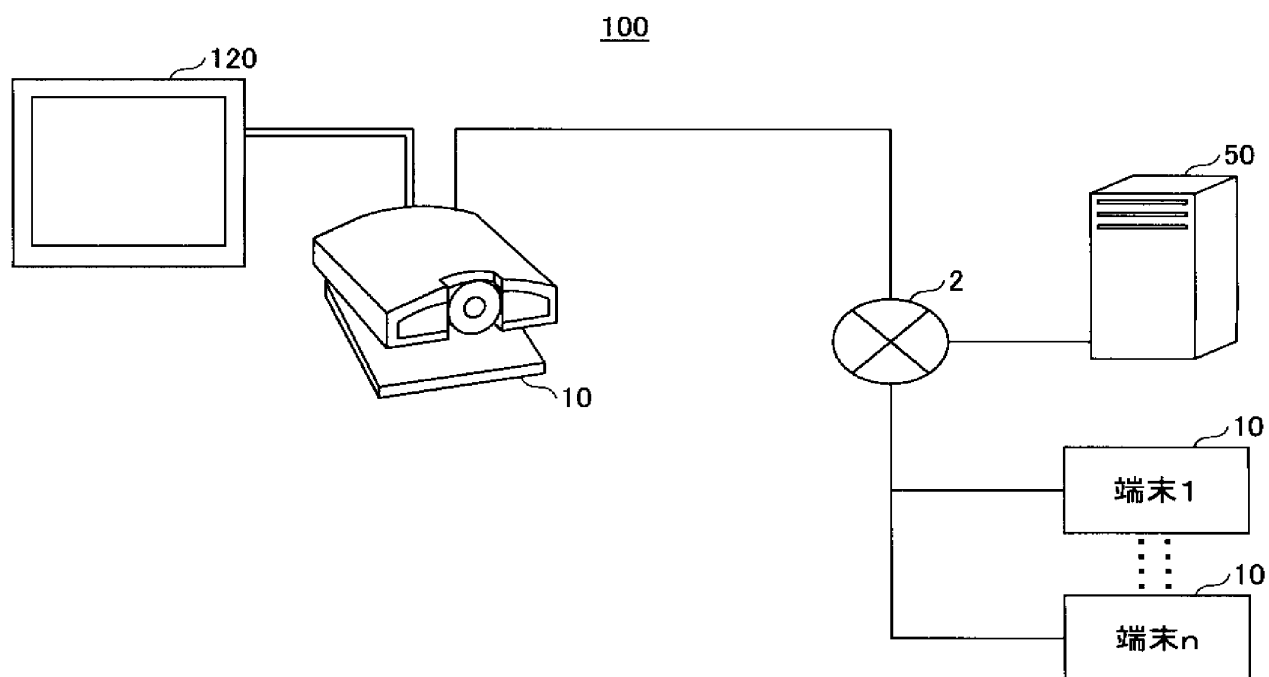
【課題】 ユーザにパスワードを要求することなく認証を受けられる情報処理装置を提供すること。

【解決手段】 プログラム 408 を実行して所定の機能を提供する情報処理装置 10 であって、電源の投入を受け付ける操作入力受付手段 12 と、前記プログラムを実行開始するための実行開始情報を暗号化して記憶する第 1 の記憶手段 122 と、前記操作入力受付手段が電源の投入を受け付けると、前記実行開始情報を復号する暗号／復号キーを取得して復号し、前記プログラムを起動させる起動手段 17 と、前記起動手段が前記実行開始情報を復号して前記プログラムを起動した後、外部の装置に認証を要求し、認証成立の認証結果を取得した場合に前記機能の提供を開始する認証手段 13 と、を有することを特徴とする。

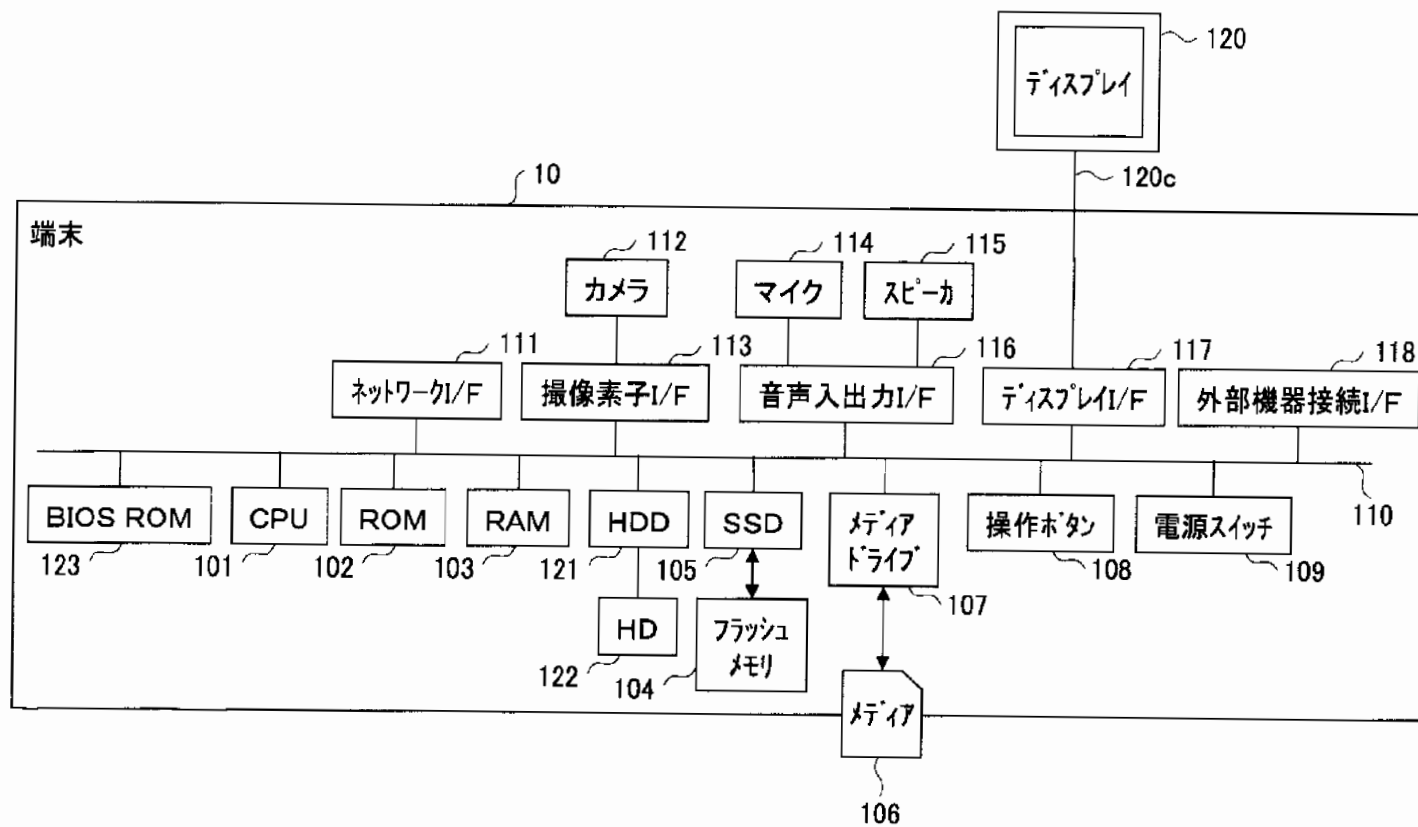
【選択図】 図 11

【書類名】 図面
【図 1】

端末認証システムの概略構成図の一例



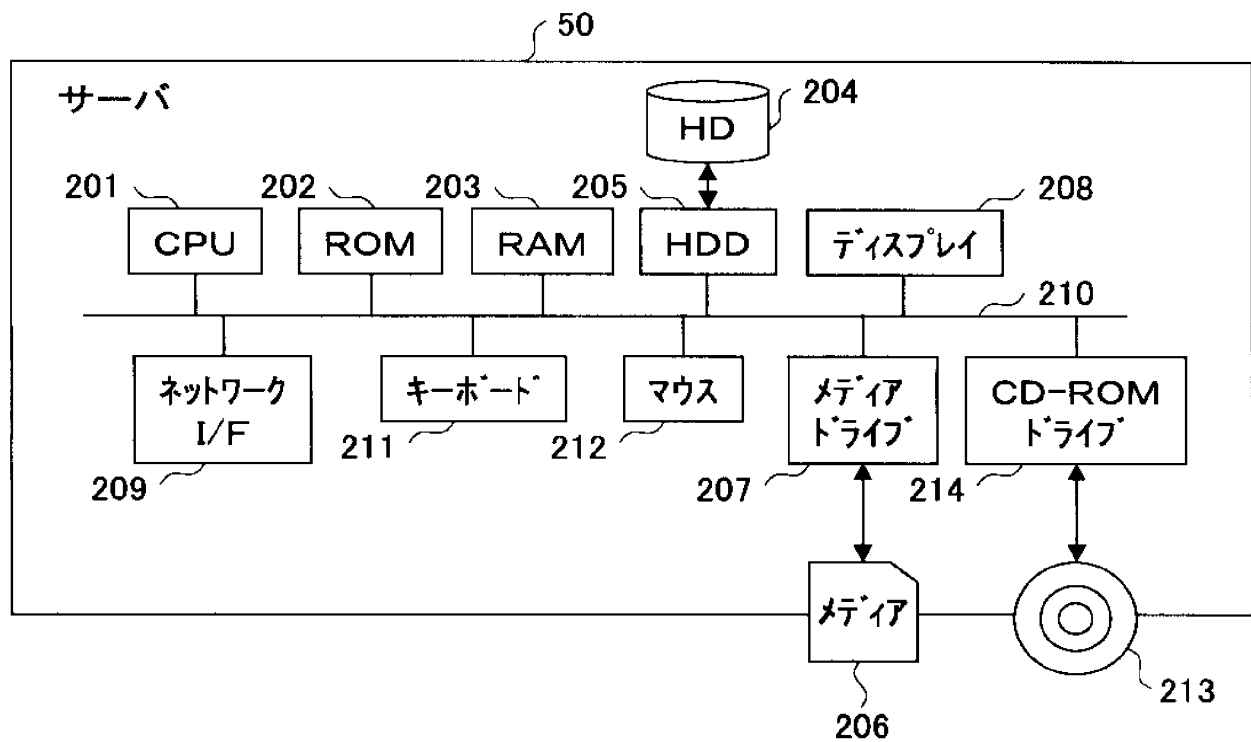
【図 2】



端末のハードウェア構成図の一例

【図3】

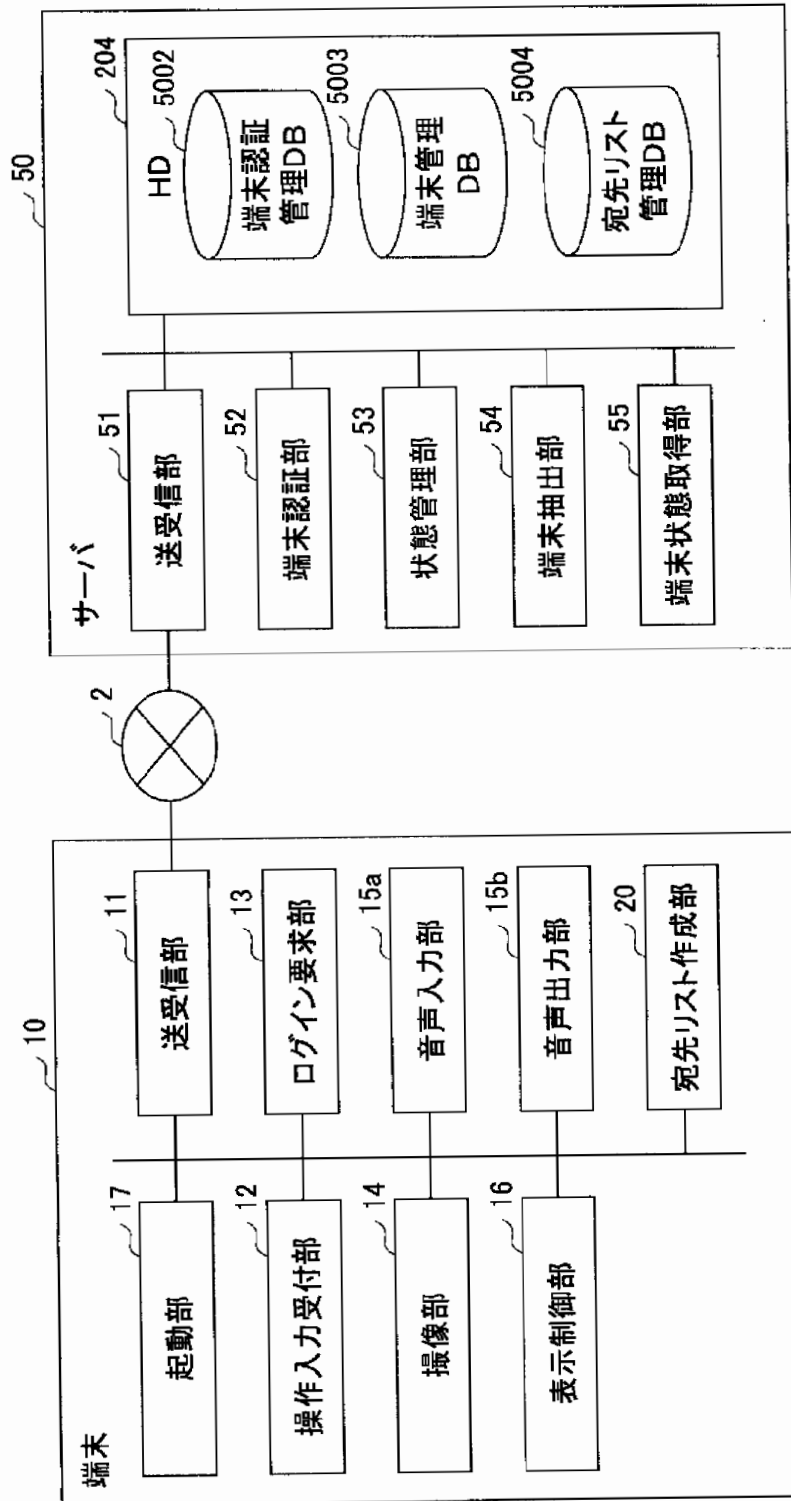
サーバのハードウェア構成図の一例



【図4】

端末認証システムの機能ブロック図の一例

100



【図5】

端末認証管理テーブル、端末管理テーブル、
宛先リスト管理テーブルの一例を示す図

(a)

端末ID	パスワード
01aa	aaaa
01ab	abab
01ba	baba
...	...

(b)

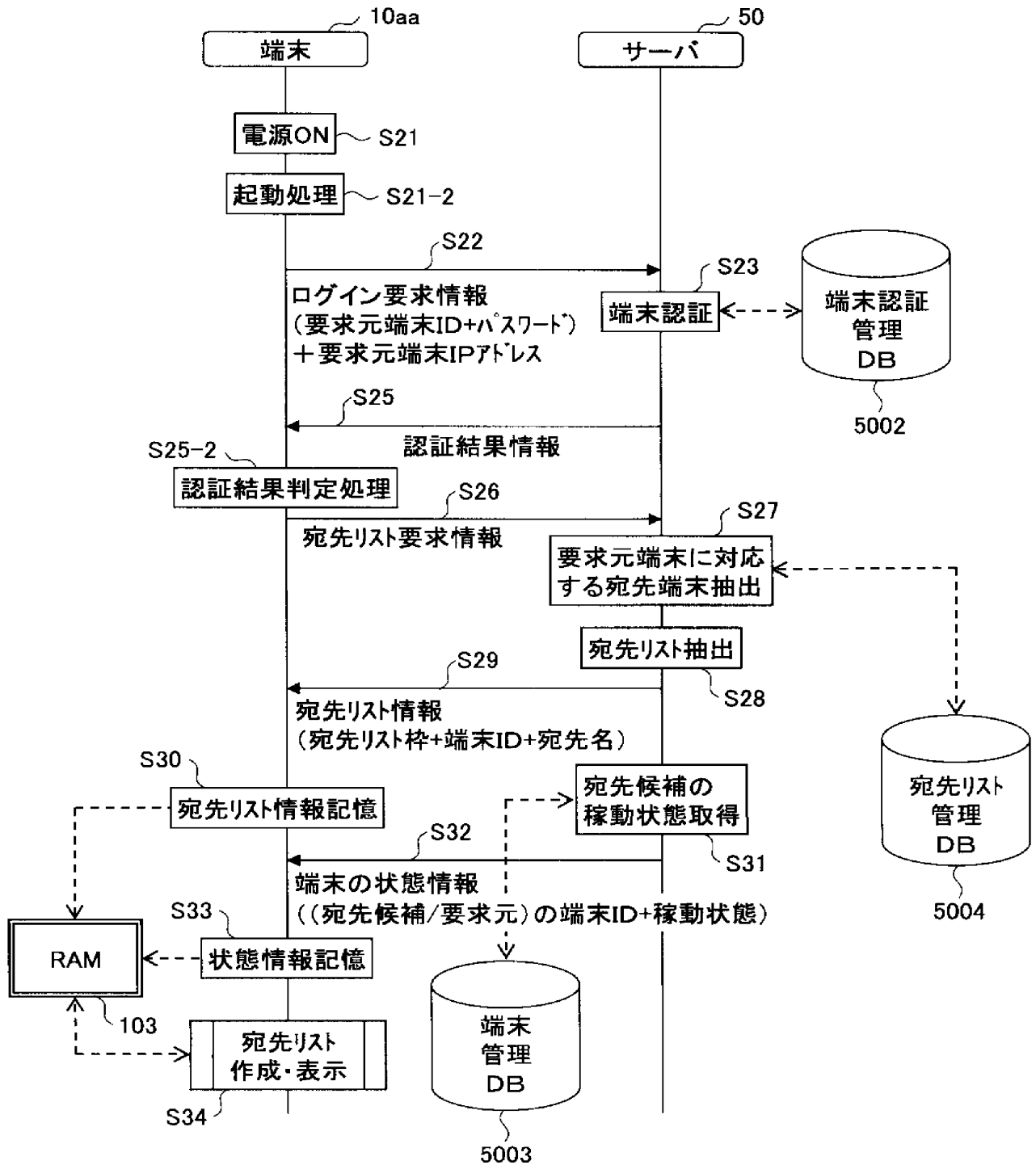
端末ID	宛先名	稼働状態	受信日時	端末のIPアドレス
01aa	日本 東京事業所 AA 端末	ONライン(通話可能)	2009.11.10.13:40	1.2.1.3
01ab	日本 東京事業所 AB 端末	OFFライン	2009.11.09.12:00	1.2.1.4
...	...	...	...	...
01ba	日本 大阪事業所 BA 端末	ONライン(一時中断中)	2009.11.10.13:45	1.2.2.3
01bb	日本 大阪事業所 BB 端末	ONライン(通話可能)	2009.11.10.13:50	1.2.2.4
...	...	...	...	...
01ca	アメリカ ニューヨーク事業所 CA 端末	OFFライン	2009.11.10.12:45	1.3.1.3
01cb	アメリカ ニューヨーク事業所 CB 端末	ONライン(通話中)	2009.11.10.13:55	1.3.1.4
...	...	...	...	...
01da	アメリカ ワシントン事業所 DA 端末	ONライン(通話中)	2009.11.08.12:45	1.3.2.3
01db	アメリカ ワシントン事業所 DB 端末	OFFライン	2009.11.10.12:45	1.3.2.4
...	...	...	...	...

(c)

要求元 端末ID	宛先 端末ID
01aa	01ab,...,01ba,01bb,...,01ca,01cb,01da,01db,...
01ab	01aa,01ca,01cb
01ba	01aa,01ab,01ca,01cb,01da,01db
...	...
01db	01aa,01ab,01ba,...,01da,01ca,01cb,...,01da

【図6】

端末の電源投入から宛先リストを表示するまでの手順を示す
シーケンス図の一例



ステップS34で宛先リスト作成部が作成する宛先リストの一例を示す図

□□□会議先を④⑦で選択し、[決定]で会議を開始できます。

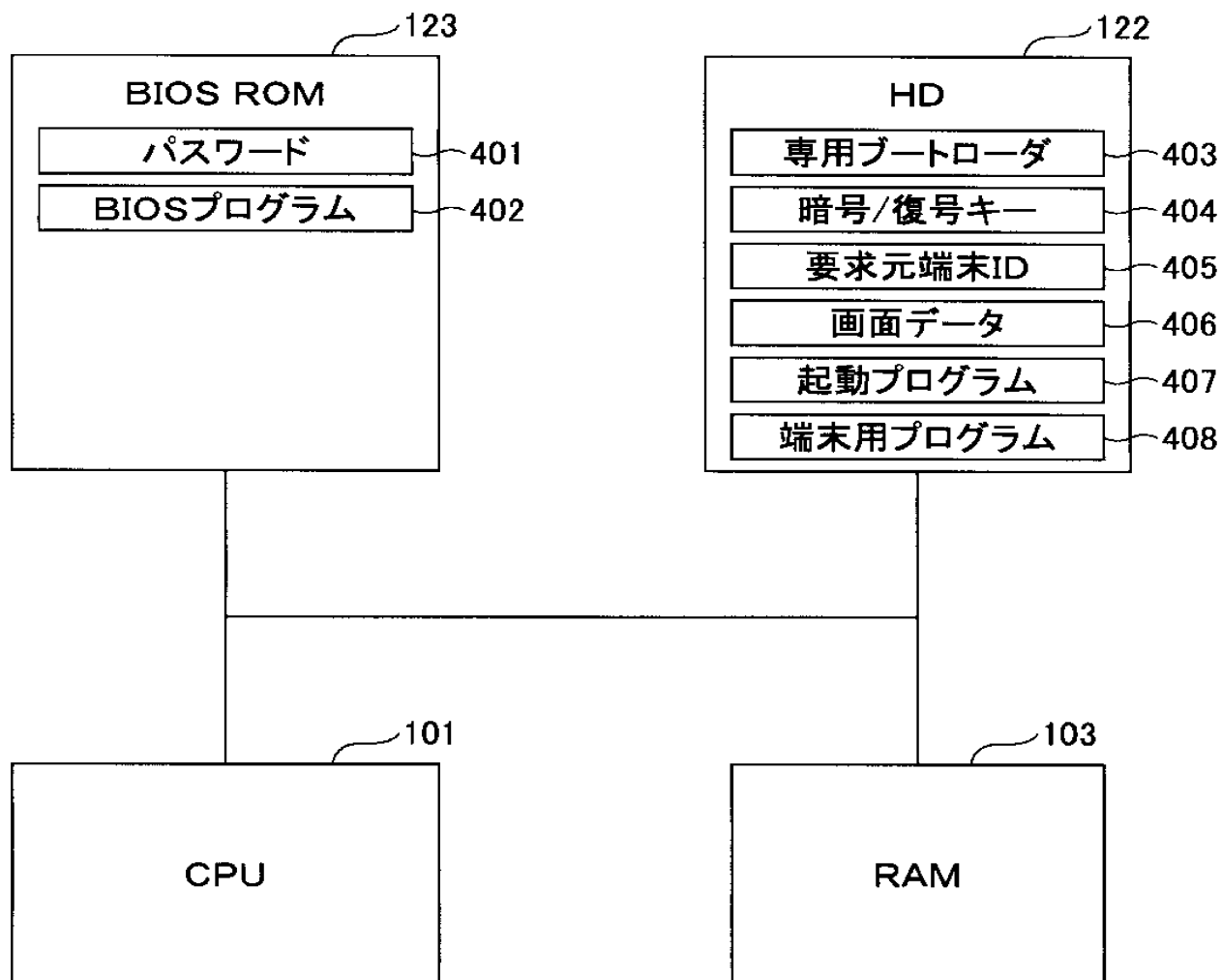
端末の状態を示すアイコン	宛先状態情報	宛先名 端末ID
	ONライン(通話中)	日本 東京事業所 AA 端末, 日本 東京事業所 AB 端末 01aa, 01ab
	ONライン(通話可能)	日本 大阪事業所 BA 端末 01ba
	OFFライン	日本 大阪事業所 BB 端末 01bb
	OFFライン	日本 九州事業所 QA 端末 01qa
	OFFライン	アメリカ ニューヨーク事業所 CA 端末 01ca
	OFFライン(接続中)	アメリカ ニューヨーク事業所 CB 端末 01cb
	OFFライン(接続中)	アメリカ ワシントン事業所 DA 端末 01da
	ONライン	自端末 01xx

■承認依頼が1件ありま□□□□□□□□□□□□□□□□2010/07/14* **13:39



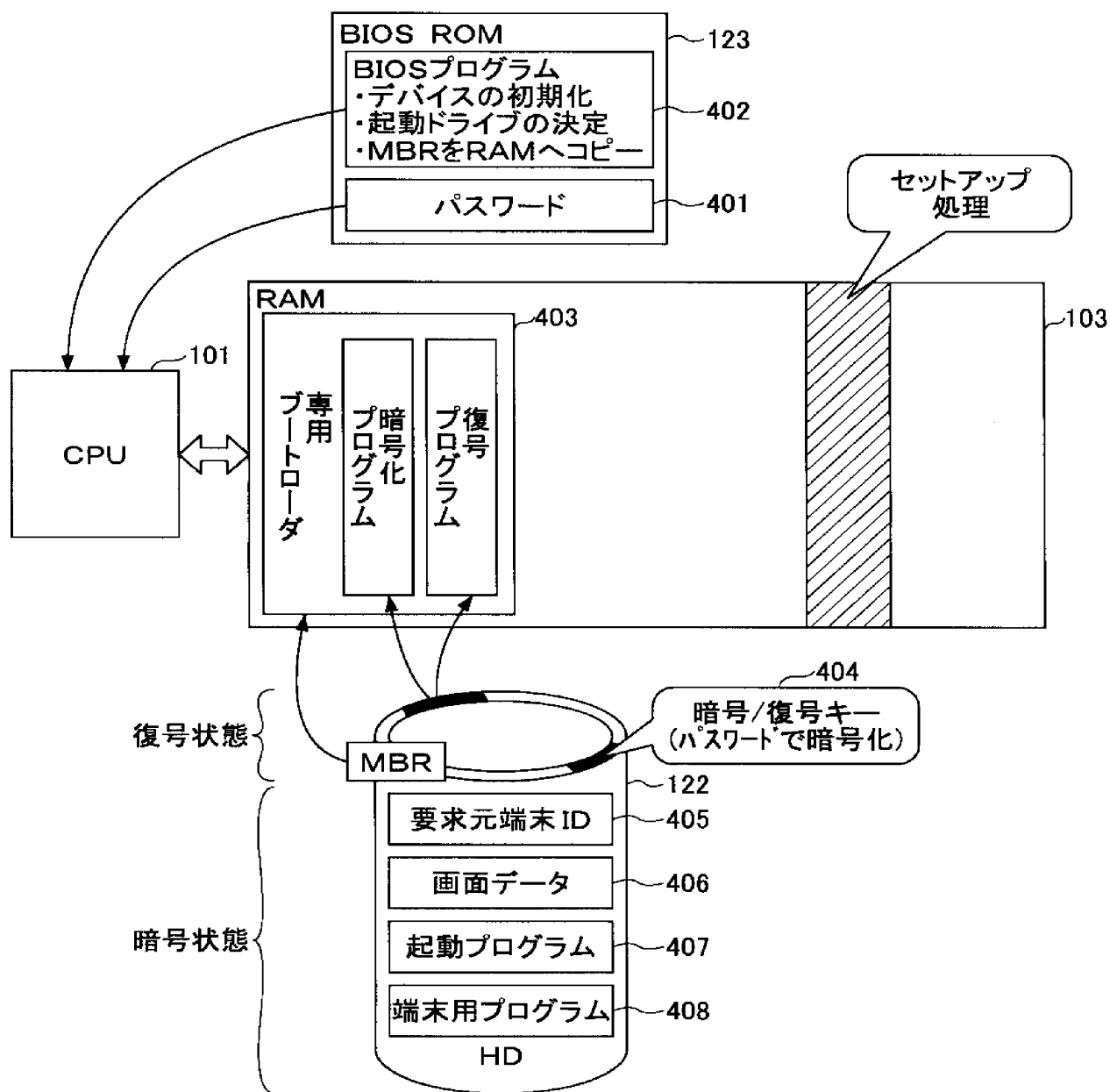
【図8】

端末のハードウェア構成図の一部の一例



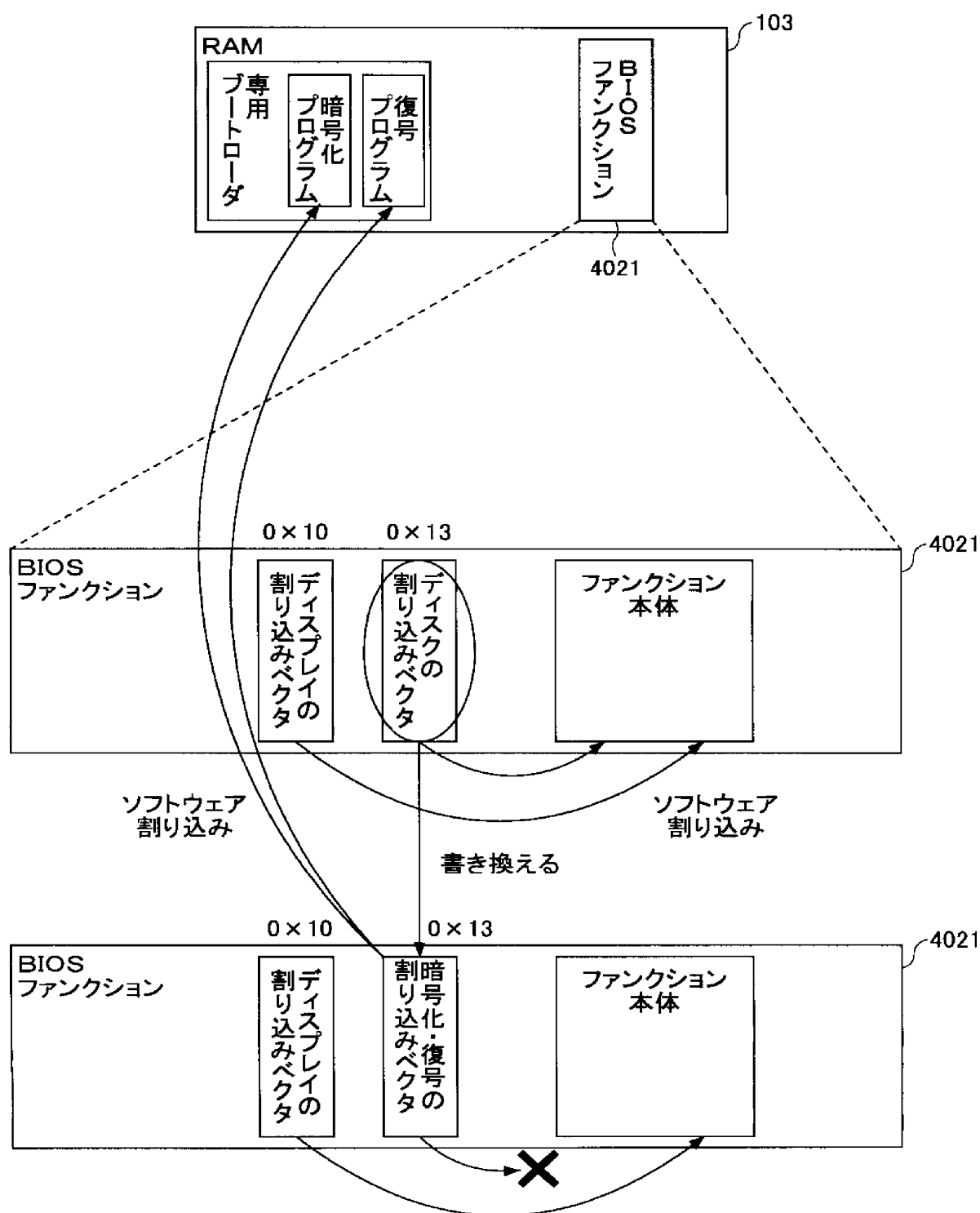
【図9】

HDの暗号化・復号方法の概略を説明する図の一例



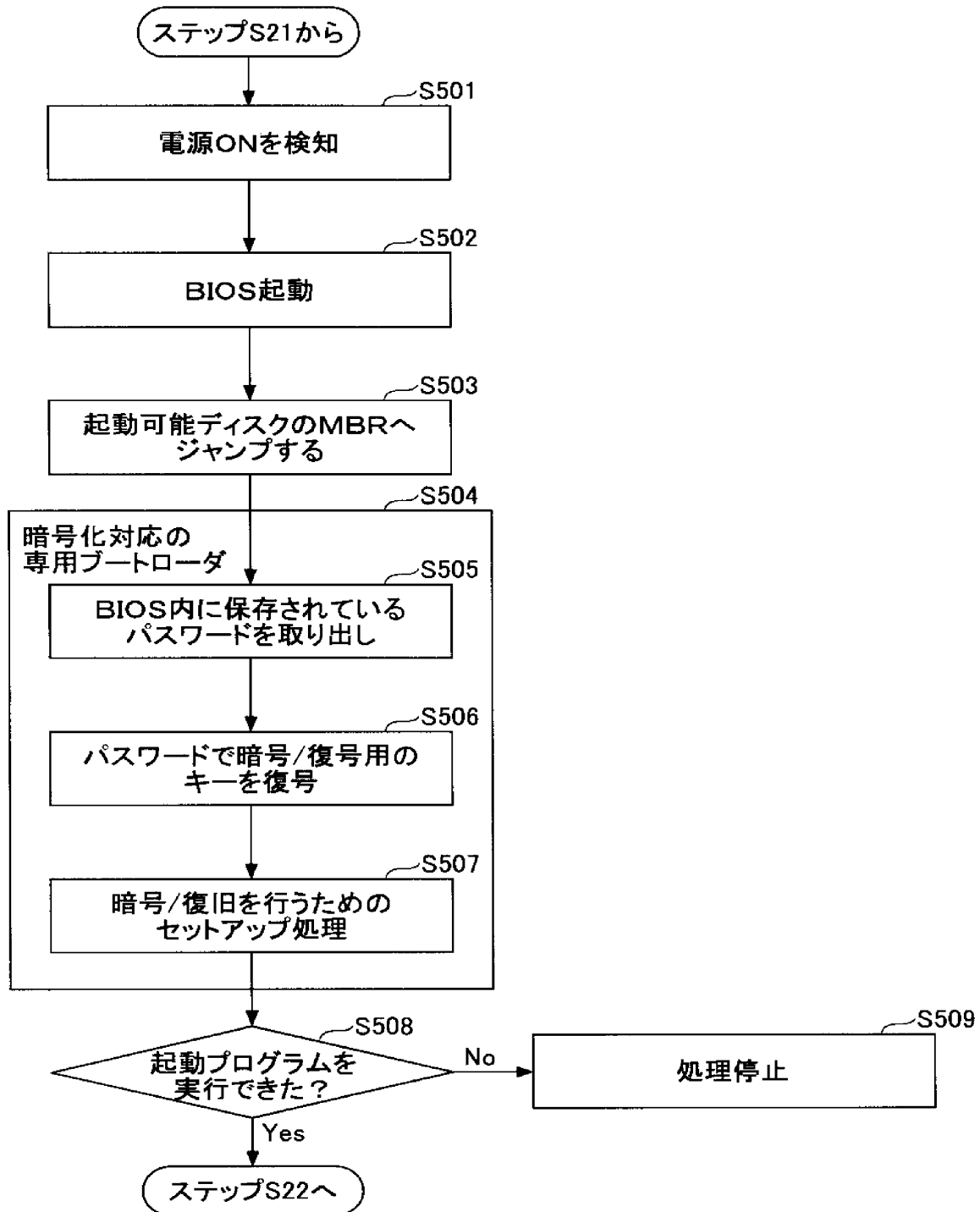
【図10】

HDの暗号化・復号方法の概略を説明する図の一例



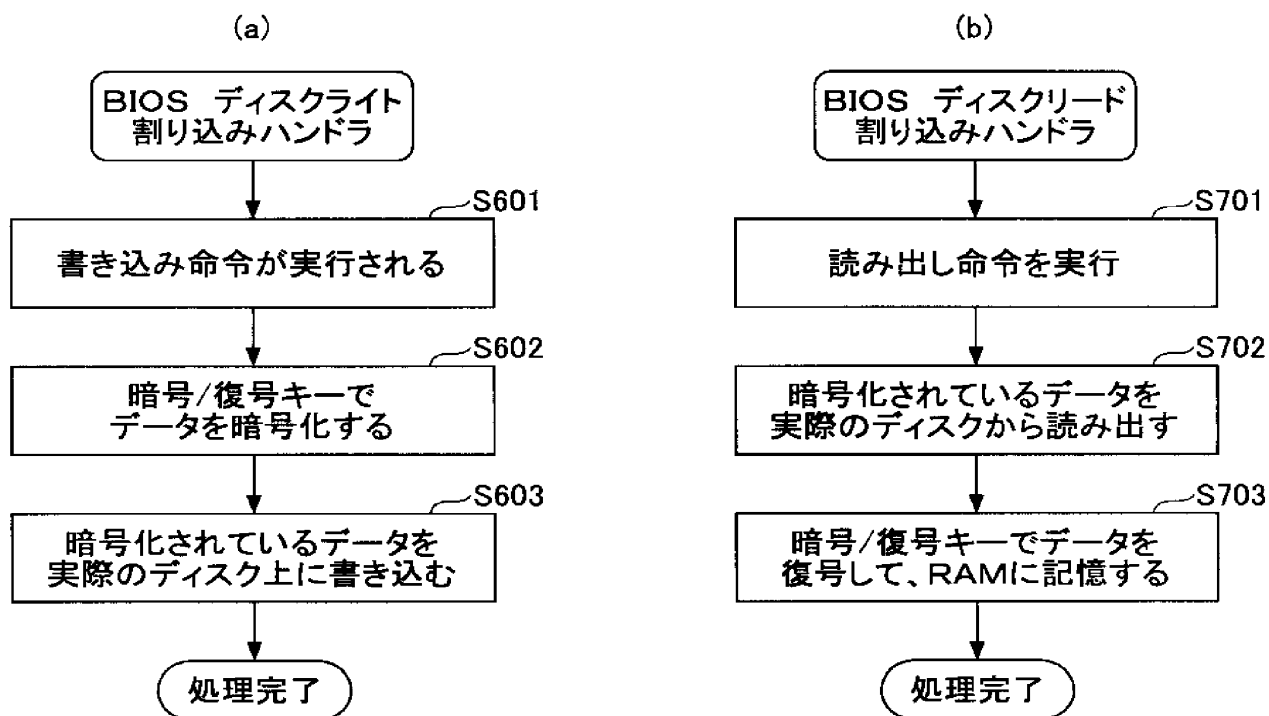
【図 11】

端末の起動手順を説明する図の一例



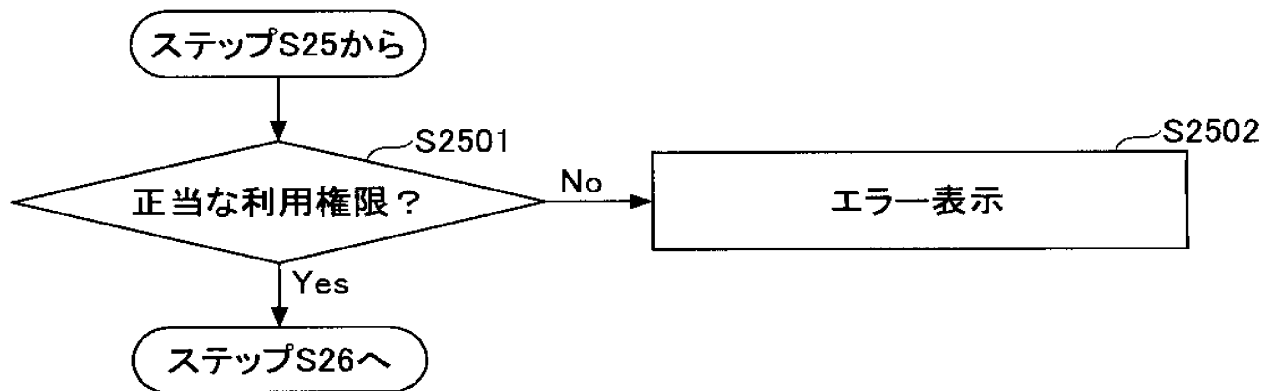
【図 1 2】

アプリケーションプログラムがHDにデータを書き出す手順を示すフローチャート図の一例



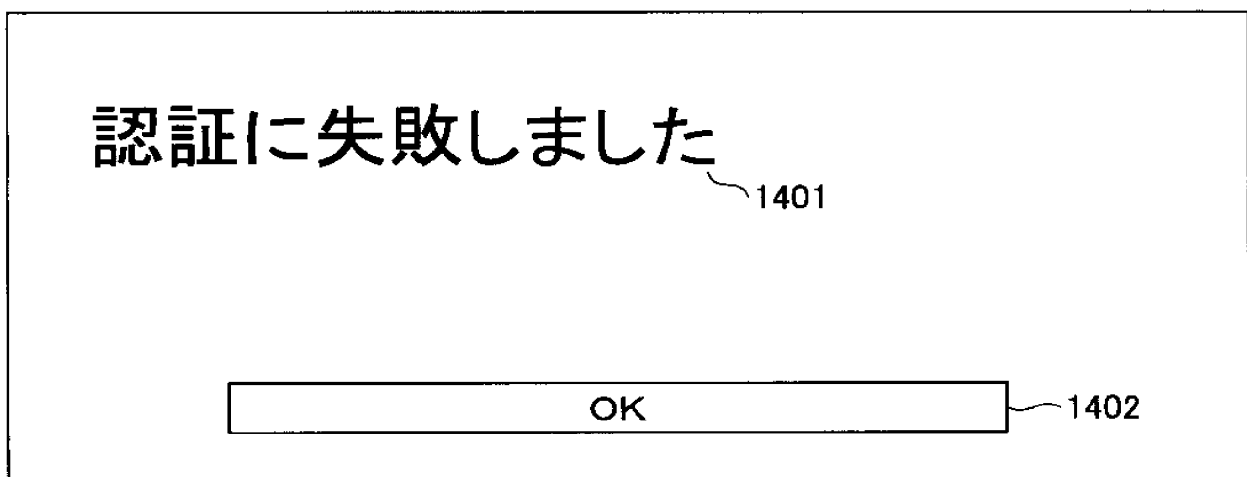
【図 1 3】

認証結果判定処理の一例を示す図



【図14】

ディスプレイに表示されたエラー表示の例を示す図



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 [INVENTOR]
 [ADDRESS] c/o Ricoh Co., Ltd.
 3-6, Nakamagome 1-chome, Ohta-ku
 Tokyo, Japan
 [NAME] Yoshinaga KATO
 [INVENTOR]
 [ADDRESS] c/o Ricoh Co., Ltd.
 3-6, Nakamagome 1-chome, Ohta-ku
 Tokyo, Japan
 [NAME] Taro OKUYAMA
 [APPLICANT FOR PATENT]
 [CODE NO.] 000006747
 [NAME] Ricoh Co., Ltd.
 [AGENT]
 [CODE NO.] 100072604
 [PATENT ATTORNEY]
 [NAME] Gunichiro ARIGA
 [TEL NO.] 03-5367-1351
 [INDICATION OF FEE]
 [NUMBER] 006529
 [AMOUNT OF FEE] 15000
 [LIST OF ATTACHED DOCUMENTS]
 [ITEM] CLAIMS 1
 [ITEM] SPECIFICATION 1
 [ITEM] DRAWINGS 1
 [ITEM] ABSTRACT 1
 [GENERAL POWER OF ATTORNEY NUMBER] 9809862

[Type of Document] Description

[Title of the Invention] TRANSMISSION MANAGEMENT APPARATUS

[Technical Field]

[0001]

The present invention relates to a transmission management apparatus, for example, to a transmission management apparatus that manages transmission states of transmission terminals used in a remote conference system with which a remote conference is held through a network.

[Background Art]

[0002]

Remote conference systems realize situations similar to actual conferences as follows. Images and sounds are collected by imaging attendees and collecting utterances of the attendees in conference rooms where remote conferences are held. The collected images and sounds are converted into digital data and transmitted by transmission terminals on one side to other transmission terminals on the other parties' side. The images are displayed on displays such as video screens and the sounds are output from speakers in conference rooms on the other parties' side.

[0003]

In an example of such remote conference systems, a remote conference can be realized among a plurality of sites by a relaying apparatus that is coupled to all of the transmission terminals attending the conference and controls delivery of image data and sound data to each transmission terminal.

[0004]

Generally, in a remote conference held among sites, a display screen of the transmission terminal is divided into the number of transmission terminals attending the conference and images transmitted from other transmission

terminals are displayed in the divided areas on the display screen so as to know who is attending the conference through other transmission terminals during the conference (e.g., refer to Patent Literature 1).

[Disclosure of Invention]

[Problem to be Solved by the Invention]

[0005]

Such a conventional technique, however, has a problem in that users who use the respective transmission terminals cannot grasp which transmission terminal is attending the conference when the number of transmission terminals attending the conference increases because the division number of the display screen is increased and thus a display area for displaying an image transmitted from each transmission terminal is reduced.

[0006]

The present invention has been made to solve such a conventional problem, and an object of the invention is to provide a transmission management apparatus that enables users who use respective transmission terminals to grasp which transmission terminal is attending a conference regardless of the number of transmission terminals attending the conference.

[Means for Solving Problem]

[0007]

A transmission management apparatus of the present invention is for managing transmission states of a plurality of transmission terminals. The transmission management apparatus includes a terminal management table storage unit configured to store therein a terminal management table in which terminal information including an identifier and an identification name of each of the transmission terminals is managed; a receiving unit

configured to receive a terminal information request signal indicating a request for information for identifying a transmission terminal that is in a transmission state with the transmission terminal; a terminal state acquisition unit configured to acquire the information for identifying the transmission terminal that is in a transmission state with the transmission terminal, from the terminal management table in response to the terminal information request signal; and a transmitting unit configured to transmit the information acquired by the terminal state acquisition unit to the transmission terminal that is a source having transmitted the terminal information request signal.

[0008]

With this configuration, the transmission management apparatus of the present invention transmits the information for identifying a transmission terminal that is in a transmission state with the transmission terminal that is a source having transmitted the terminal information request signal to the transmission terminal that is the source having transmitted the terminal information request signal, and thus enables users who use the respective transmission terminals to grasp which transmission terminal is attending a conference regardless of the number of transmission terminals attending the conference.

[0009]

The transmission management apparatus according to the present invention may further includes a destination list management table storage unit configured to store therein a destination list management table in which a destination list including the identifiers of the transmission terminals that have been already registered is managed for each of the transmission terminals. The terminal state

acquisition unit may acquire, from among the transmission terminals that are in a transmission state with the transmission terminal that is a source having transmitted the terminal information request signal, an identifier and an identification name, included in the terminal information, of a transmission terminal that is registered in the destination list for the transmission terminal that is the source having transmitted the terminal information request signal, and acquires an identifier, included in the terminal information, of a transmission terminal that is not registered in the destination list.

[0010]

With this configuration, the transmission management apparatus of the present invention does not transmit an identification name of a transmission terminal that is not registered in the destination list, and thus enables the attendance of an unknown party at the video conference to be informed. As a result, the video conference can proceed with careful attention to discussion contents.

[0011]

A transmission terminal of the present invention performs transmission with at least one transmission terminal through a network connected to a transmission management apparatus for managing transmission states of a plurality of transmission terminals. The transmission terminal includes a transmitting unit configured to transmit a terminal information request signal indicating a request for information for identifying a transmission terminal that is in a transmission state with the transmission terminal, to the transmission management apparatus; a receiving unit configured to receive information that is transmitted from the transmission management apparatus in response to the terminal

information request signal; and a display control unit configured to cause a display unit to display the information received by the receiving unit.

[0012]

With this configuration, the transmission terminal of the present invention can acquire information for identifying a transmission terminal that is in a transmission state with the transmission terminal, from the transmission management apparatus, and thus enables users who use the respective transmission terminals to grasp which transmission terminal is attending a conference regardless of the number of transmission terminals attending the conference.

[0013]

The transmission terminal according to the present invention may further include an operation input reception unit configured to receive input from a user. The display control unit may have two modes of an all-image display mode causing the display unit to display all images transmitted from the transmission terminal that is in a transmission state and an information display mode causing the display unit to display the information transmitted from the transmission management apparatus, and the display control unit may switch between the two modes when the operation input reception unit receives the input, and transmit the terminal information request signal to the transmission management apparatus after switching the all-image display mode to the information display mode.

[0014]

With this configuration, the transmission terminal of the present invention can cause the display unit to display all images transmitted from the transmission terminal that is in a transmission state or the information on the

transmission terminal that is in a transmission state, in response to a user's input operation.

[0015]

The transmission terminal according to the present invention may further include an image data input unit to which image data representing an image taken by an imaging device is input. The display control unit may cause the display unit to display an image represented by the image data that is input to the image data input unit of a major transmission terminal among all the transmission terminals that are in a transmission state and transmitted, in addition to the information received by the receiving unit.

[0016]

With this configuration, the transmission terminal of the present invention allow a user to grasp a situation of a major site even when the information on the transmission terminal that is in a transmission state remains displayed on the display unit.

[0017]

The transmission terminal according to the present invention may further include a sound data input unit to which sound data representing sound obtained by a sound collector is input. The display control unit may identify the transmission terminal from which the sound data representing voices input to the sound data input unit is transmitted is the major transmission terminal among all the transmission terminals that are in a transmission state.

[0018]

With this configuration, the transmission terminal of the present invention can identify the transmission terminal in the site where participants are taking.

[0019]

A transmission system of the present invention

includes a plurality of transmission terminals; and a transmission management apparatus configured to manage transmission states of the transmission terminals. The transmission management apparatus includes a terminal management table storage unit configured to store therein a terminal management table in which terminal information is managed, the terminal information including an identifier and an identification name of each of the transmission terminals, a receiving unit configured to receive a terminal information request signal indicating a request for information for identifying a transmission terminal that is in a transmission state with the transmission terminal, a terminal state acquisition unit configured to acquire the information for identifying the transmission terminal that is in a transmission state with the transmission terminal that is a source having transmitted the terminal information request signal, from the terminal management table in response to the terminal information request signal, and a transmitting unit configured to transmit the information acquired by the terminal state acquisition unit to the transmission terminal that is the source having transmitted the terminal information request signal. Each transmission terminal includes a transmitting unit configured to transmit a terminal information request signal indicating a request for information for identifying a transmission terminal that is in a transmission state with the transmission terminal, to the transmission management apparatus, a receiving unit configured to receive the information transmitted from the transmission management apparatus in response to the terminal information request signal, and a display control unit configured to cause a display unit to display the information received by the receiving unit.

[0020]

With this configuration, the transmission system of the present invention transmits from the transmission management apparatus the information for identifying a transmission terminal that is in a transmission state with the transmission terminal that is a source having transmitted the terminal information request signal to the transmission terminal that is the source having transmitted the terminal information request signal, and thus enables users who use the respective transmission terminals to grasp which transmission terminal is attending a conference regardless of the number of transmission terminals attending the conference.

[0021]

A transmission management method of the present invention is for managing transmission states of a plurality of transmission terminals, wherein a terminal management table in which terminal information including an identifier and an identification name of each of the transmission terminals is managed is stored in a recording medium in advance. The transmission management method includes a receiving step of receiving a terminal information request signal indicating a request for information for identifying a transmission terminal that is in a transmission state with the transmission terminal; a terminal information acquiring step of acquiring the information for identifying the transmission terminal that is in a transmission state with the transmission terminal that is a source having transmitted the terminal information request signal, from the terminal management table, in response to the terminal information request signal; and a transmitting step of transmitting the information acquired at the terminal information acquiring

step to the transmission terminal that is the source having transmitted the terminal information request signal.

[0022]

According to this method, the information for identifying a transmission terminal that is in a transmission state with the transmission terminal that is a source having transmitted the terminal information request signal is transmitted to the transmission terminal that is the source having transmitted the terminal information request signal, and thus it is possible to enable users who use the respective transmission terminals to grasp which transmission terminal is attending a conference regardless of the number of transmission terminals attending the conference.

[0023]

A transmission terminal control method of the present invention uses a transmission terminal that performs transmission with at least one transmission terminal through a network that is connected to a transmission management apparatus for managing transmission states of a plurality of transmission terminals. The method includes a transmitting step of transmitting a terminal information request signal indicating a request for information for identifying a transmission terminal that is in a transmission state with the transmission terminal; a receiving step of receiving information that is transmitted from the transmission management apparatus in response to the terminal information request signal; and a display control step of causing a display unit to display the information received at the receiving step.

[0024]

According to this method, information for identifying a transmission terminal that is in a transmission state

with the transmission terminal can be acquired from the transmission management apparatus, and thus it is possible to enable users who use the respective transmission terminals to grasp which transmission terminal is attending a conference regardless of the number of transmission terminals attending the conference.

[0025]

A transmission management program of the present invention is performed by a computer included in a transmission management apparatus for managing transmission states of a plurality of transmission terminals, wherein a terminal management table in which terminal information including an identifier and an identification name of each of the transmission terminals is managed is stored in a recording medium in advance. The transmission management program includes a receiving step of receiving a terminal information request signal indicating a request for information for identifying a transmission terminal that is in a transmission state with the transmission terminal; a terminal information acquiring step of acquiring the information for identifying the transmission terminal that is in a transmission state with the transmission terminal that is a source having transmitted the terminal information request signal, from the terminal management table, in response to the terminal information request signal; and a transmitting step of transmitting the information acquired at the terminal information acquiring step to the transmission terminal that is the source having transmitted the terminal information request signal.

[0026]

According to this program, the information for identifying a transmission terminal that is in a transmission state with the transmission terminal that is a

source having transmitted the terminal information request signal is transmitted to the transmission terminal that is the source having transmitted the terminal information request signal, and thus it is possible to enable users who use the respective transmission terminals to grasp which transmission terminal is attending a conference regardless of the number of transmission terminals attending the conference.

[0027]

A transmission terminal control program of the present invention is performed by a computer included in a transmission terminal that performs transmission with at least one transmission terminal through a network that is connected to a transmission management apparatus for managing transmission states of a plurality of transmission terminals. The transmission terminal control program includes a transmitting step of transmitting a terminal information request signal indicating a request for information for identifying a transmission terminal that is in a transmission state with the transmission terminal; a receiving step of receiving information that is transmitted from the transmission management apparatus in response to the terminal information request signal; and a display control step of causing a display unit to display the information received at the receiving step.

[0028]

According to this program, information for identifying a transmission terminal that is in a transmission state with the transmission terminal can be acquired from the transmission management apparatus, and thus it is possible to enable users who use the respective transmission terminals to grasp which transmission terminal is attending a conference regardless of the number of transmission

terminals attending the conference.

[0029]

[Effect of the Invention]

The present invention enables users who use the respective transmission terminals to grasp which transmission terminal is attending a conference regardless of the number of transmission terminals attending the conference.

[Brief Description of Drawings]

[0030]

[Fig. 1] Fig. 1 is a schematic illustrating a structure of a transmission system.

[Fig. 2] Fig. 2 is a conceptual view illustrating a state of transmitting and receiving of image data, sound data, and various types of management information in the transmission system.

[Fig. 3] Fig. 3 illustrates image quality of the image data.

[Fig. 4] Fig. 4 is an external view of a transmission terminal.

[Fig. 5] Fig. 5 is a schematic illustrating a hardware structure of the transmission terminal.

[Fig. 6] Fig. 6 is a schematic illustrating a hardware structure of a transmission management apparatus, a relaying apparatus, or a program supply apparatus.

[Fig. 7] Fig. 7 is a functional block diagram of the transmission terminal and the transmission management system.

[Fig. 8] Fig. 8 is a conceptual view of a terminal authentication management table.

[Fig. 9] Fig. 9 is a conceptual view of a terminal management table.

[Fig. 10] Fig. 10 is a conceptual view of a

destination list management table.

[Fig. 11] Fig. 11 is a sequence diagram illustrating preparatory stage operation of the transmission system.

[Fig. 12] Fig. 12 is a sequence diagram illustrating conference attendance operation of the transmission system.

[Fig. 13] Fig. 13 is a sequence diagram illustrating data transmission operation of the transmission system.

[Fig. 14] Fig. 14 is a conceptual view illustrating a display screen in an all-image display mode.

[Fig. 15] Fig. 15 is a conceptual view illustrating a display screen in an information display mode.

[Fig. 16] Fig. 16 is a sequence diagram illustrating terminal information display operation of the transmission system.

[Best Mode(s) of Carrying Out the Invention]

[0031]

An embodiment of the present invention will be described below with reference to the accompanying drawings.

[0032]

<<Overall structure of embodiment>>

Fig. 1 is a schematic of a transmission system 1 according to the embodiment. Fig. 2 is a conceptual view illustrating a state of transmitting and receiving of image data, sound data, and various types of management information in the transmission system 1. Fig. 3 illustrates image quality of the image data.

[0033]

The transmission system includes a data supply system in which content data is transmitted from a transmission terminal to a plurality of transmission terminals through a transmission management apparatus in one direction and a communication system in which information and feelings, for example, are mutually transmitted among the transmission

terminals through the transmission management apparatus. The communication system is a system for transmitting information and feelings mutually between a plurality of communication terminals (corresponding to the "transmission terminals") through a communication management apparatus (corresponding to the "transmission management apparatus"). Examples of the communication system include a video conference system and a video telephone system.

[0034]

In the embodiment, the transmission system, the transmission management apparatus, and the transmission terminal are described on the assumption of the video conference system as an example of the communication system, a video conference management apparatus as an example of the communication management apparatus, and a video conference terminal as an example of the communication terminal. That is, the transmission terminal and the transmission management apparatus are applicable to not only the video conference system but also the communication system or a data transmission system.

[0035]

As illustrated in Fig. 1, the transmission system 1 includes a plurality of transmission terminals 10aa, 10ab, ..., displays 120aa, 120ab, ..., for the respective transmission terminals 10aa, 10ab, ..., a relaying apparatus 30, a transmission management apparatus 50, and a program supply apparatus 90. The transmission terminals 10aa, 10ab, ..., perform transmission by transmitting and receiving content data, such as image data and sound data.

[0036]

In the following descriptions, an arbitrary transmission terminal among the transmission terminals 10aa, 10ab, ..., is expressed as a "transmission terminal 10",

and an arbitrary display among the displays 120aa, 120ab, ..., is expressed as a "display 120". In addition, one of the transmission terminals 10 that requests a start of a video conference as a request source is expressed as a "request source terminal" and another transmission terminal 10 that is a destination of the request is expressed as a "destination terminal".

[0037]

As illustrated in Fig. 2, in the transmission system 1, a management information session SEI for transmitting and receiving various types of management information is established between the request source terminal and the destination terminal through the transmission management apparatus 50.

[0038]

Between the transmission terminals 10 with the management information session SEI established, four sessions are established for transmitting and receiving four pieces of high resolution image data, medium resolution image data, low resolution image data, and sound data through the relaying apparatus 30. In the embodiment, the four sessions are collectively expressed as an "image/sound data session SED".

[0039]

The image data in the embodiment is scalably encoded. For example, image data in the embodiment includes low resolution image data that is composed of 320 pixels horizontally and 180 pixels vertically as illustrated in (a) of Fig. 3 and serves as a base image, medium resolution image data composed of 640 pixels horizontally and 360 pixels vertically as illustrated in (b) of Fig. 3, and high resolution image data composed of 1280 pixels horizontally and 720 pixels vertically as illustrated in (c) of Fig. 3.

[0040]

When a bandwidth through which image data is transmitted is narrow, only the low resolution image data serving as the base image is transmitted and the transmission terminal 10 on a receiving side can display only a low quality image in accordance with the transmitted low resolution image data.

[0041]

When the bandwidth through which image data is transmitted is relatively wide, the low resolution image data serving as the base image and the medium resolution image data are transmitted and the transmission terminal 10 on the receiving side can display a medium quality image in accordance with the transmitted low resolution image data and medium resolution image data.

[0042]

When the bandwidth through which image data is transmitted is very wide, the low resolution image data serving as the base image, the medium resolution image data, and the high resolution image data are transmitted and the transmission terminal 10 on the receiving side can display a high quality image in accordance with the transmitted low resolution image data, medium resolution image data, and high resolution image data.

[0043]

In Fig. 1, the relaying apparatus 30 relays content data among the transmission terminals 10. The transmission management apparatus 50 performs login authentication of the transmission terminal 10 and manages a transmission state of the transmission terminal 10, a destination list, and a transmission state of the relaying apparatus 30, for example, in an integrated fashion. Images represented by the image data may be moving images or still images, or

both moving and still images.

[0044]

A plurality of routers 70a, 70b, 70c, 70d, 70ab, and 70cd select optimal routes for image data and sound data. In the following descriptions, an arbitrary router among the routers 70a, 70b, 70c, 70d, 70ab, and 70cd is expressed as a "router 70".

[0045]

The program supply apparatus 90 includes an HD (Hard Disk) 204 (refer to Fig. 6), which is described later. A transmission terminal control program enabling the transmission terminal 10 to have various functions is stored in the HD 204. The program supply apparatus 90 can transmit the transmission terminal control program to the transmission terminal 10.

[0046]

In addition, the program supply apparatus 90 stores a relaying apparatus program enabling the relaying apparatus 30 to have various functions in the HD 204 and can transmit the relaying apparatus program to the relaying apparatus 30.

[0047]

Furthermore, the program supply apparatus 90 also stores a transmission management program enabling the transmission management apparatus 50 to have various functions in the HD 204 and can transmit the transmission management program to the transmission management apparatus 50.

[0048]

The transmission terminals 10aa, 10ab, 10ac, ..., and the router 70a are coupled to each other with a LAN 2a so as to enable transmission among them. Transmission terminals 10ba, 10bb, 10bc, ..., and the router 70b are coupled to each other with a LAN 2b so as to enable

transmission among them.

[0049]

The LANs 2a and 2b are coupled to each other with a dedicated line 2ab including the router 70ab so as to enable transmission among them, and disposed in a predetermined region A. For example, the region A is Japan and the LAN 2a is disposed in a business office in Tokyo while the LAN 2b is disposed in a business office in Osaka.

[0050]

Transmission terminals 10ca, 10cb, 10cc, ..., and the router 70c are coupled to each other with a LAN 2c so as to enable transmission among them. Transmission terminals 10da, 10db, 10dc, ..., and the router 70d are coupled to each other with a LAN 2d so as to enable transmission among them.

[0051]

The LANs 2c and 2d are coupled to each other with a dedicated line 2cd including the router 70cd so as to enable transmission among them, and disposed in a predetermined region B. For example, the region B is the United States of America and the LAN 2c is disposed in a business office in New York while the LAN 2d is disposed in a business office in Washington, D.C. The regions A and B are coupled to each other with the routers 70ab and 70cd through the Internet 2i so as to enable mutual transmission.

[0052]

The relaying apparatus 30, the transmission management apparatus 50, and the program supply apparatus 90 are coupled to each transmission terminal 10 through the Internet 2i so as to enable the apparatuses to perform transmission to each transmission terminal 10. The relaying apparatus 30, the transmission management apparatus 50, and the program supply apparatus 90 may be

disposed in the region A or the region B, or in any region other than the regions A and B.

[0053]

In the embodiment, a transmission network 2 of the embodiment includes the LANs 2a and 2b, the dedicated lines 2ab and 2cd, the Internet 2i, and the LANs 2c and 2d. The transmission network 2 may include a unit in which transmission is performed wirelessly such as wireless fidelity (Wi-Fi, registered trademark) or Bluetooth (registered trademark) besides the wired transmission.

[0054]

In Fig. 1, four numbers indicated under each transmission terminal 10, the relaying apparatus 30, the transmission management apparatus 50, each router 70, and the program supply apparatus 90 simply represent commonly used IP addresses in IPv4. For example, the IP address of the transmission terminal 10aa is "1.2.1.3". IPv6 may be also used instead of IPv4. However, the explanation is made by using IPv4 for simple explanation.

[0055]

Each transmission terminal 10 may be used in a video conference held in the same room, or in a video conference held between an outdoor site and an indoor site or among the outdoor sites, in addition to a video conference held among a plurality of business offices and a video conference held among different rooms in the same business office. When each transmission terminal 10 is used at an outdoor site, transmission is performed wirelessly such as a cellular phone transmission network.

[0056]

<<Hardware structure of embodiment>>

As illustrated in Fig. 4, the transmission terminal 10 includes a housing 1021, an arm 1074, and a camera housing

1075. A front sidewall 1021a of the housing 1021 has a plurality of air intake holes 1021e on almost the entire surface thereof. A rear sidewall 1021b of the housing 1021 has a plurality of air exhaust holes (not illustrated) on almost the entire area thereof. As a result, the transmission terminal 10 can intake external air at the front of the transmission terminal 10 through the air intake holes 1021e and exhaust air toward the rear of the transmission terminal 10 through the air exhaust holes by driving a cooling fan included in the housing 1021. The front sidewall 1021a has a sound-collecting hole 1021f at the central part thereof. The sound-collecting hole 1021f enables a built-in microphone 114 (refer to Fig. 5), which is described later, to collect sounds such as voices, other sounds, and noises.

[0057]

The housing 1021 has an operation panel 1022 on the left side when viewed from the front thereof. The operation panel 1022 is provided with operation buttons 108, a power switch 109, and a plurality of sound output holes 1022f through which sounds output from a built-in speaker 115 (refer to Fig. 5), which is described later, pass. In addition, the housing 1021 has a housing unit 1021p formed in a recess so as to house the arm 1074 and the camera housing 1075, on the right side when viewed from the front thereof.

[0058]

The arm 1074 is mounted on the housing 1021 with a torque hinge 1073. For example, the arm 1074 is mounted so as to be rotatable in the up-down and left-right directions within a range of a pan angle $\theta 1$ of ± 180 degrees and within a range of a tilt angle $\theta 2$ of 90 degrees when the angle of the arm 1074 at the front is 0 degrees with respect to the

housing 1021. When the tilt angle θ_2 is approximately 45 degrees, a click feeling is generated.

[0059]

The camera housing 1075 includes a built-in camera 112 (refer to Fig. 5), which is described later. The camera 112 can be used to image a user and a room, for example. The camera housing 1075 has a torque hinge 1075a.

[0060]

The camera housing 1075 is mounted on the arm 1074 with the torque hinge 1075a. For example, the camera housing 1075 is mounted on the arm 1074 so as to be rotatable within a tilt angle θ_3 of approximately 100 degrees toward the front side of the transmission terminal 10 and approximately 90 degrees toward the rear side of the transmission terminal 10 when the angle of 0 degrees is defined as a state in which the camera housing 1075 and the arm 1074 are arranged in a straight line.

[0061]

As illustrated in Fig. 5, the transmission terminal 10 includes a central processing unit (CPU) 101 that controls overall operation of the transmission terminal 10, a read only memory (ROM) 102 that stores therein a program used to drive the CPU 101 such as an initial program loader (IPL), a random access memory (RAM) 103 used as a working area of the CPU 101, a flash memory 104 that stores therein various types of data such as the transmission terminal control program, the image data, and the sound data, a solid state drive (SSD) 105 that controls reading of various types of data from or writing various types of data into the flash memory 104 under the control of the CPU 101, a media drive 107 that controls reading of data from or writing (storing) of data into a recording medium 106 such as a flash memory, the operation button 108 operated when a destination of the

transmission terminal 10 is selected, for example, the power switch 109 that switches ON and OFF of a power supply of the transmission terminal 10, and a network interface (I/F) 111 that performs data transmission by utilizing the transmission network 2.

[0062]

The transmission terminal 10 further includes the built-in camera 112 that images a subject and acquires the image data under the control of the CPU 101, an image capturing device I/F 113 that controls driving of the camera 112, the microphone 114 that serves as a built-in sound collector receiving sounds, the built-in speaker 115 that outputs sounds, a sound input-output I/F 116 that processes input and output of a sound signal between the microphone 114 and the speaker 115 under the control of the CPU 101, a display I/F 117 that transmits image data to the display 120 externally mounted under the control of the CPU 101, an external device connection I/F 118 that connects various external devices, and a bus line 110 that electrically connects the above-described components, such as an address bus or a data bus.

[0063]

The display 120 is a display device including liquid crystal or organic EL by which images of subjects and operation icons, for example, are displayed. The display 120 is coupled to the display I/F 117 with a cable 120c. The cable 120c may be an analog RGB (VGA) signal cable, a component video cable, an HDMI high-definition multimedia interface (HDMI) signal cable, or a digital video interactive (DVI) signal cable.

[0064]

The camera 112 includes a lens and a solid state image capturing device that converts light into charges so as to

generate an electrically available image of a subject. As the solid state image capturing device, a CMOS or a CCD is used, for example.

[0065]

The external device connection I/F 118 can couple an external device such as an external camera, an external microphone, or an external speaker with a universal serial bus (USB) cable, for example.

[0066]

When an external camera is coupled to the external device connection I/F 118, the CPU 101 drives the external camera prior to the built-in camera 112. When an external microphone or an external speaker is coupled to the external device connection I/F 118, the CPU 101 drives the external microphone and the external speaker prior to the built-in microphone 114 and the built-in speaker 115.

[0067]

The recording medium 106 is attachable to and detachable from the transmission terminal 10. An electrically erasable and programmable ROM (EEPROM) may be used for the transmission terminal 10, for example, as a non-volatile memory from which data is read or into which data is written under the control of the CPU 101, instead of the flash memory 104.

[0068]

The transmission terminal control program may be recorded into a computer readable recording medium such as the recording medium 106 in an installable format or an executable format and distributed. The transmission terminal control program may be stored in the ROM 102 instead of the flash memory 104.

[0069]

As illustrated in Fig. 6, the transmission management

apparatus 50 includes a CPU 201 that controls the overall operation of the transmission management apparatus 50, a ROM 202 that stores therein a program used to drive the CPU 201 such as an IPL, a RAM 203 that is used as a working area of the CPU 201, the HD 204 that stores therein various types of data such as the transmission management program, an HDD (Hard Disk Drive) 205 that controls reading of various types of data from or writing of various types of data into the HD 204 under the control of the CPU 201, a media drive 207 that controls reading data from or writing (storing) data into a recording medium 206 such as a flash memory, a display 208 that displays various types of information such as a cursor, menus, windows, characters, or images, a network I/F 209 that performs data transfer by utilizing the transmission network 2, a keyboard 211 provided with a plurality of keys for inputting characters, numerical values, and various instructions, a mouse 212 that is used to select and execute various instructions, select items to be processed, and move the cursor, a compact disc read only memory (CD-ROM) drive 214 that controls reading of various types of data from or writing of various types of data into a CD-ROM 213 as an example of an attachable-detachable recording medium, and a bus line 210 that electrically connects the above-described components, such as an address bus or a data bus.

[0070]

The transmission management program may be recorded into a computer readable recording medium such as the recording medium 206 and the CD-ROM 213 in an installable format or an executable format and distributed. The transmission management program may be stored in the ROM 202 instead of the HD 204.

[0071]

The relaying apparatus 30 has the same hardware structure as that of the transmission management apparatus 50. The description thereof is, thus, omitted. The HD 204 stores therein the relaying apparatus program that controls the relaying apparatus 30.

[0072]

Also in this case, the relaying apparatus program may be recorded into a computer readable recording medium such as the recording medium 206 and the CD-ROM 213 in an installable format or an executable format and distributed. The relaying apparatus program may be stored in the ROM 202 instead of the HD 204.

[0073]

The program supply apparatus 90 has the same hardware structure as that of the transmission management apparatus 50. The description thereof is, thus, omitted. The HD 204 stores therein a program supply apparatus program that controls the program supply apparatus 90.

[0074]

Also in this case, the program supply apparatus program may be recorded into a computer readable recording medium such as the recording medium 206 and the CD-ROM 213 in an installable format or an executable format and distributed. The program supply apparatus program may be stored in the ROM 202 instead of the HD 204.

[0075]

As the above-described computer readable recording medium, a compact disc recordable (CD-R), a digital versatile disk (DVD), or a Blue-ray disc is applicable, for example.

[0076]

<<Functional structure of embodiment>>

As illustrated in Fig. 7, the transmission terminal 10,

the relaying apparatus 30, and the transmission management apparatus 50 are coupled such that they can transmit data through the transmission network 2. The program supply apparatus 90 illustrated in Fig. 1 is omitted in Fig. 7 because the program supply apparatus 90 does not directly relate to data transmission in a video conference.

[0077]

<Functional structure of transmission terminal>

The transmission terminal 10 includes a transmitting-receiving unit 11, an operation input reception unit 12, a login request unit 13, an image capturing unit 14, a sound input unit 15a, a sound output unit 15b, a display control unit 17, and a storage-read processing unit 19. The above-described components are achieved by the CPU 101 that executes the transmission terminal control program loaded on the RAM 103 from the flash memory 104. The transmission terminal 10 includes a storage unit 1000 that is structured by the RAM 103 and the flash memory 104.

[0078]

Functional structures of transmission terminal

The transmitting-receiving unit 11, which is achieved by the CPU 101 and the network I/F 111, transmits and receives various types of data and information between itself and other transmission terminals 10 or the apparatuses 30, 50, and 90 through the transmission network 2. The transmitting-receiving unit 11 functions as the transmitting unit and the receiving unit of the transmission terminal 10.

[0079]

The transmitting-receiving unit 11 starts receiving state information indicating the states of the transmission terminals 10 that are candidates of a connecting destination in a video conference from the transmission

management apparatus 50 before starting the video conference with a desired destination terminal.

[0080]

The state information indicates not only an operation state of whether each transmission terminal 10 is online or offline but also a detailed operation state such as whether each transmission terminal 10 is online and transmission is enabled or whether each transmission terminal 10 is online and in a transmission operation.

[0081]

In addition, the state information indicates not only the operation state of each transmission terminal 10 but also various states in the transmission terminal 10. For example, a state in which the cable 120c is come off from the transmission terminal 10, a state in which the transmission terminal 10 outputs sounds but no images, and a state in which the transmission terminal 10 outputs no sounds (MUTE). For easy understanding, a case is described in which the state information indicates the operation state of each transmission terminal 10, in the following descriptions.

[0082]

The operation input reception unit 12, which is achieved by the CPU 101, the operation button 108, and the power switch 109, receives various types of inputs from a user. For example, once a user turns on the power switch 109, the operation input reception unit 12 receives the power ON operation and causes the power supply of the transmission terminal 10 to be turned on.

[0083]

The login request unit 13, which is achieved by the CPU 101, once the power ON operation is received, transmits login request information indicating a request for login

and the current IP address of the transmission terminal 10 to the transmission management apparatus 50 from the transmitting-receiving unit 11 through the transmission network 2.

[0084]

When the user switches the power switch 109 from the ON state to the OFF state, the operation input reception unit 12 completely turns off the power supply of the transmission terminal 10 after the transmitting-receiving unit 11 transmits the state information indicating that the power supply is to be turned off to the transmission management apparatus 50. As a result, the transmission management apparatus 50 can grasp the fact that the power supply of the transmission terminal 10 has been turned off from the ON state.

[0085]

The image capturing unit 14, which is achieved by the CPU 101, the camera 112, and the image capturing device I/F 113, images a subject and outputs the resulting image data to the transmitting-receiving unit 11. The camera 112 functions as an imaging apparatus and the image capturing device I/F 113 functions as an image data input unit.

[0086]

The sound input unit 15a, which is achieved by the CPU 101 and the sound input-output I/F 116, functions as a sound data input unit. The sound input unit 15a, to which a sound signal representing a sound collected by the microphone 114 is input, converts the received sound signal into sound data.

[0087]

The sound output unit 15b, which is achieved by the CPU 101 and the sound input-output I/F 116, converts sound data into a sound signal and outputs the converted sound

signal to the speaker 115 so as to cause the speaker 115 to output a sound.

[0088]

The display control unit 17, which is achieved by the CPU 101 and the display I/F 117, combines pieces of image data that have different resolutions and are received by the transmitting-receiving unit 11, and transmits the combined image data to the display 120 so as to cause the display 120 to display an image represented by the image data thereon.

[0089]

The display control unit 17 transmits information relating to a destination list received by the transmitting-receiving unit 11 from the transmission management apparatus 50 to the display 120 so as to cause the display 120 to display the destination list thereon.

[0090]

The storage-read processing unit 19, which is achieved by the CPU 101 and the SSD 105, stores various types of data in the storage unit 1000 and reads various types of data stored in the storage unit 1000.

[0091]

The storage unit 1000 stores therein an identifier (hereinafter referred to as a "terminal ID") and a password for identifying the transmission terminal 10, for example. In addition, the storage unit 1000 is also used as a receiving buffer for image data and sound data that are received when a video conference is held with a destination terminal.

[0092]

The terminal ID in the embodiment indicates information used to uniquely identify the transmission terminal 10, such as languages, characters, symbols, or

various signs. The terminal ID may be information obtained by combining at least two of the languages, characters, symbols, and various signs.

[0093]

<Functional structure of transmission management apparatus>

The transmission management apparatus 50 includes a transmitting-receiving unit 51, a terminal authentication unit 52, a state management unit 53, a terminal extraction unit 54, a terminal state acquisition unit 55, and a storage-read processing unit 59. The above-described components are achieved by the CPU 201 that executes the transmission management program loaded on the RAM 203 from the HD 204. The transmission management apparatus 50 includes a storage unit 5000 composed of the HD 204.

[0094]

Terminal authentication management table

In the storage unit 5000, a terminal authentication management DB 5002 having a terminal authentication management table illustrated in Fig. 8 is structured. In the terminal authentication management table, passwords are managed in association with the respective terminal IDs of all of the transmission terminals 10 managed by the transmission management apparatus 50. For example, the terminal authentication management table illustrated in Fig. 8 indicates that the terminal ID of the transmission terminal 10aa is "01aa" and the password of the transmission terminal 10aa is "aaaa".

[0095]

Terminal management table

In the storage unit 5000, a terminal management DB 5003 having a terminal management table illustrated in Fig. 9 is structured. The terminal management DB 5003 functions as a terminal management table storage unit.

[0096]

In the terminal management table, an identification name of the transmission terminal 10 (hereinafter referred to as a "terminal name"), an operation state of the transmission terminal 10, a receiving date at which the login request information to login the transmission system 1 is received by the transmission management apparatus 50, and the IP address of the transmission terminal 10 are managed in association with each other for each terminal ID of the transmission terminals 10.

[0097]

For example, the terminal management table illustrated in Fig. 9 indicates that the terminal name is "AA terminal, Tokyo business office, Japan", the operation state is "online (transmission is enabled)", the data at which the login request information was received by the transmission management apparatus 50 is "13:40 on November 10, 2009", and the IP address is "1.2.1.3" for the transmission terminal 10aa having the terminal ID of "01aa".

[0098]

The terminal ID of the terminal management table is uniquely allocated when the transmission terminal 10 is registered in the transmission system 1. The terminal name is registered or changed by an administrator of the transmission management apparatus 50. The terminal name may be registered or changed in response to a request made from the transmission terminal 10 to the transmission management apparatus 50.

[0099]

The operation state of "online (transmission is enabled)" indicates that the transmission terminal 10 has logged in the transmission system 1 but is not attending a video conference. The operation state of "online (in

transmission)" indicates that the transmission terminal 10 has logged in the transmission system 1 and is attending a video conference. The operation state of "offline" indicates that the transmission terminal 10 has not logged in the transmission system 1.

[0100]

Destination list management table

Furthermore, in the storage unit 5000, a destination list management DB 5004 having a destination list management table illustrated in Fig. 10 is structured. The destination list management DB 5004 functions as a destination list management table storage unit.

[0101]

In the destination list management table, all of the terminal IDs of the destination terminals registered as the candidates of the destination terminal are managed in association with the terminal ID of the request source terminal that requests a start of a video conference.

[0102]

For example, the destination list management table illustrated in Fig. 10 indicates that the candidates of the destination terminal to which the transmission terminal 10aa having the terminal ID of "01aa" requests a start of a video conference are the transmission terminal 10ab having the terminal ID of "01ab", the transmission terminal 10ba having the terminal ID of "01ba", and the transmission terminal 10db having the terminal ID of "01db". The candidate of the destination terminal is added or deleted in response to a request made from the transmission terminal 10 to the transmission management apparatus 50.

[0103]

Functional structures of transmission management apparatus

The transmitting-receiving unit 51, which is achieved

by the CPU 201 and the network I/F 209, transmits and receives various types of data and information between itself and other transmission terminals 10 or the apparatuses 30 and 90 through the transmission network 2.

[0104]

The terminal authentication unit 52, which is achieved by the CPU 201, searches the terminal authentication management DB 5002 of the storage unit 5000 by using the terminal ID and the password that are included in the login request information received through the transmitting-receiving unit 51 as searching keys, and performs terminal authentication by determining whether the same terminal ID and password are managed in the terminal authentication management DB 5002.

[0105]

The state management unit 53, which is achieved by the CPU 201, stores the operation state, the receiving date at which the transmission management apparatus 50 has received the login request information, and the IP address in the terminal management DB 5003 (refer to Fig. 9) and manages them in association with the terminal ID of the request source terminal so as to manage the operation state of the request source terminal that makes the login request.

[0106]

The state management unit 53 changes the operation state of the transmission terminal 10 in the terminal management DB 5003 (refer to Fig. 9) from online to offline in accordance with the state information that is sent from the transmission terminal 10 and indicates that the power supply is to be turned off when a user turns off the power switch 109 of the transmission terminal 10 from the ON state.

[0107]

The terminal extraction unit 54, which is achieved by the CPU 201, searches the destination list management DB 5004 (refer to Fig. 10) by using the terminal ID of the request source terminal that has made the login request as a searching key, and extracts the terminal IDs of the candidates of the destination terminal of the request source terminal.

[0108]

In addition, the terminal extraction unit 54 searches the destination list management DB 5004 (refer to Fig. 10) by using the terminal ID of the request source terminal that has made the login request as a searching key, and extracts the terminal IDs of the other request source terminals that register the terminal ID of the request source terminal as the candidate of the destination terminal thereof.

[0109]

The terminal state acquisition unit 55, which is achieved by the CPU 201, searches the terminal management DB 5003 (refer to Fig. 9) by using the terminal IDs of the candidates of the destination terminal extracted by the terminal extraction unit 54 as searching keys and reads the operation state for each detected terminal ID.

[0110]

As a result, the terminal state acquisition unit 55 can acquire the operation states of the candidates of the destination terminal of the request source terminal that has made the login request. Furthermore, the terminal state acquisition unit 55 searches the terminal management DB 5003 by using the terminal IDs extracted by the terminal extraction unit 54 as searching keys and acquires the operation state of the request source terminal that has made the login request.

[0111]

The storage-read processing unit 59, which is achieved by the CPU 201 and the HDD 205, stores various types of data in the storage unit 5000 and reads various types of data stored in the storage unit 5000.

[0112]

<<Processing or operation of embodiment>>

Operation of the transmission system 1 according to the embodiment is described below. Fig. 11 is a sequence diagram illustrating preparatory stage operation until the transmission terminal 10 reaches a preparatory state to attend a video conference. Fig. 11 illustrates an example in which the transmission terminal 10aa reaches the preparatory state. In the preparatory stage operation, various types of information are transmitted and received in the management information session SEI (refer to Fig. 2).

[0113]

When a user of the transmission terminal 10aa turns on the power switch 109 of the transmission terminal 10aa, the operation input reception unit 12 receives the power ON operation and causes the power supply to be turned on (step S21). The login request unit 13, once the power ON operation is received, transmits the login request information indicating a request for login to the transmission management apparatus 50 from the transmitting-receiving unit 11 of the transmission terminal 10aa through the transmission network 2 (step S22).

[0114]

The login request information includes the terminal ID and the password to identify the transmission terminal 10aa serving as a login request source. The terminal ID and the password are read from the storage unit 1000 by the storage-read processing unit 19.

[0115]

Upon receiving the login request information transmitted from the transmission terminal 10aa, the transmission management apparatus 50 can grasp the IP address of the transmission terminal 10aa serving as a transmission side.

[0116]

Then, the terminal authentication unit 52 of the transmission management apparatus 50 searches the terminal authentication management DB 5002 of the storage unit 5000 (refer to Fig. 8) by using the terminal ID and the password that are included in the login request information received through the transmitting-receiving unit 51 as searching keys, and performs terminal authentication by determining whether the same terminal ID and password as the searching keys are managed in the terminal authentication management DB 5002 (step S23).

[0117]

If the terminal authentication unit 52 determines that the same terminal ID and password as the searching keys are not managed, i.e., if it is determined that the login request is not transmitted from the transmission terminal 10 having use authority, the transmitting-receiving unit 51 transmits authentication result information indicating the authentication result obtained by the terminal authentication unit 52 to the transmission terminal 10aa that has made the login request through the transmission network 2. Thereafter, the operation of the preparatory stage ends.

[0118]

On the other hand, if the terminal authentication unit 52 determines that the same terminal ID and password as the searching keys are managed, i.e., it is determined that the

login request is transmitted from the transmission terminal 10 having use authority, the state management unit 53 stores the terminal ID, the operation state, the receiving date of the login request information, and the IP address of the transmission terminal 10aa in the terminal management DB 5003 (refer to Fig. 9) in association with one another (step S24).

[0119]

As a result, as illustrated in Fig. 9, the terminal management table manages the terminal ID "01aa", the operation state "online (transmission is enabled)", the receiving date "13:40 on November 10, 2009", and the IP address "1.2.1.3" of the transmission terminal 10aa in association with one another.

[0120]

Then, the transmitting-receiving unit 51 of the transmission management apparatus 50 transmits the authentication result information indicating the authentication result obtained by the terminal authentication unit 52 to the transmission terminal 10aa that has made the login request through the transmission network 2 (step S25).

[0121]

Then, the terminal extraction unit 54 of the transmission management apparatus 50 searches the destination list management DB 5004 (refer to Fig. 10) by using the terminal ID "01aa" of the transmission terminal 10aa that has made the login request as a searching key, and extracts the terminal IDs of the candidates of the destination terminal of the transmission terminal 10aa (step S26).

[0122]

In this case, the terminal IDs "01ab", "01ba", and

"01db" of the transmission terminals 10ab, 10ba, and 10db that are the destination terminals of the terminal ID "01aa" of the transmission terminal 10aa are extracted.
[0123]

Then, the terminal state acquisition unit 55 of the transmission management apparatus 50 searches the terminal management DB 5003 (refer to Fig. 9) by using the terminal IDs "01ab", "01ba", and "01db" of the candidates of the destination terminal extracted by the terminal extraction unit 54 as searching keys and reads the operation states of the terminal IDs extracted by the terminal extraction unit 54 as "offline", "online (transmission is enabled)", and "online (in transmission)". As a result, the terminal state acquisition unit 55 acquires the respective operation states of the transmission terminals 10ab, 10ba, and 10db (step S27).

[0124]

Then, the transmitting-receiving unit 51 of the transmission management apparatus 50 transmits, to the transmission terminal 10aa through the transmission network 2, the terminal IDs "01ab", "01ba", and "01db" used as the searching keys at step S27, and the destination state information including the operation states of the respective transmission terminals 10ab, 10ba, and 10db corresponding to the respective terminal IDs, which are "offline", "online (transmission is enabled)", and "online (in transmission)" (step S28).

[0125]

As a result, the transmission terminal 10aa can grasp the current operation states, each of which is "offline", "online (transmission is enabled)", and "online (in transmission)", of the transmission terminals 10ab, 10ba, and 10db that are the candidates of the destination

terminal.

[0126]

Furthermore, the terminal extraction unit 54 of the transmission management apparatus 50 searches the destination list management DB 5004 (refer to Fig. 10) by using the terminal ID "01aa" of the transmission terminal 10aa that has made the login request as a searching key, and extracts the terminal IDs of the other transmission terminals that register the terminal ID "01aa" of the transmission terminal 10aa as the candidate of the destination terminal (step S29). For example, in the destination list management table illustrated in Fig. 10, the terminal IDs "01ab", "01ba", and "01db" are extracted.

[0127]

Then, the state management unit 53 of the transmission management apparatus 50 searches the terminal management DB 5003 (refer to Fig. 9) by using the terminal ID "01aa" of the transmission terminal 10aa that has made the login request as a searching key and acquires the operation state, which is "online (transmission is enabled)", of the transmission terminal 10aa that has made the login request (step S30).

[0128]

Then, the transmitting-receiving unit 51 of the transmission management apparatus 50 transmits destination state information including the terminal ID "01aa" of the transmission terminal 10aa and the operation state "online (transmission is enabled)" that are acquired at step S30 to the transmission terminals 10ba and 10db each operation state of which is "online" in the terminal management DB 5003 (refer to Fig. 9) among the transmission terminals 10ab, 10ba, and 10db that are identified with the terminal IDs "01ab", "01ba", and "01db" extracted at step S29 (step

S31-1 and step S31-2).

[0129]

When transmitting the destination state information to the transmission terminals 10ba and 10db, the transmitting-receiving unit 51 refers to the IP addresses of the transmission terminals managed in the terminal management table illustrated in Fig. 9 using the terminal IDs "01ba" and "01db".

[0130]

As a result, the terminal ID "01aa" and the operation state "online (transmission is enabled)" of the transmission terminal 10aa that has made the login request can be transmitted to the transmission terminals 10db and 10ba that can perform transmission to the transmission terminal 10aa that has made the login request as the destination.

[0131]

When step S28 of the preparatory stage operation is complete, the display control unit 17 of the transmission terminal 10aa highlights, on the display 120, the information of the terminals attending the video conference, i.e., the transmission terminal 10db operation state of which is "online (in transmission)" or "online (transmission is enabled)", from the information of the destination list displayed on the display 120, for example. As a result, the display control unit 17 allows a user to recognize the transmission terminal 10 attending or capable of attending the video conference.

[0132]

Fig. 12 is a sequence diagram illustrating conference attendance operation until the transmission terminal 10 reaches an attendance state in which the transmission terminal 10 is attending a video conference. Fig. 12

illustrates an example in which the transmission terminal 10aa reaches the attendance state. In the conference attendance operation, various types of information are transmitted and received in the management information session SEI (refer to Fig. 2).

[0133]

Once a user presses the operation button 108 to select an attendance at a video conference, the operation input reception unit 12 receives a request for an attendance at the video conference held with the transmission terminal 10db (step S41).

[0134]

In response to the request, the transmitting-receiving unit 11 of the transmission terminal 10aa transmits attendance request information indicating the attendance at the video conference and including the terminal ID "01aa" of the transmission terminal 10aa and the terminal ID "01db" of the transmission terminal 10db to the transmission management apparatus 50 (step S42).

[0135]

As a result, the transmitting-receiving unit 51 of the transmission management apparatus 50 receives the attendance request information and can confirm the IP address "1.2.1.3" of the transmission terminal 10aa serving as a transmission source.

[0136]

Then, the state management unit 53 of the transmission management apparatus 50 searches by using the terminal ID "01aa" of the transmission terminal 10aa included in the attendance request information as a searching key and sets "online (in transmission)" as the operation state of the transmission terminal 10aa that has made the attendance request (step S43).

[0137]

Then, the transmitting-receiving unit 51 of the transmission management apparatus 50 transmits start request information including the terminal ID "01aa" of the transmission terminal 10aa to the transmission terminal 10db through the transmission network 2 (step S44). As a result, the transmission terminal 10db can grasp which transmission terminal 10 has requested the attendance at the video conference.

[0138]

In the terminal management DB 5003 illustrated in Fig. 9, the operation state of the transmission terminal 10cb is "online (in transmission)". Accordingly, the transmitting-receiving unit 51 of the transmission management apparatus 50 transmits the start request information including the terminal ID "01aa" of the transmission terminal 10aa to the transmission terminal 10cb through the transmission network 2. Detailed description thereof is, however, omitted herein for easy understanding of the invention.

[0139]

Then, the transmission terminal 10db transmits receiving completion information indicating the completion of the receiving of the start request information to the transmission management apparatus 50 from the transmitting-receiving unit 11 through the transmission network 2 (step S45).

[0140]

Then, the transmitting-receiving unit 51 of the transmission management apparatus 50 transmits relay start request information indicating a request for starting a relay to the relaying apparatus 30 through the transmission network 2 (step S46). The relay start request information includes the IP address "1.2.1.3" of the transmission

terminal 10aa and the IP address "1.3.2.4" of the transmission terminal 10db.

[0141]

As a result, the relaying apparatus 30 establishes a session for transmitting three pieces of image data of low resolution, medium resolution, and high resolution and sound data between the transmission terminals 10aa and 10db (step S47). In this way, the transmission terminal 10aa can attend the video conference held with the transmission terminal 10db.

[0142]

Meanwhile, the transmitting-receiving unit 51 of the transmission management apparatus 50 casts terminal state change information including the terminal ID "01aa" and the operation state "online (in transmission)" of the transmission terminal 10aa into each transmission terminal 10 registered in the terminal management DB 5003 (refer to Fig. 9) (step S48). As a result, each transmission terminal 10 having received the terminal state change information can store and display the operation state of the transmission terminal 10aa having the terminal ID "01aa" if needed.

[0143]

Fig. 13 is a sequence diagram illustrating data transmission operation between the transmission terminals 10. In the data transmission operation illustrated in Fig. 13, image data and sound data are transmitted and received in the image/sound data session SED (refer to Fig. 2).

[0144]

Once the session is established between the transmission terminals 10aa and 10db as described with reference to Fig. 12, the transmission terminal 10aa transmits, to the relaying apparatus 30 through the

transmitting-receiving unit 51, the image data taken by the image capturing unit 14 and sound data into which the sound input unit 15a converts a received sound signal (step S60).
[0145]

Upon receiving the image data and the sound data from the transmission terminal 10aa, the relaying apparatus 30 transmits the received image data and sound data to each of the transmission terminals 10aa and 10db that are attending the video conference (step S61-1 and step S61-2).
[0146]

Upon receiving the image data and the sound data from the relaying apparatus 30, each of the transmission terminals 10aa and 10db allows the display control unit 17 to cause the display 120 to display the image represented by the received image data and allows the sound output unit 15b to cause the speaker 115 to output the sound represented by the received sound data (step S62-1 and step S62-2).
[0147]

Then, the transmission terminal 10db transmits, to the relaying apparatus 30 through the transmitting-receiving unit 51, image data taken by the image capturing unit 14 and sound data into which the sound input unit 15a converts a received sound signal (step S63).
[0148]

Upon receiving the image data and the sound data from the transmission terminal 10db, the relaying apparatus 30 transmits the received image data and sound data to each of the transmission terminals 10aa and 10db that are attending the video conference (step S64-1 and step S64-2).
[0149]

Upon receiving the image data and the sound data from the relaying apparatus 30, each of the transmission

terminals 10aa and 10db allows the display control unit 17 to cause the display 120 to display the image represented by the received image data and allows the sound output unit 15b to cause the speaker 115 to output the sound represented by the received sound data (step S65-1 and step S65-2).

[0150]

In this way, the transmission terminals 10aa and 10db can have a video conference therebetween through the relaying apparatus 30. Fig. 13 illustrates two transmission terminals 10, i.e., the transmission terminals 10aa and 10db, attending the video conference for easy understanding. Even if the number of transmission terminals 10 attending the video conference is equal to or more than three, image data and sound data are transmitted in the same manner as the data transmission operation illustrated in Fig. 13.

[0151]

An image display of the transmission terminal 10 is described below. In the embodiment, the display control unit 17 has two display modes of an all-image display mode and an information display mode. Switching of the display modes is performed in accordance with operation of the operation button 108, for example.

[0152]

In the all-image display mode as illustrated in Fig. 14, the display control unit 17 of the transmission terminal 10 causes the display 120 to display all of the images transmitted from each transmission terminal 10 attending a video conference.

[0153]

In the display screen illustrated in Fig. 14, a first image area 500 having a relatively large area and a

plurality of second image areas 510 each having a relatively small area are allocated. For example, images represented by pieces of image data transmitted from the transmission terminals 10 attending the video conference are displayed in the second image areas 510 while an image represented by image data of a main transmission terminal among the transmission terminals 10 attending the video conference is displayed in the first image area 500.

[0154]

For example, the display control unit 17 specifies a transmission terminal that is the transmission source of sound data representing the voice in the received sound data as a major terminal among the transmission terminals 10 attending the video conference. A voice stream is detected for each piece of the received sound data. The sound data representing the voice is sound data determined that it has the voice stream. The detection of the voice stream can be achieved by using known techniques (e.g., refer to Non-Patent Literature 1).

[0155]

On the other hand, in the information display mode as illustrated in Fig. 15, the display control unit 17 of the transmission terminal 10 causes the display 120 to display terminal information including at least the terminal names and terminal IDs of the transmission terminals 10 attending the video conference.

[0156]

To the display screen illustrated in Fig. 15, an image display area 520 for displaying an image and a terminal information display area 530 for displaying the terminal information are allocated. For example, in the terminal information display area 530, pieces of the terminal information of the transmission terminals 10 attending the

video conference are displayed as a list.

[0157]

The terminal information having no terminal name displayed among the pieces of terminal information displayed in the list represents the transmission terminal 10 that is not registered as the candidate of the destination terminal of the terminal serving as a transmission terminal in the destination list management DB 5004 (refer to Fig. 10).

[0158]

For example, in the display screen illustrated in Fig. 15, the terminal name of the transmission terminal 10db is displayed because the transmission terminal 10db is registered in the destination list management DB 5004 as the candidate of the destination terminal of the transmission terminal 10aa while the terminal name of the transmission terminal 10cb is not displayed because the transmission terminal 10cb is not registered in the destination list management DB 5004 as the candidate of the destination terminal of the transmission terminal 10aa.

[0159]

In the image display area 520, an image represented by image data of a major transmission terminal is displayed among the transmission terminals 10 attending the video conference. For example, the display control unit 17 specifies a transmission terminal that is the transmission source of sound data representing the voice in the received sound data, as a major terminal among the transmission terminals 10 attending the video conference.

[0160]

Fig. 16 is a sequence diagram illustrating terminal information display operation in which terminal information to be displayed in the terminal information display area

530 is displayed in the terminal information display area 530 when the display mode is switched to the information display mode in the transmission terminal 10. In the terminal information display operation illustrated in Fig. 16, various types of information are transmitted and received in the management information session SEI.

[0161]

First, the transmission terminal 10 transmits a terminal information request signal indicating a request of the terminal information of the transmission terminal attending a video conference to the transmission management apparatus 50 (step S70). Upon receiving the terminal information request signal, the terminal state acquisition unit 55 of the transmission management apparatus 50 searches the terminal management DB 5003 (refer to Fig. 9) of the storage unit 5000 by using the IP address of the transmission source of the terminal information request signal as a searching key and acquires the terminal ID of the transmission terminal that transmits the terminal information request signal (step S71).

[0162]

Then, the terminal state acquisition unit 55 searches the terminal management DB 5003 for the terminal ID and the terminal name with the operation condition "online (in transmission)" (step S72). In the embodiment, the terminal state acquisition unit 55 detects the terminal IDs "01aa", "01cb", and "01db". The operation state of the transmission terminal having the terminal ID "01aa" is set as "online (in transmission)" at step S43.

[0163]

Then, the terminal state acquisition unit 55 searches the destination list management DB 5004 (refer to Fig. 10) of the storage unit 5000 by using the terminal ID detected

at step S71 ("01aa" in the embodiment) as a searching key and acquires the terminal IDs of the candidates of the destination terminal of the transmission source of the terminal information request signal (step S73).

[0164]

For example, when the terminal ID of the transmission terminal that transmits the terminal information request signal is "01aa", the terminal IDs "01ab", "01ba", and "01db" are acquired by the terminal state acquisition unit 55.

[0165]

Then, the terminal state acquisition unit 55 determines whether each of the terminal IDs acquired at step S72 is included in the terminal ID of the transmission source of the terminal information request signal or the terminal IDs acquired at step S73. If it is determined that the terminal ID is included, the terminal state acquisition unit 55 causes the transmitting-receiving unit 51 to reply the included terminal ID and the terminal name to the transmission source of the terminal information request signal. If it is determined that the terminal ID is not included, the terminal state acquisition unit 55 causes the transmitting-receiving unit 51 to reply only the terminal ID to the transmission source of the terminal information request signal (step S74).

[0166]

For example, when the terminal ID of the transmission terminal that transmits the terminal information request signal is "01aa", the terminal IDs "01aa" and "01db" and the terminal names "AA terminal, Tokyo business office, Japan" and "DB terminal, Washington, D.C. business office, USA" of the transmission terminals 10aa and 10db, and the terminal ID "01cb" of the transmission terminal 10cb are

transmitted to the transmission terminal 10aa that is the transmission source of the terminal information request signal.

[0167]

The display control unit 17 of the transmission terminal 10 having received the reply displays the reply contents in the terminal information display area 530 as the display screen illustrated in Fig. 15 (step S75).

[0168]

<<Major effect of embodiment>>

As described above, the transmission system 1 according to the embodiment causes the transmission management apparatus 50 to reply the information of the transmission terminals 10 attending a video conference. As a result, a user of each of the transmission terminals 10 can grasp which transmission terminal 10 is attending the video conference regardless of the number of transmission terminals 10 attending the video conference.

[0169]

Accordingly, the transmission system 1 enables a user to know the other party at a video conference without requiring the user to ask the other party in conversation. As a result, time taken for the video conference can be reduced. In the transmission system 1, the terminal name of the transmission terminal that is not registered as the destination is not displayed, enabling the attendance of an unknown party at the video conference to be informed. As a result, the video conference can proceed with careful attention to discussion contents.

[0170]

In the transmission system 1, image data of a major transmission terminal remains displayed even when terminal information is displayed on the display 120. As a result,

a user can grasp a situation of a site that currently leads the video conference.

[0171]

Supplemental explanation of embodiment

The relaying apparatus 30, the transmission management apparatus 50, and the program supply apparatus 90 in the embodiment may be structured by a single computer. The units (function or means) of them may be divided and the divided units may be structured by a plurality of computers each allocated for any unit.

[0172]

When the program supply apparatus 90 is structured by a single computer, a program transmitted by the program supply apparatus 90 may be transmitted as a plurality of divided modules or transmitted without being divided.

[0173]

When the program supply apparatus 90 is structured by a plurality of computers, a program may be transmitted from the computers as a plurality of divided modules.

[0174]

The recording medium, such as CD-ROM, in which the transmission terminal control program, the relaying apparatus program, and the transmission management program of the embodiment are stored, the HD 204 that stores therein the programs, and the program supply apparatus 90 including the HD 204 are used as program products when the transmission terminal control program, the relaying apparatus program, and the transmission management program are provided to a user and the like domestically or overseas.

[0175]

As an example of quality of an image represented by image data relayed by the relaying apparatus 30, attention

is paid on the resolution of the image represented by the image data and the resolution is managed. The image quality is not limited to the resolution. As other examples of quality, attention may be paid on depth of image quality of the image represented by the image data, a sampling frequency of sound in sound data, and a bit length of sound in sound data and the quality may be managed. Sound data may be transmitted and received by being divided into three pieces of data having different resolutions (high resolution, medium resolution, and low resolution).

[0176]

In Fig. 9, the IP address of the transmission terminal 10 is managed. However, the item to be managed is not limited to the IP address. Any information can be used as long as it can be used to identify the transmission terminal 10 on the transmission network 2. For example, a fully qualified domain name (FQDN) of the transmission terminal 10 may be managed. In this case, the IP address corresponding to the FQDN is acquired by a known domain name system (DNS) server.

[0177]

In the embodiment, the video conference system is described as an example of the transmission system 1. However, the transmission system 1 is not limited to be applied to the video conference system. The transmission system 1 may be applicable to a telephone system such as an Internet Protocol (IP) telephone and an Internet telephone.

[0178]

The transmission system 1 may be a car navigation system. In this case, the transmission terminal 10 on one side corresponds to a car navigation system mounted on a vehicle while the transmission terminal 10 on the other side corresponds to a management terminal or a management

server of a management center that manages the car navigation, or another car navigation system mounted on another vehicle. In the transmission system 1, the transmission terminals 10 may be structured with cell phones.

[0179]

In the embodiment, image data and sound data are described as examples of the content data. However, content data is not limited to the image data and the sound data. Touch data may be applicable. In this case, a sense of touch obtained by a user at a transmission terminal on one side is transmitted to another transmission terminal on the other side.

[0180]

The content data may be olfactory (smell) data. In this case, an aroma (smell) at a transmission terminal on one side is transmitted to another transmission terminal on the other side. The content data may be at least one piece of image data, sound data, touch data, and olfactory data.

[0181]

In the embodiment, the video conference is held by using the transmission system 1. However, the transmission system 1 is not limited to be used for the video conference. The transmission system 1 may be used for general conversations among family members or friends or information supply in one direction.

[Explanations of Letters or Numerals]

[0182]

- 1 Transmission system
- 10 Transmission terminal
- 11 Transmitting-receiving unit (transmitting unit, receiving unit)
- 12 Operation input reception unit

15a Sound input unit (sound data input unit)
15b Sound input unit
17 Display control unit
19 Storage-read processing unit
30 Relaying apparatus
50 Transmission management apparatus
51 Transmitting-receiving unit (transmitting unit,
receiving unit)
52 Terminal authentication unit
53 State management unit
54 Terminal extraction unit
55 Terminal state acquisition unit
59 Storage-read processing unit
70 Router
90 Program supply apparatus
112 Camera (image capturing device)
113 Image capturing device I/F (image data input unit)
114 Microphone (sound collector)
120 Display (display device)
1000 Storage unit
5000 Storage unit
5002 Terminal authentication management DB
5003 Terminal management DB (terminal management table
storage unit)
5004 Destination list management DB (destination list
management table storage unit)
[Prior Art documents]
[Patent Literatures]
[0183]
[Patent Literature 1] Japanese Patent No. 3308563
[Non-Patent Literatures]
[0184]
[Non-Patent Literature 1] NIIMI, Yasuhisa. Speech

Recognition. Japan. Kyoritsu Publishing, Co. 1979. pages 68
to 72

[Type of Document] Claim(s)

[Claim 1]

A transmission management apparatus for managing transmission states of a plurality of transmission terminals, the transmission management apparatus comprising:

a terminal management table storage unit configured to store therein a terminal management table in which terminal information including an identifier and an identification name of each of the transmission terminals is managed;

a receiving unit configured to receive a terminal information request signal indicating a request for information for identifying a transmission terminal that is in a transmission state with the transmission terminal;

a terminal state acquisition unit configured to acquire the information for identifying the transmission terminal that is in a transmission state with the transmission terminal, from the terminal management table in response to the terminal information request signal; and

a transmitting unit configured to transmit the information acquired by the terminal state acquisition unit to the transmission terminal that is a source having transmitted the terminal information request signal.

[Claim 2]

The transmission management apparatus according to claim 1, further comprising a destination list management table storage unit configured to store therein a destination list management table in which a destination list including the identifiers of the transmission terminals that have been already registered is managed for each of the transmission terminals, wherein

the terminal state acquisition unit acquires, from among the transmission terminals that are in a transmission

state with the transmission terminal that is a source having transmitted the terminal information request signal, an identifier and an identification name, included in the terminal information, of a transmission terminal that is registered in the destination list for the transmission terminal that is the source having transmitted the terminal information request signal, and acquires an identifier, included in the terminal information, of a transmission terminal that is not registered in the destination list.

[Claim 3]

A transmission terminal that performs transmission with at least one transmission terminal through a network connected to a transmission management apparatus for managing transmission states of a plurality of transmission terminals, the transmission terminal comprising:

a transmitting unit configured to transmit a terminal information request signal indicating a request for information for identifying a transmission terminal that is in a transmission state with the transmission terminal, to the transmission management apparatus;

a receiving unit configured to receive information that is transmitted from the transmission management apparatus in response to the terminal information request signal; and

a display control unit configured to cause a display unit to display the information received by the receiving unit.

[Claim 4]

The transmission terminal according to claim 3, further comprising an operation input reception unit configured to receive input from a user, wherein

the display control unit has two modes of an all-image display mode causing the display unit to display all images

transmitted from the transmission terminal that is in a transmission state and an information display mode causing the display unit to display the information transmitted from the transmission management apparatus, and

the display control unit switches between the two modes when the operation input reception unit receives the input, and transmits the terminal information request signal to the transmission management apparatus after switching the all-image display mode to the information display mode.

[Claim 5]

The transmission terminal according to claim 3 or 4, further comprising an image data input unit to which image data representing an image taken by an imaging device is input, wherein

the display control unit causes the display unit to display an image represented by the image data that is input to the image data input unit of a major transmission terminal among all the transmission terminals that are in a transmission state and transmitted, in addition to the information received by the receiving unit.

[Claim 6]

The transmission terminal according to claim 5, further comprising a sound data input unit to which sound data representing sound obtained by a sound collector is input, wherein

the display control unit identifies the transmission terminal from which the sound data representing voices input to the sound data input unit is transmitted is the major transmission terminal among all the transmission terminals that are in a transmission state.

[Claim 7]

A transmission system, comprising:

a plurality of transmission terminals; and
a transmission management apparatus configured to
manage transmission states of the transmission terminals,
wherein

the transmission management apparatus includes
a terminal management table storage unit
configured to store therein a terminal management table in
which terminal information is managed, the terminal
information including an identifier and an identification
name of each of the transmission terminals,

a receiving unit configured to receive a terminal
information request signal indicating a request for
information for identifying a transmission terminal that is
in a transmission state with the transmission terminal,

a terminal state acquisition unit configured to
acquire the information for identifying the transmission
terminal that is in a transmission state with the
transmission terminal that is a source having transmitted
the terminal information request signal, from the terminal
management table in response to the terminal information
request signal, and

a transmitting unit configured to transmit the
information acquired by the terminal state acquisition unit
to the transmission terminal that is the source having
transmitted the terminal information request signal, and

each transmission terminal includes

a transmitting unit configured to transmit a
terminal information request signal indicating a request
for information for identifying a transmission terminal
that is in a transmission state with the transmission
terminal, to the transmission management apparatus,

a receiving unit configured to receive the
information transmitted from the transmission management

apparatus in response to the terminal information request signal, and

a display control unit configured to cause a display unit to display the information received by the receiving unit.

[Claim 8]

A transmission management method for managing transmission states of a plurality of transmission terminals, wherein a terminal management table in which terminal information including an identifier and an identification name of each of the transmission terminals is managed is stored in a recording medium in advance, the transmission management method comprising:

a receiving step of receiving a terminal information request signal indicating a request for information for identifying a transmission terminal that is in a transmission state with the transmission terminal;

a terminal information acquiring step of acquiring the information for identifying the transmission terminal that is in a transmission state with the transmission terminal that is a source having transmitted the terminal information request signal, from the terminal management table, in response to the terminal information request signal; and

a transmitting step of transmitting the information acquired at the terminal information acquiring step to the transmission terminal that is the source having transmitted the terminal information request signal.

[Claim 9]

A transmission terminal control method using a transmission terminal that performs transmission with at least one transmission terminal through a network that is connected to a transmission management apparatus for

managing transmission states of a plurality of transmission terminals, comprising:

- a transmitting step of transmitting a terminal information request signal indicating a request for information for identifying a transmission terminal that is in a transmission state with the transmission terminal;

- a receiving step of receiving information that is transmitted from the transmission management apparatus in response to the terminal information request signal; and

- a display control step of causing a display unit to display the information received at the receiving step.

[Claim 10]

A transmission management program performed by a computer included in a transmission management apparatus for managing transmission states of a plurality of transmission terminals, wherein a terminal management table in which terminal information including an identifier and an identification name of each of the transmission terminals is managed is stored in a recording medium in advance, the transmission management program comprising:

- a receiving step of receiving a terminal information request signal indicating a request for information for identifying a transmission terminal that is in a transmission state with the transmission terminal;

- a terminal information acquiring step of acquiring the information for identifying the transmission terminal that is in a transmission state with the transmission terminal that is a source having transmitted the terminal information request signal, from the terminal management table, in response to the terminal information request signal; and

- a transmitting step of transmitting the information acquired at the terminal information acquiring step to the

transmission terminal that is the source having transmitted the terminal information request signal.

[Claim 11]

A transmission terminal control program performed by a computer included in a transmission terminal that performs transmission with at least one transmission terminal through a network that is connected to a transmission management apparatus for managing transmission states of a plurality of transmission terminals, the transmission terminal control program comprising:

a transmitting step of transmitting a terminal information request signal indicating a request for information for identifying a transmission terminal that is in a transmission state with the transmission terminal;

a receiving step of receiving information that is transmitted from the transmission management apparatus in response to the terminal information request signal; and

a display control step of causing a display unit to display the information received at the receiving step.

[Type of Document] Abstract

[Abstract]

[Problem to be solved] To provide a transmission management apparatus that enables users who use the respective transmission terminals to grasp which transmission terminal is attending a conference regardless of the number of transmission terminals attending the conference.

[Solution] A transmission management apparatus 50 for managing transmission states of transmission terminals 10 includes a terminal management DB 5003 that stores a terminal management table in which terminal information including an identifier and an identification name of the transmission terminal 10 is managed; a transmitting and receiving unit 51 configured to receive a terminal information request signal indicating a request for information for identifying a transmission terminal that is in a transmission state with the transmission terminal 10; and a terminal state acquisition unit 55 configured to acquire information for identifying the transmission terminal that is in a transmission state with the transmission terminal, from the terminal management table in response to the terminal information request signal. The information acquired by the terminal state acquisition unit 55 is transmitted to the transmission terminal 10 that is a source having transmitted the terminal information request signal through the transmitting and receiving unit 51.

[Chosen Drawing] Fig. 7

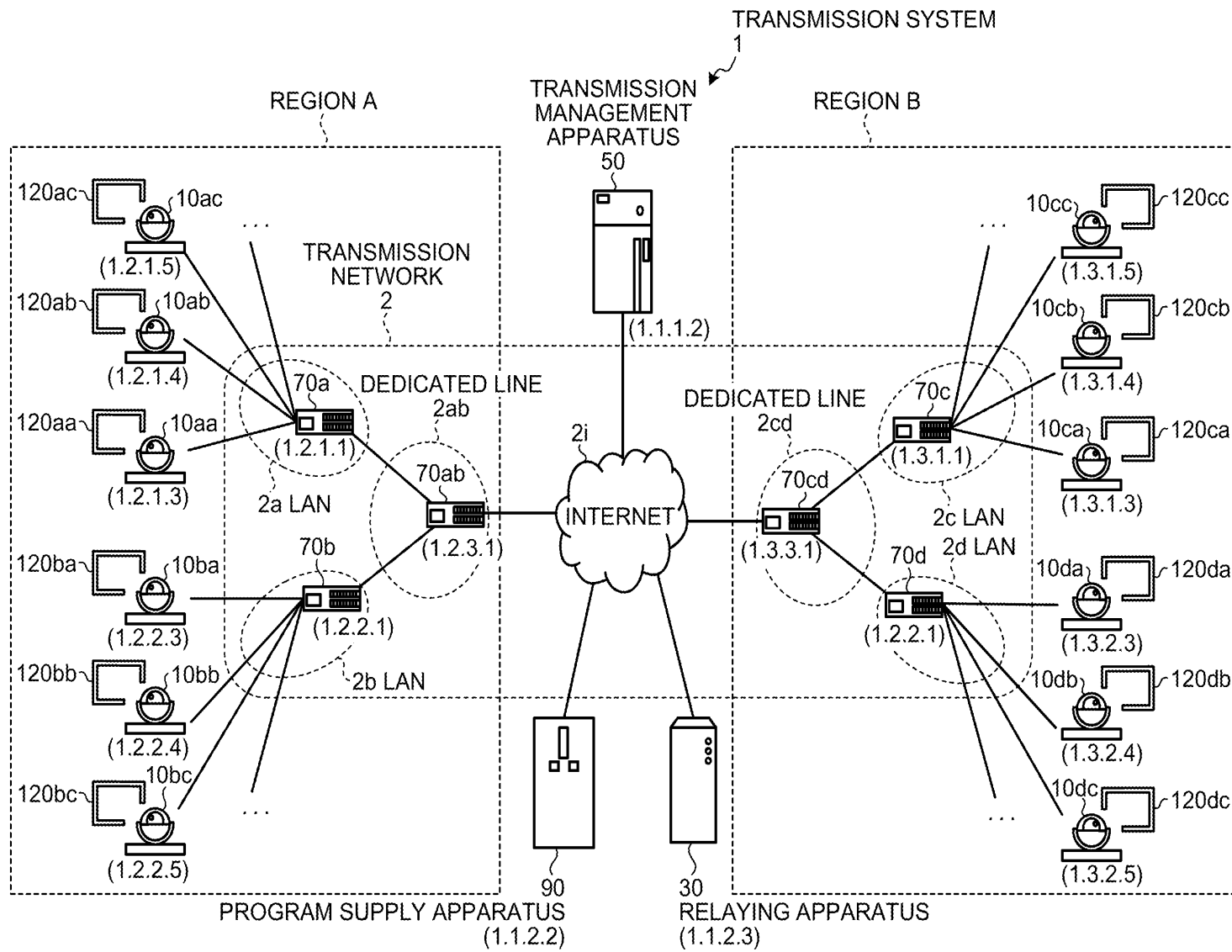


FIG. 1

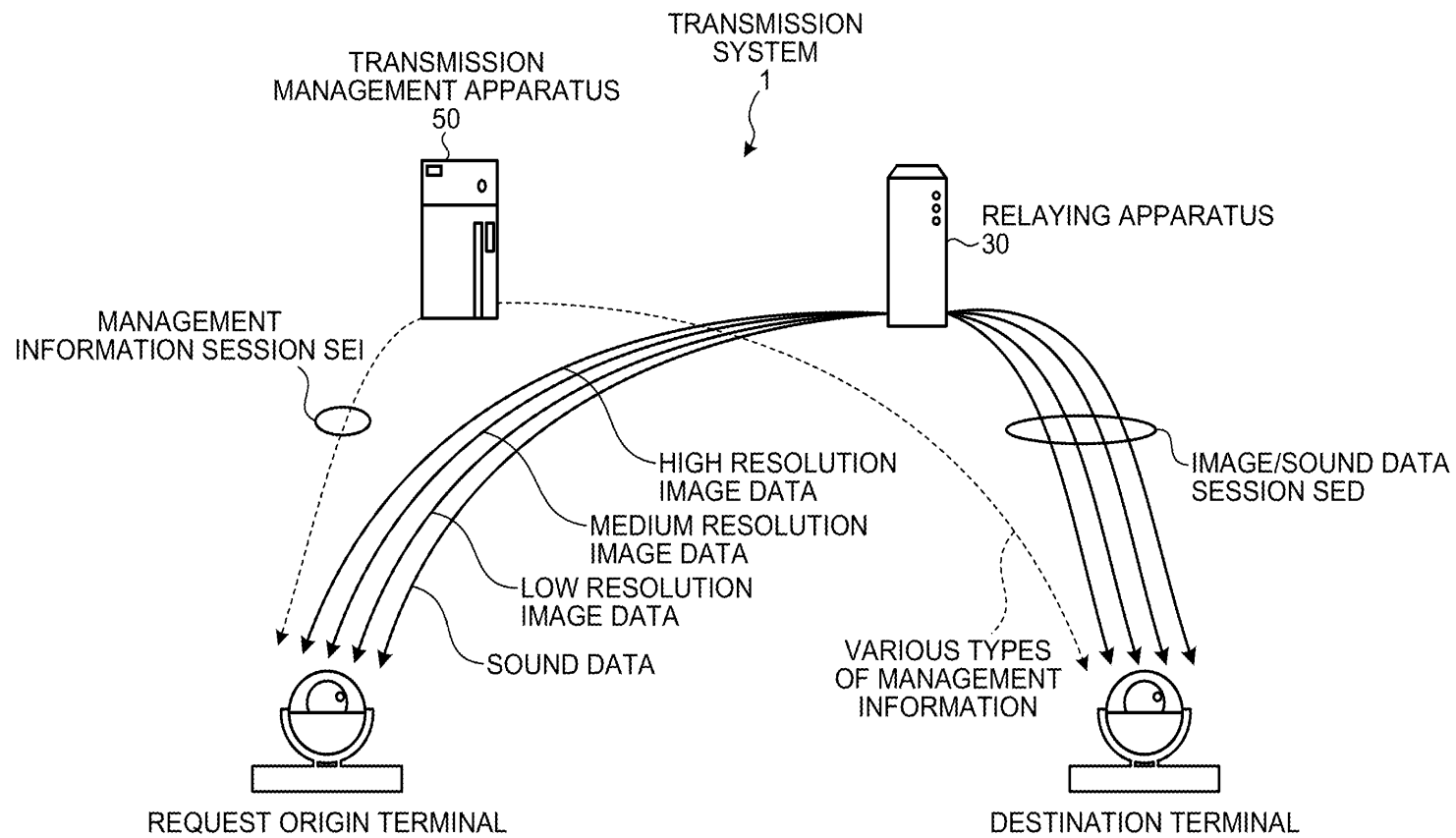


FIG.2

FIG.3

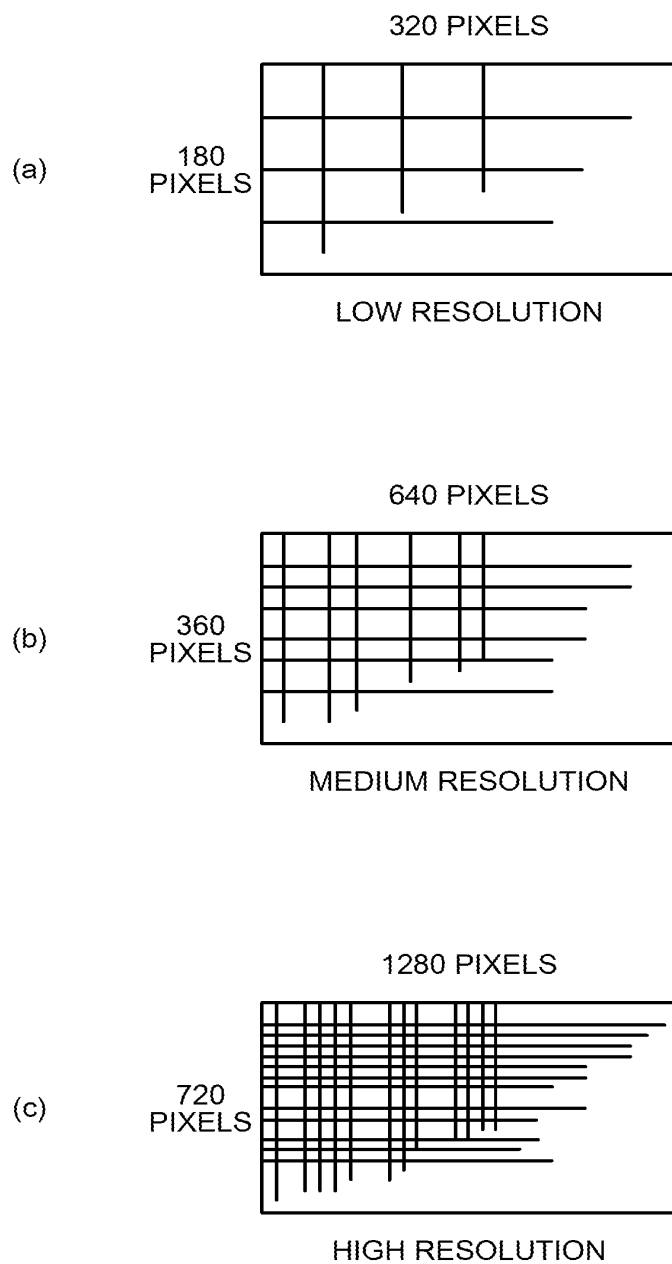
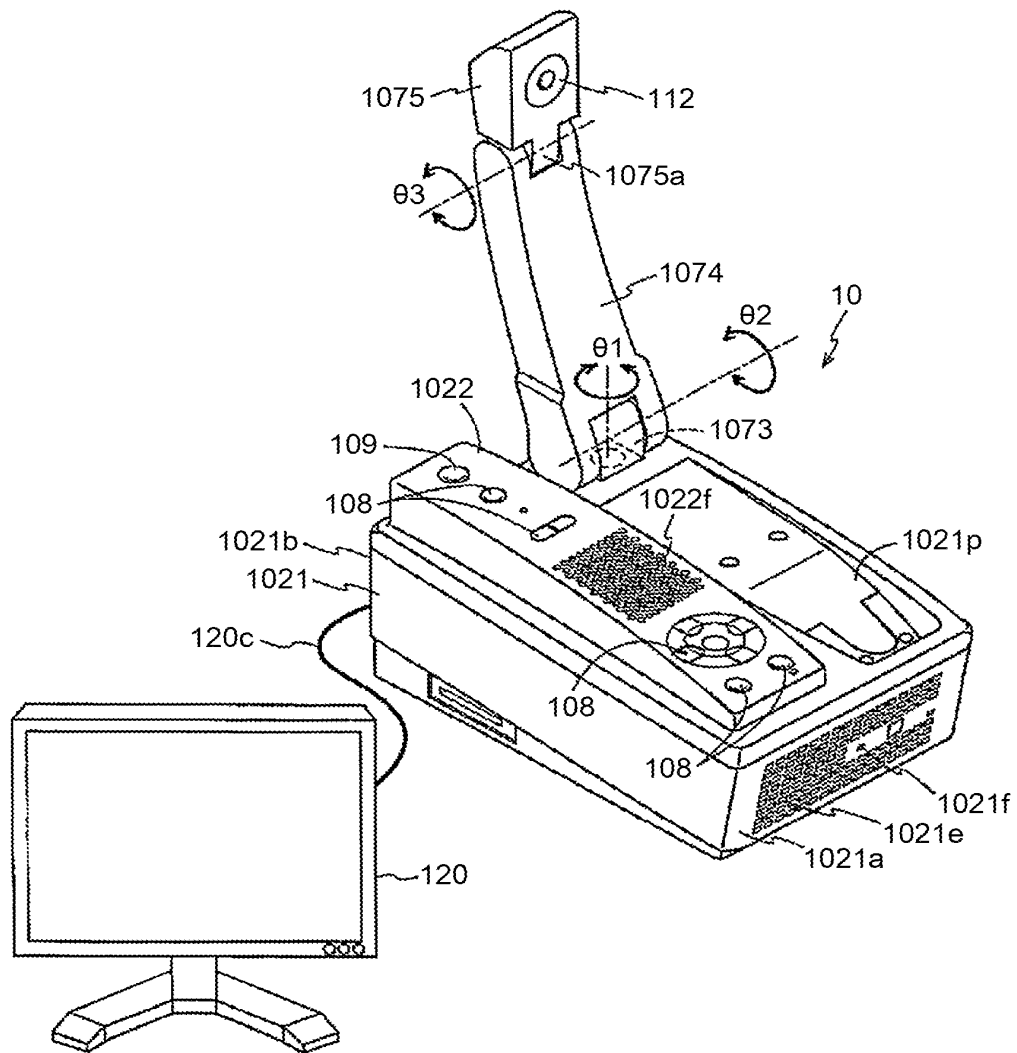


FIG.4



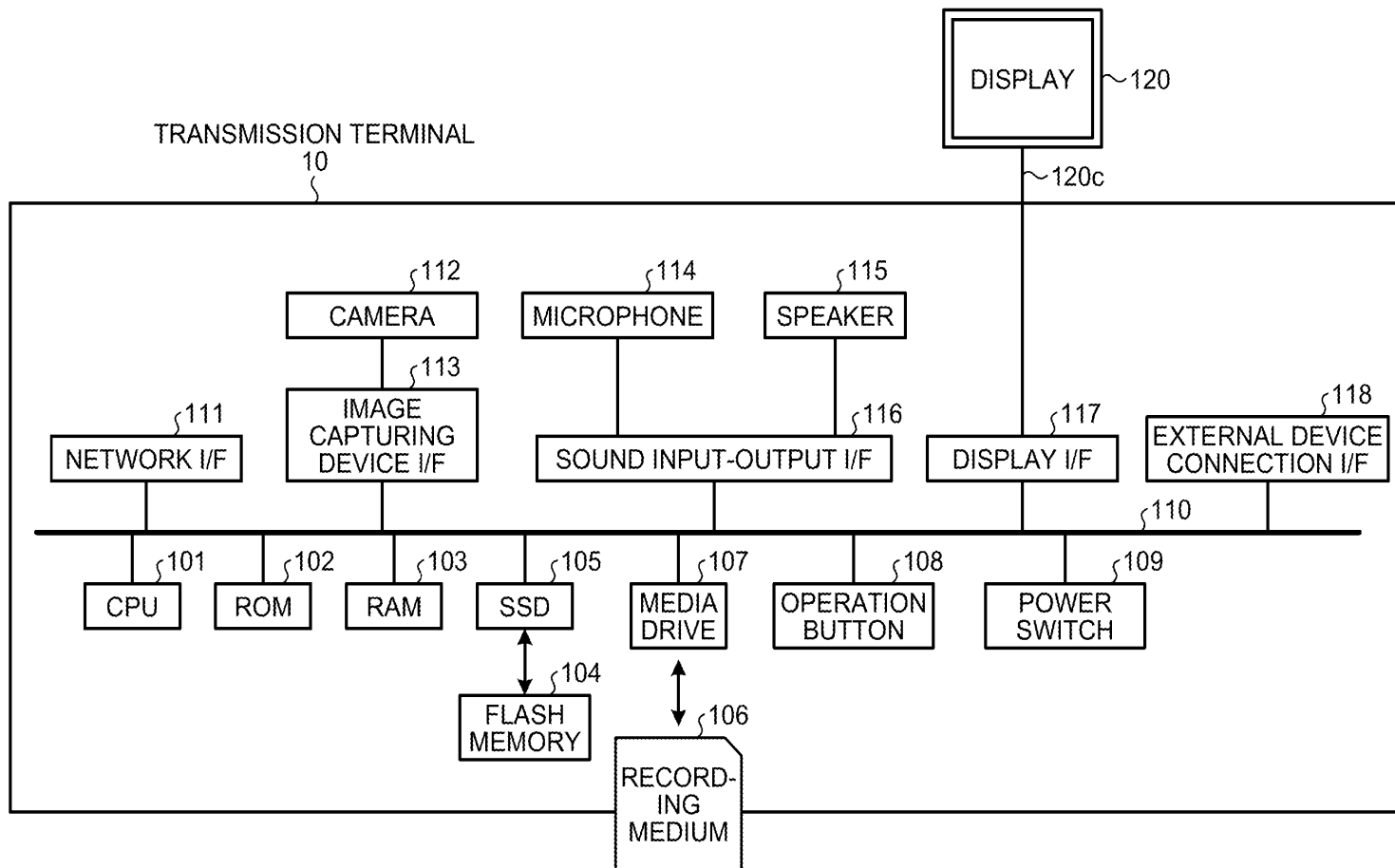


FIG.5

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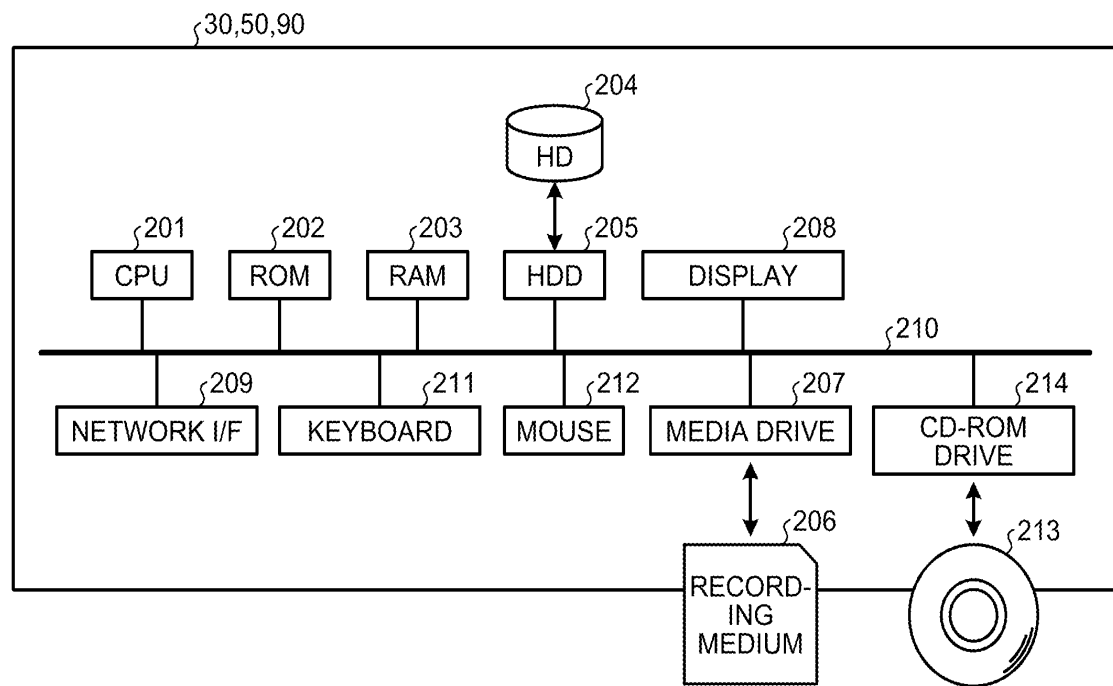
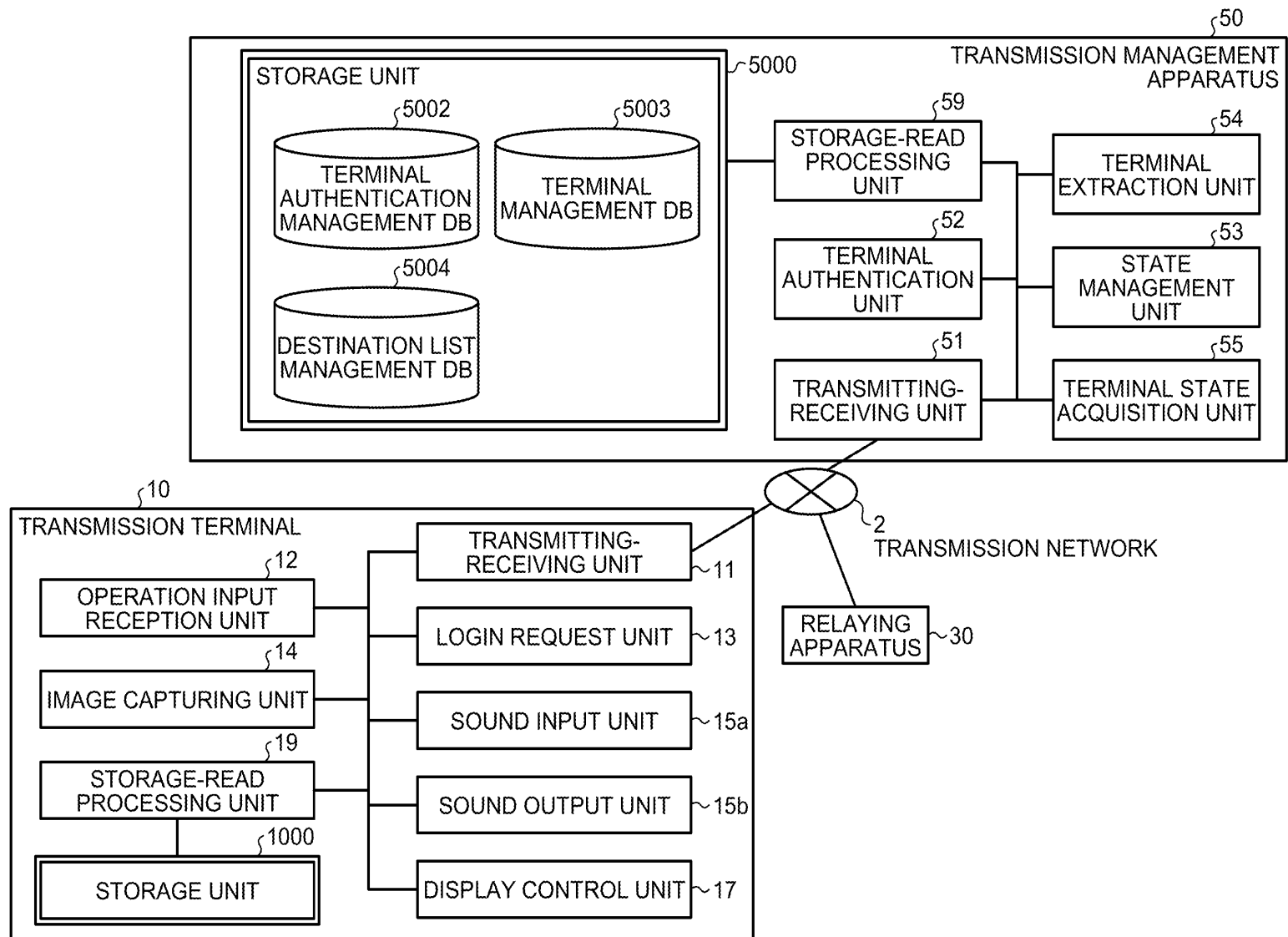


FIG. 6

FIG. 7



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FIG.8

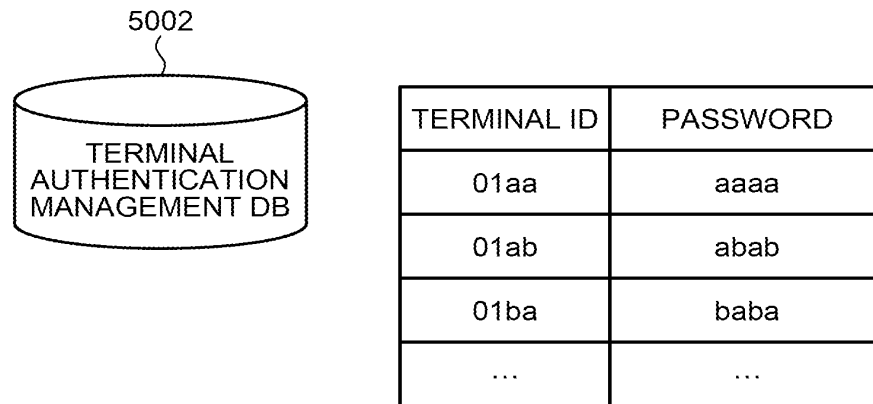


FIG.9

5003



TERMINAL ID	TERMINAL NAME	OPERATION STATE	RECEIVING DATE	IP ADDRESS OF TERMINAL
01aa	AA TERMINAL, TOKYO BUSINESS OFFICE, JAPAN	ONLINE (TRANSMISSION IS ENABLED)	2009.11.10. 13:40	1.2.1.3
01ab	AB TERMINAL, TOKYO BUSINESS OFFICE, JAPAN	OFFLINE	2009.11.09. 12:00	1.2.1.4
...	...	...	...	...
01ba	BA TERMINAL, OSAKA BUSINESS OFFICE, JAPAN	ONLINE (TRANSMISSION IS ENABLED)	2009.11.10. 13:45	1.2.2.3
01bb	BB TERMINAL, OSAKA BUSINESS OFFICE, JAPAN	ONLINE (TRANSMISSION IS ENABLED)	2009.11.10. 13:50	1.2.2.4
...	...	...	...	...
01ca	CA TERMINAL, NEW YORK BUSINESS OFFICE, USA	OFFLINE	2009.11.10. 12:45	1.3.1.3
01cb	CB TERMINAL, NEW YORK BUSINESS OFFICE, USA	ONLINE (IN TRANSMISSION)	2009.11.10. 13:55	1.3.1.4
...	...	...	...	...
01da	DA TERMINAL, WASHINGTON BUSINESS OFFICE, USA	OFFLINE	2009.11.08. 12:45	1.3.2.3
01db	DB TERMINAL, WASHINGTON BUSINESS OFFICE, USA	ONLINE (IN TRANSMISSION)	2009.11.10. 12:45	1.3.2.4
...	...	...	...	...

FIG.10

5004



REQUEST SOURCE TERMINAL ID	DESTINATION TERMINAL ID
01aa	01ab, 01ba, 01db
01ab	01aa, 01ca, 01cb
01ba	01aa, 01ab, 01ca, 01cb, 01da, 01db
...	...
01db	01aa, 01ab, 01ba, ..., 01da, 01ca, 01cb, ..., 01da

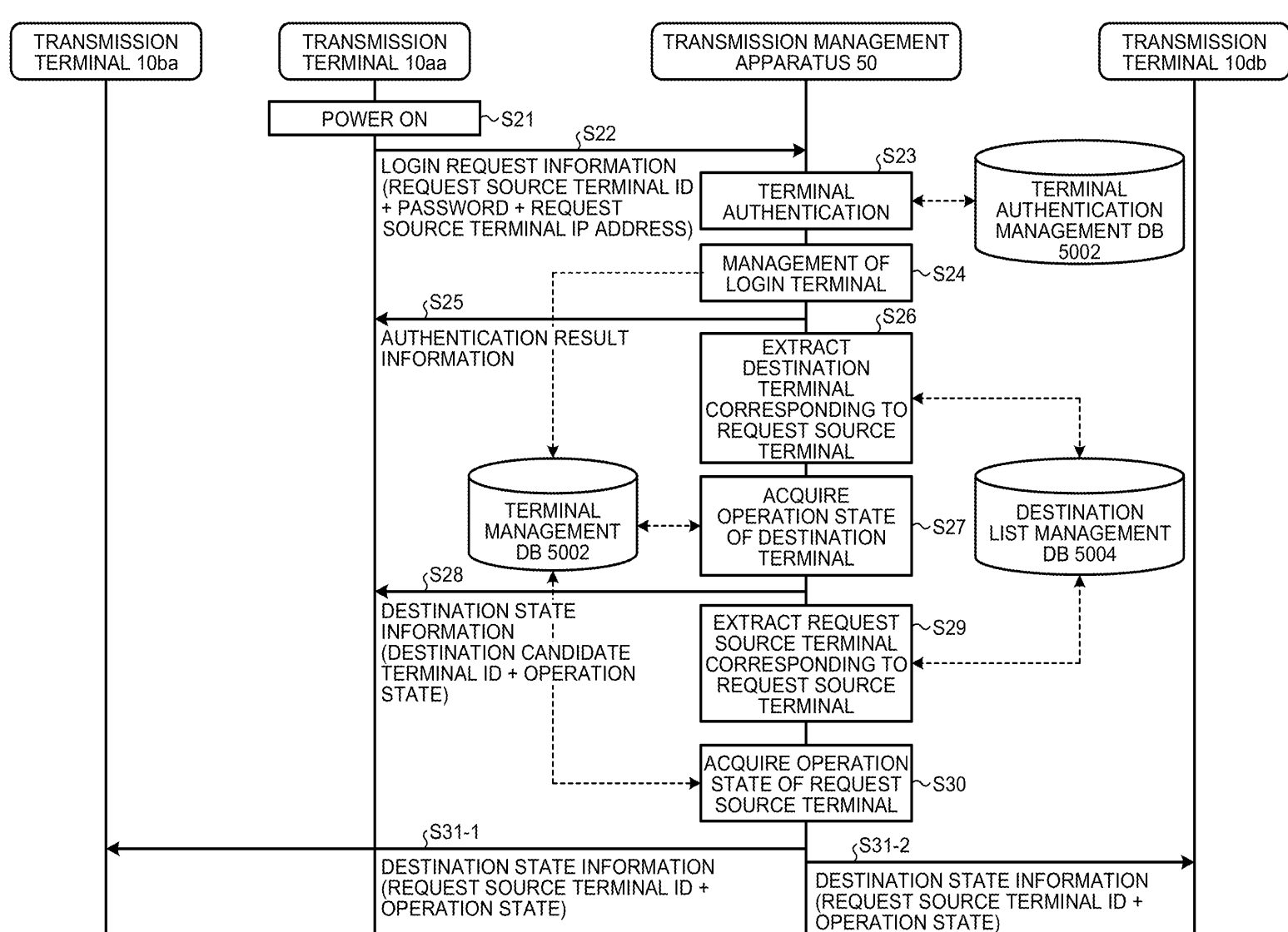


FIG.11

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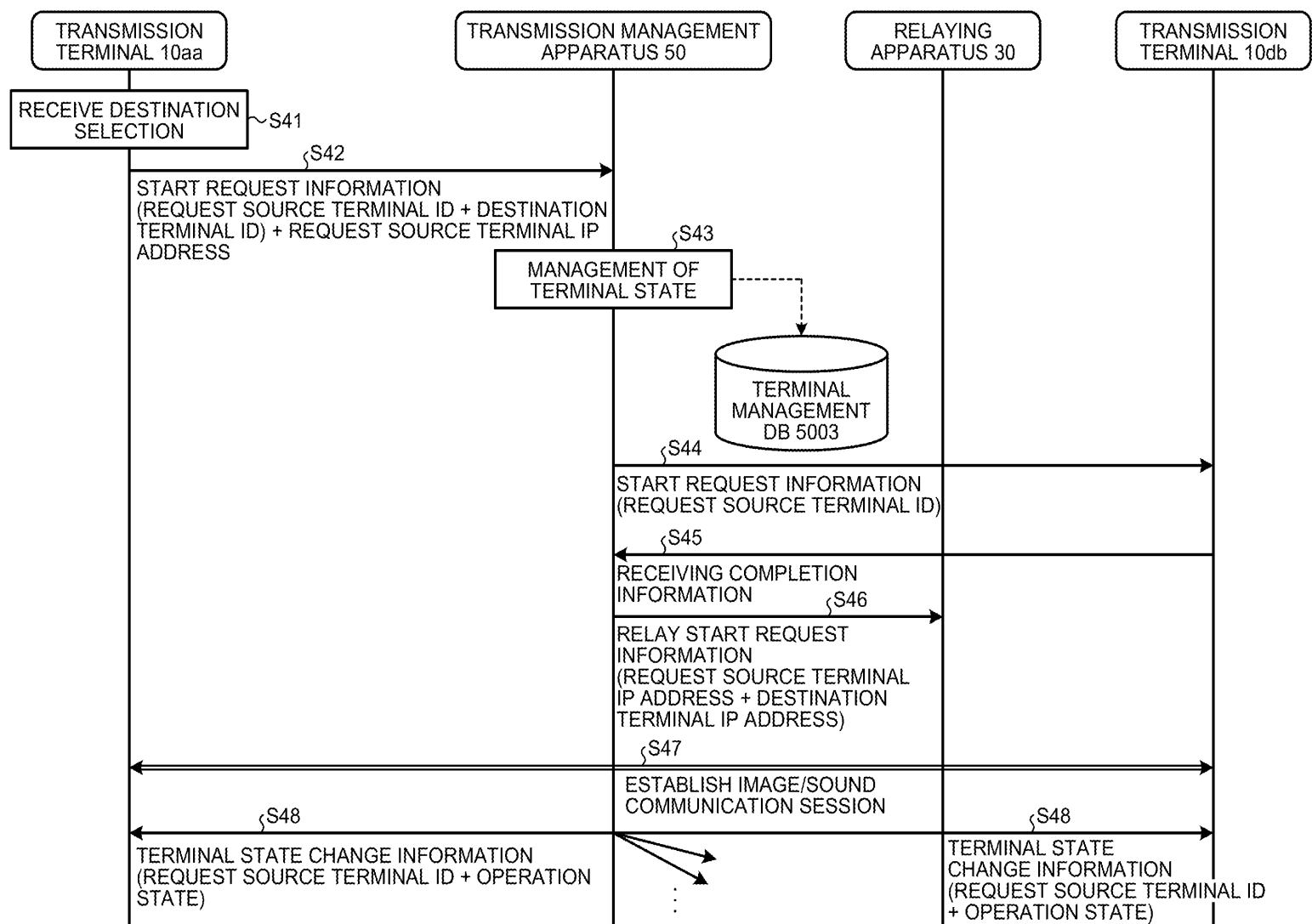


FIG.12

FIG.13

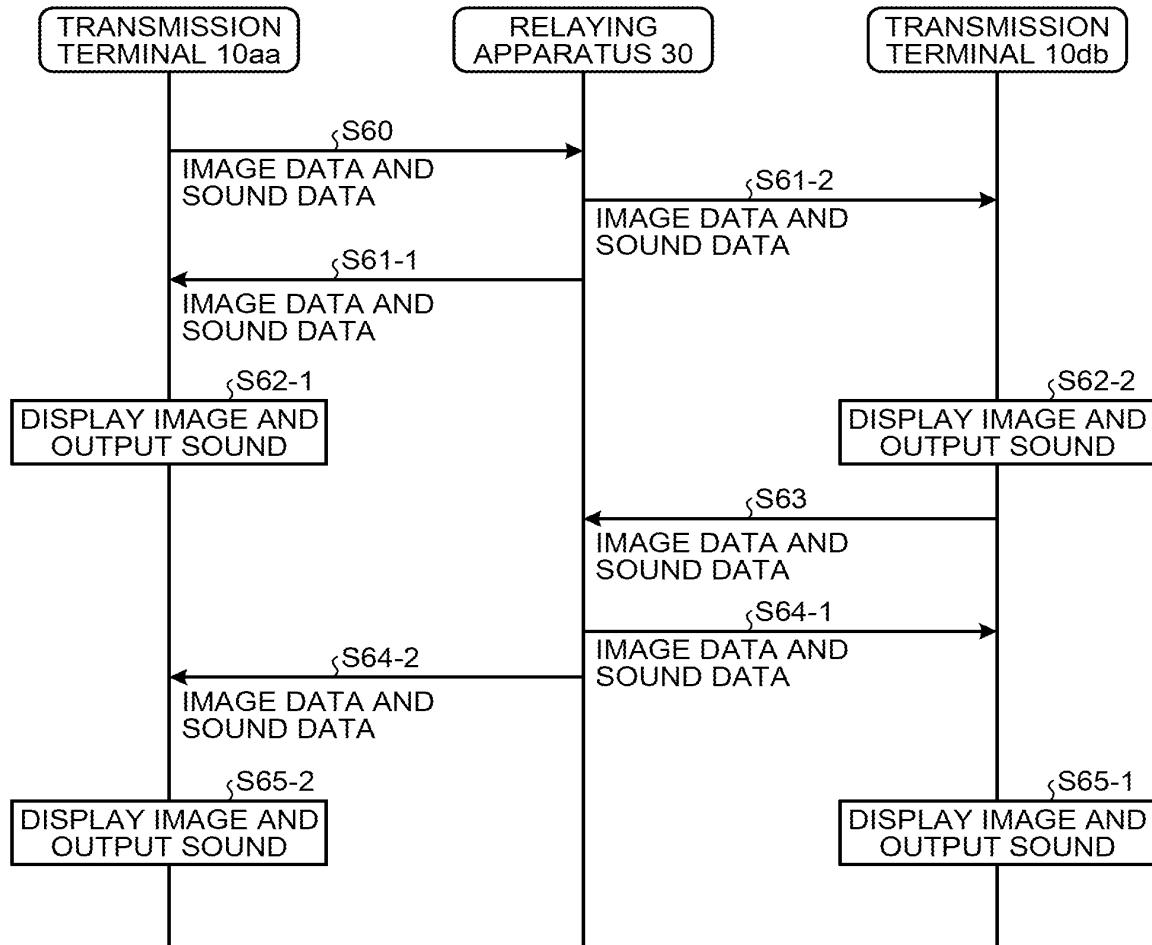


FIG.14

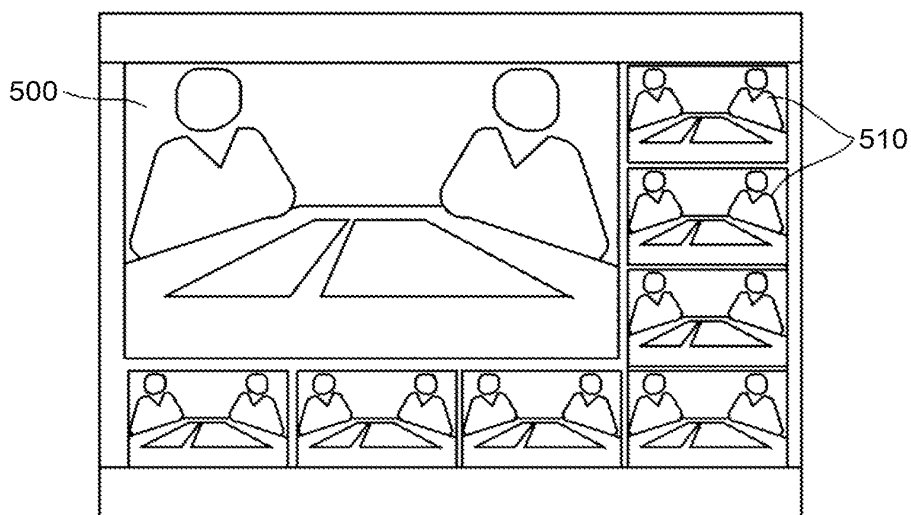
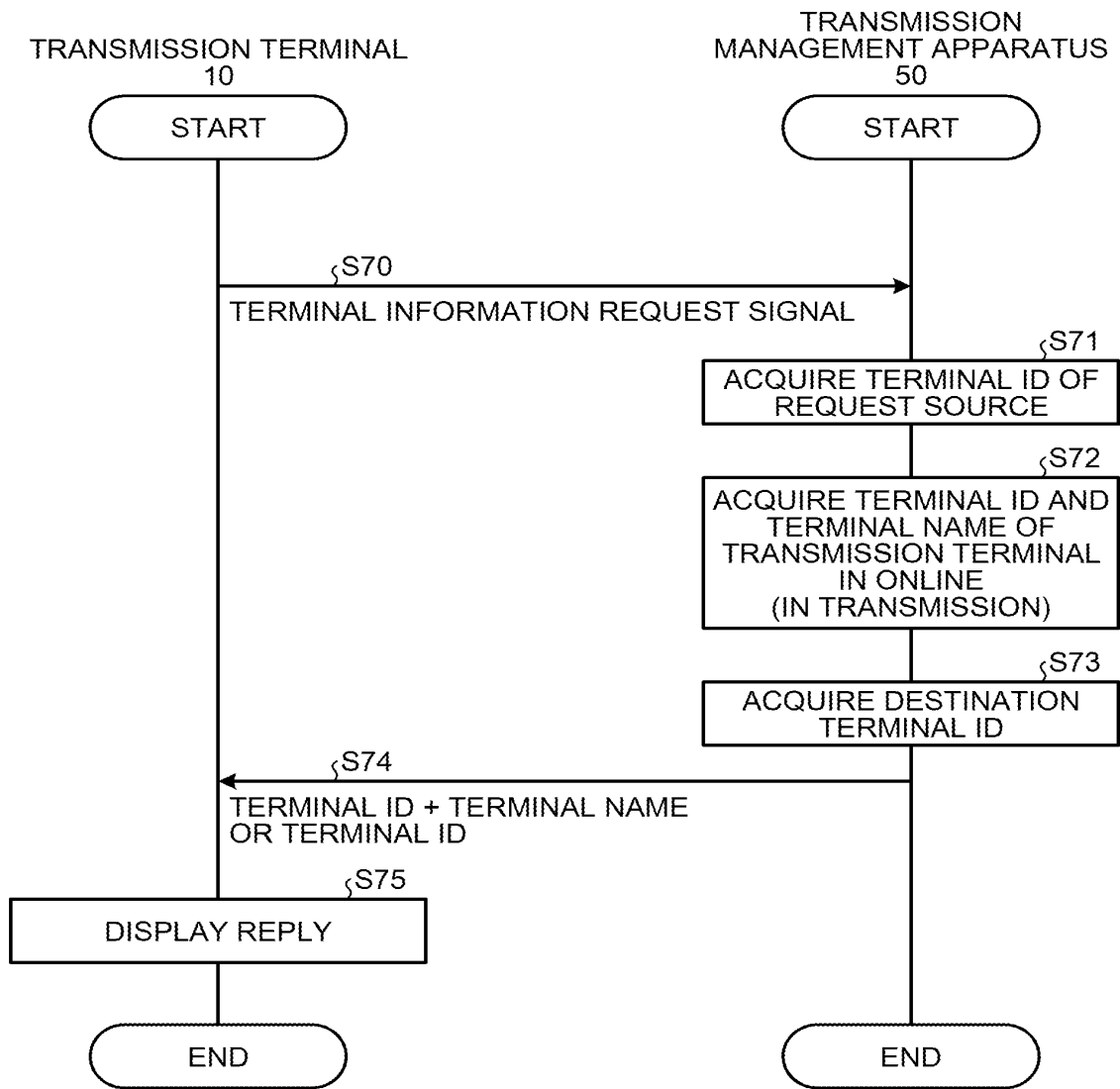


FIG.15

DETAILED CONFERENCE INFORMATION LIST OF SITES ATTENDING CONFERENCE		
	TERMINAL NAME	TERMINAL ID
520	01: AA TERMINAL, TOKYO BUSINESS OFFICE, JAPAN	01aa
	02	01cb
	03: DB TERMINAL, WASHINGTON BUSINESS OFFICE, USA	01db
		530

FIG.16



INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		16903713
	Filing Date		2020-06-17
	First Named Inventor	Yoshinaga KATO	
	Art Unit	2652	
	Examiner Name	EL-ZOOBI, MARIA	
	Attorney Docket Number	16408US04CON	

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	1							
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NON-PATENT LITERATURE DOCUMENTS								
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.						T ⁵

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		16903713
	Filing Date		2020-06-17
	First Named Inventor	Yoshinaga KATO	
	Art Unit	2652	
	Examiner Name	EL-ZOOBI, MARIA	
	Attorney Docket Number	16408US04CON	

1	Japanese Patent Application No. 2011-006934, filed January 17, 2011, RICOH COMPANY, LTD., with Verification of Translation, 85 pages.	☒
If you wish to add additional non-patent literature document citation information please click the Add button		
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Examiner Signature		Date Considered
*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.		
¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.		

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	16903713
	Filing Date	2020-06-17
	First Named Inventor	Yoshinaga KATO
	Art Unit	2652
	Examiner Name	EL-ZOOBI, MARIA
	Attorney Docket Number	16408US04CON

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Derek P. Benke/	Date (YYYY-MM-DD)	2022-08-05
Name/Print	Derek P. Benke	Registration Number	56,944

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The information provided by you in this form will be subject to the following routine uses:

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

VERIFICATION OF TRANSLATION

I, Kiyoharu ISOBE, of c/o SAKAI International Patent Office, 5F, Toranomom Mitsui Building 8-1, Kasumigaseki 3-chome, Chiyoda-ku, Tokyo 100-0013, hereby declare that I am a translator of the document attached, and attached document is a true and correct translation made by me to the best of my knowledge and belief.

Japanese Patent Application No.2011-042365, filed on February 28, 2011

Signature of Translator:



Kiyoharu ISOBE

Date : *October 17, 2018*

Electronic Acknowledgement Receipt	
EFS ID:	46353803
Application Number:	16903713
International Application Number:	
Confirmation Number:	1733
Title of Invention:	TRANSMISSION MANAGEMENT APPARATUS
First Named Inventor/Applicant Name:	Yoshinaga KATO
Customer Number:	154930
Filer:	Derek P. Benke/Chi Park
Filer Authorized By:	Derek P. Benke
Attorney Docket Number:	16408US04CON
Receipt Date:	05-AUG-2022
Filing Date:	17-JUN-2020
Time Stamp:	15:48:08
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$580
RAM confirmation Number	E202285F49061728
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		16408US04CONEOT1AMD_signed.pdf	5631821	yes	19
			615dd99d3a3912f01158d53fe56f0fb6dfeb324		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Transmittal Letter		1	1	
	Miscellaneous Incoming Letter		2	2	
	Extension of Time		3	4	
	Amendment/Request for Reconsideration-After Non-Final Rejection		5	5	
	Claims		6	15	
	Applicant Arguments/Remarks Made in an Amendment		16	19	
Warnings:					
Information:					
2		16408US04CONTRNPD.pdf	22928787	yes	79
			e599ee621c76252ed0ad55016950f7eb942c7c24		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Miscellaneous Incoming Letter		1	1	
	Translation of Foreign Priority Documents		2	79	
Warnings:					
Information:					

3	Information Disclosure Statement (IDS) Form (SB08)	16408US04CONIDS_signed.pdf	1135313	no	4
			e9628545f1f2c34a735d33f8ded1912a309a6585		
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
4	Foreign Reference	16408US04CONREF1.pdf	10997076	no	85
			1d41fc5b135ae69b79c2aef24c2e9fbc38a807c4		
Warnings:					
Information:					
5	Fee Worksheet (SB06)	fee-info.pdf	42996	no	2
			c23187c442220efbd5b305f2f2bc6b14c80ea		
Warnings:					
Information:					
Total Files Size (in bytes):			40735993		
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REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended, and in light of the following discussion, is respectfully requested.

Claims 1–24 are pending in this application, claims 1, 3, 7-11, 15, and 16 having been presently amended; and claims 17-24 having been added. Support for amended claims 1, 3, 7-11, 15, and 16, and new claims 17-24 can be found in the original claims, drawings, and specification as filed.¹ No new matter has been added.

Applicant acknowledges with appreciation the courtesy of Examiner El-Zoobi in granting an interview in this application with Applicant's representative on July 11, 2022, during which time the issues in the outstanding Office Action were discussed as substantially summarized hereinafter. The Examiner agreed that the proposed amendments that were discussed, which are substantially similar to those included herein, overcome the current rejections.

In the Office Action, claims 1-4 and 6-16 were rejected under 35 U.S.C. § 102(a) as anticipated by Volmat (U.S. Patent Publ. No. 2012/0185685). The present application claims priority to Japanese Patent Application No. 2011-042365, filed February 28, 2011. In accordance with 37 C.F.R. §1.55(a)(4), enclosed please find an English translation of the certified copy of this application, along with a statement that the translation is accurate. It is respectfully submitted that the enclosed document perfects the claim to priority to Japanese Patent Application No. 2011-042365 under 35 U.S.C. §119. Further, it is respectfully submitted that the subject matter of pending claims 1-17 are supported by the specification of this priority document. It is noted that the filing date of Japanese Patent Application No. 2011-042365 (February 28, 2011) antedates the filing date of January 6, 2012 of Volmat. It is also noted that

¹ See, e.g., paragraphs [0069] and [0148]-[0152] of the published application; Figs. 14 and 15; and claims 2-8.

the filing date of Japanese Patent Application No. 2011-042365 (February 28, 2011) antedates the November 18, 2011 filing date of JP 2011-253177 (one of two priority applications to Volmat). Thus, in Volmat, only subject matter supported in JP 2011-006934, filed on January 17, 2011, can be used in a rejection of the claims.

Further, Applicant respectfully requests that the next communication acknowledge that the certified copies of the priority documents have been received.

In regard to the rejections, Applicant submits that Volmat fails to teach “display an identification name list of sites including the first transmission terminal and the second transmission terminal which are attending the video communication during the video communication, wherein the first transmission terminal is configured to display video images from each transmission terminal attending the video communication simultaneously,” as recited in claim 1. Independent claims 9, 10, and 17, although varying in claim scope and/or statutory class, recite substantially similar features as claim 1. Thus, the arguments presented below with respect to claim 1 are also applicable to independent claims 9, 10, and 17.

Figure 7 of Volmat shows an example of displaying a destination list on a terminal device. However, in Figure 7 of Volmat, this destination list is not a screen to be displayed during participation of a video conference as described in Figure 6 of Volmat, but rather is a list to be displayed automatically after the terminal device is activated. In other words, the destination list in Figure 7 of Volmat is essentially to be displayed when the user's device is *not participating in the meeting*. Accordingly, even when a user views the destination list of Figure 7 of Volmat, the user cannot find which site is in the same meeting.

Figure 7 of Volmat shows a camera image 502 on the lower right corner. However, as described in paragraph [0099] of Volmat, this camera image 502 is not displayed during a

meeting. Instead, the user can use the image to adjust and prepare the position of the camera 112 before calling the destination terminal. In contrast, in claim 1, an identification name list of sites including the first transmission terminal and the second transmission terminal which are attending the video communication is displayed *during the video communication*.

In addition, Volmat describes the one camera image 502 before the meeting, but does not describe display “video images from each transmission terminal attending the video communication simultaneously,” as recited in claim 1.

Thus, Applicant respectfully submits that independent claims 1, 9, 10, and 17 (and all claims depending thereon) patentably distinguish over Volmat.

Accordingly, Applicant respectfully requests that the rejection of claims 1-4 and 6-16 under 35 U.S.C. § 102(a) as anticipated by Volmat be withdrawn.

Claim 5 was rejected under 35 U.S.C. § 103(a) as unpatentable over Volmat in view of Halavy. In response, Applicant notes that claim 5 is dependent on claim 1, and is believed to be patentable for at least the reasons discussed above. Further, Applicant respectfully submits that Halavy fails to cure the above-noted deficiencies of Volmat.

Accordingly, Applicant respectfully requests that the rejection of claim 5 under 35 U.S.C. § 103(a) as unpatentable over Volmat in view of Halavy be withdrawn.

Consequently, in view of the present amendment, and in light of the above discussion, the pending claims as presented herewith are believed to be in condition for formal allowance, and an early and favorable action to that effect is respectfully requested.

If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

The Commissioner is hereby authorized to charge any additional fees that may be required for papers being filed herewith and for which no payment is enclosed herewith, or credit any overpayment to Deposit Account 602325, with the EXCEPTION of deficiencies in fees for multiple dependent claims in new applications.

Respectfully Submitted,

XSENSUS, L.L.P.

/Derek Benke/

Derek P. Benke
Attorney of Record
Registration No. 56,944
Phone No. (571) 376-6306

Customer No. 154930
Xsensus LLP
100 Daingerfield Rd, Suite 402
Alexandria, VA 22314

TRANSMITTAL FORM <i>(to be used for all correspondence after initial filing)</i>	Application Number	16/903,713	
	Filing Date	17 Jun 2020	
	First Named Inventor	YOSHINAGA KATO	
	Art Unit	2652 Confirmation No. 1733	
	Examiner Name	EL-ZOOBI, MARIA	
Total Number of Pages in This Submission	187	Attorney Docket Number	16408US04CON

ENCLOSURES (Check all that apply)		
☒ Fee Transmittal Form ☒ Fee Attached ☒ Amendment/Reply ☐ After Final ☐ Affidavits/declaration(s) ☒ Extension of Time Request ☐ Express Abandonment Request ☒ Information Disclosure Statement ☐ Certified Copy of Priority Document(s) ☐ Reply to Missing Parts/ Incomplete Application ☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53	☐ Drawing(s) ☐ Licensing-related Papers ☐ Petition ☐ Petition to Convert to a Provisional Application ☐ Power of Attorney, Revocation Change of Correspondence Address ☐ Terminal Disclaimer ☐ Request for Refund ☐ CD, Number of CD(s) _____ ☐ Landscape Table on CD	☐ After Allowance Communication to TC ☐ Appeal Communication to Board of Appeals and Interferences ☐ Appeal Communication to TC (Appeal Notice, Brief, Reply Brief) ☐ Proprietary Information ☐ Status Letter ☒ Other Enclosure(s) (please identify below): Certified English Translation of Priority Document JP 2011-042365
Remarks The Commissioner is hereby authorized to charge any additional fees that may be required for papers being filed herewith and for which no payment is enclosed herewith, or credit any overpayment to Deposit Account 602325.		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT			
Firm Name	XSENSUS, LLP Customer Number 154930		
Signature	/Derek P. Benke/		
Printed name	Derek P. Benke		
Date	2022-8-5	Reg. No.	56,944

CERTIFICATE OF TRANSMISSION/MAILING			
I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:			
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IN THE UNITED STATES PATENT & TRADEMARK OFFICE
FEE TRANSMITTAL

Application Number	16/903,713
Filing Date	17 Jun 2020
First Named Inventor	YOSHINAGA KATO
Art Unit	2652
Examiner Name	EL-ZOOBI, MARIA
Attorney Docket Number	16408US04CON

☐ No additional fee is required

☐ Small entity status is claimed

	Claims Remaining After Amendment		Highest Number of Claims Previously Paid For	Current Extra Claims	Rate	Additional Fee
Total Claims	24	-	23	= 1	x \$ 100.00 =	\$ 100.00
Independent Claims	4	-	4	= 0	x \$ 480.00 =	\$
APPLICATION SIZE FEE (37 CFR 1.16(s))					\$	\$
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					N/A	\$
					TOTAL	\$ 100.00
EXTENSION OF TIME						\$ 220.00
REQUEST FOR RECONSIDERATION (RCE)						\$
NOTICE OF APPEAL						\$
TERMINAL DISCLAIMER						\$
INFORMATION DISCLOSURE STATEMENT						\$ 260.00
						\$
TOTAL						\$ 580.00
The Commissioner is hereby authorized to charge any additional fees that may be required for papers being filed herewith and for which no payment is enclosed herewith, or credit any overpayment to Deposit Account 602325						

XSENSUS, LLP
Customer Number:

154930

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 16/903,713		Filing Date 06/17/2020		☐ To be Mailed	
ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO									
APPLICATION AS FILED - PART I									
		(Column 1)			(Column 2)				
FOR		NUMBER FILED	NUMBER EXTRA		RATE (\$)		FEE (\$)		
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))		N/A	N/A		N/A				
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))		N/A	N/A		N/A				
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))		N/A	N/A		N/A				
TOTAL CLAIMS (37 CFR 1.16(i))		minus 20 =	*		x \$100 =				
INDEPENDENT CLAIMS (37 CFR 1.16(h))		minus 3 =	*		x \$460 =				
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))		If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).							
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))									
* If the difference in column 1 is less than zero, enter "0" in column 2.						TOTAL			
APPLICATION AS AMENDED - PART II									
		(Column 1)			(Column 2)	(Column 3)			
AMENDMENT	08/05/2022	CLAIMS REMAINING AFTER AMENDMENT			HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	* 24	Minus	** 23		= 1		x \$100 =	100
	Independent (37 CFR 1.16(h))	* 4	Minus	*** 4		= 0		x \$480 =	0
	☐ Application Size Fee (37 CFR 1.16(s))								
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))								
								TOTAL ADD'L FEE	100
		(Column 1)			(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT			HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	*	Minus	**		=		x \$0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***		=		x \$0 =	
	☐ Application Size Fee (37 CFR 1.16(s))								
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))								
								TOTAL ADD'L FEE	
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.								LIE	
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".								/VINCENT S BUTLER/	
*** 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.									

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Electronic Patent Application Fee Transmittal				
Application Number:		16903713		
Filing Date:		17-Jun-2020		
Title of Invention:		TRANSMISSION MANAGEMENT APPARATUS		
First Named Inventor/Applicant Name:		Yoshinaga KATO		
Filer:		Derek P. Benke/Chi Park		
Attorney Docket Number:		16408US04CON		
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
CLAIMS IN EXCESS OF 20	1202	1	100	100
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Extension - 1 month with \$0 paid	1251	1	220	220
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	1806	1	260	260
Total in USD (\$)				580

<i>Notice of References Cited</i>	Application/Control No. 16/903,713		Applicant(s)/Patent Under Reexamination KATO et al.	
	Examiner MARIA EL-ZOOBI		Art Unit 2652	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20100226546-A1	09-2010	Tanaka; Akifumi	H04N7/147	382/173
*	B	US-20070100944-A1	05-2007	Ford; Peter S.	H04L51/04	709/206
*	C	US-20120185685-A1	07-2012	VOLMAT; Alain	G06F21/572	713/2
	D					
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	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
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NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

U.S. Patent and Trademark Office
PTO-892 (Rev. 01-2001)

Notice of References Cited

Part of Paper No. 20220825

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		16903713
	Filing Date		2020-06-17
	First Named Inventor	Yoshinaga KATO	
	Art Unit	2652	
	Examiner Name	EL-ZOOBI, MARIA	
	Attorney Docket Number	16408US04CON	

U.S.PATENTS						
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear
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U.S.PATENT APPLICATION PUBLICATIONS						
Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear
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Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T ⁵
	1							☐

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NON-PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T ⁵

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /M.E/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		16903713
	Filing Date		2020-06-17
	First Named Inventor	Yoshinaga KATO	
	Art Unit	2652	
	Examiner Name	EL-ZOOBI, MARIA	
	Attorney Docket Number	16408US04CON	

1	Japanese Patent Application No. 2011-006934, filed January 17, 2011, RICOH COMPANY, LTD., with Verification of Translation, 85 pages.	☒
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If you wish to add additional non-patent literature document citation information please click the Add button

EXAMINER SIGNATURE

Examiner Signature	/MARIA EL-ZOOBI/	Date Considered	08/25/2022
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /M.E/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	16903713
	Filing Date	2020-06-17
	First Named Inventor	Yoshinaga KATO
	Art Unit	2652
	Examiner Name	EL-ZOOBI, MARIA
	Attorney Docket Number	16408US04CON

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Derek P. Benke/	Date (YYYY-MM-DD)	2022-08-05
Name/Print	Derek P. Benke	Registration Number	56,944

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /M.E/

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	16903713
	Filing Date	2020-06-17
	First Named Inventor	Yoshinaga KATO
	Art Unit	2652
	Examiner Name	EL-ZOOBI, MARIA
	Attorney Docket Number	16408US04CON

U.S.PATENTS								
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear		
	1							
If you wish to add additional U.S. Patent citation information please click the Add button.								
U.S.PATENT APPLICATION PUBLICATIONS								
Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear		
	1							
If you wish to add additional U.S. Published Application citation information please click the Add button.								
FOREIGN PATENT DOCUMENTS								
Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T ⁵
	1							☐
If you wish to add additional Foreign Patent Document citation information please click the Add button								
NON-PATENT LITERATURE DOCUMENTS								
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.						T ⁵

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	Filing Date		2020-06-17
	First Named Inventor	Yoshinaga KATO	
	Art Unit	2652	
	Examiner Name	EL-ZOOBI, MARIA	
	Attorney Docket Number	16408US04CON	

1	Blackboard Collaborate Essentials, Blackboard Collaborate 11, June 30, 2011, 22 pages.	☐
---	--	--------------------------

If you wish to add additional non-patent literature document citation information please click the Add button

EXAMINER SIGNATURE

Examiner Signature	/MARIA EL-ZOOBI/	Date Considered	08/25/2022
--------------------	------------------	-----------------	------------

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	Attorney Docket Number	16408US04CON

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Signature	/Derek P. Benke/	Date (YYYY-MM-DD)	2022-04-29
Name/Print	Derek P. Benke	Registration Number	56,944

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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Bibliographic Data

Application No: 16/903,713

Foreign Priority claimed: ☒ Yes ☐ No

35 USC 119 (a-d) conditions met: ☒ Yes ☐ No ☐ Met After Allowance

Verified and Acknowledged: /MARIA EL-ZOOBI/

Examiner's Signature

Initials

Title:

TRANSMISSION MANAGEMENT APPARATUS

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
06/17/2020	348	2652	16408US04CON
RULE			

APPLICANTS

RICOH COMPANY, LTD., Tokyo, JAPAN

INVENTORS

Yoshinaga KATO, Kanagawa, JAPAN

Taro OKUYAMA, Tokyo, JAPAN

CONTINUING DATA

This application is a CON of 15442787 02/27/2017 PAT 10735689

15442787 is a CON of 15041570 02/11/2016 PAT 9621848

15041570 is a DIV of 13989665 05/24/2013 PAT 9307197

13989665 is a 371 of PCT/JP12/55011 02/22/2012

FOREIGN APPLICATIONS

JAPAN JP2011-042365 02/28/2011

JAPAN JP2011-236251 10/27/2011

IF REQUIRED, FOREIGN LICENSE GRANTED**

06/25/2020

STATE OR COUNTRY

JAPAN

ADDRESS

XSENSUS LLP
100 Daingerfield Road
Suite 402
Alexandria, VA 22314
UNITED STATES

FILING FEE RECEIVED

\$1,720

<i>Index of Claims</i> 	Application/Control No. 16/903,713	Applicant(s)/Patent Under Reexamination KATO et al.
	Examiner MARIA EL-ZOOBI	Art Unit 2652

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS										
☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47										
CLAIM		DATE								
Final	Original	04/15/2021	08/11/2021	11/30/2021	03/10/2022	03/30/2022	08/25/2022			
	1	✓	÷	✓	✓	✓	=			
	2		÷	✓	✓	✓	=			
	3		÷	✓	✓	✓	=			
	4		÷	✓	✓	✓	=			
	5		÷	✓	✓	✓	=			
	6		÷	✓	✓	✓	=			
	7		÷	✓	✓	✓	=			
	8		÷	✓	✓	✓	=			
	9		÷	✓	✓	✓	=			
	10		÷	✓	✓	✓	=			
	11		÷	-	✓	✓	=			
	12		÷	-	✓	✓	=			
	13		÷	-	✓	✓	=			
	14		÷	-	✓	✓	=			
	15		÷	-	✓	✓	=			
	16		÷	-	✓	✓	=			
	17		÷	-	-		=			
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	19		÷	-	-		=			
	20		÷	-	-		=			
	21		÷	-	-		=			
	22		÷	-	-		=			
	23		÷	-	-		=			
	24						=			

Issue Classification 	Application/Control No. 16/903,713	Applicant(s)/Patent Under Reexamination KATO et al.
	Examiner MARIA EL-ZOABI	Art Unit 2652

CPC						
Symbol					Type	Version
H04N	/	7	/	147	F	2013-01-01
H04N	/	7	/	152	I	2013-01-01
H04N	/	7	/	15	I	2013-01-01
H04M	/	3	/	563	I	2013-01-01
H04M	/	3	/	567	I	2013-01-01
H04L	/	65	/	1059	I	2013-01-01

CPC Combination Sets				
Symbol	Type	Set	Ranking	Version
/				

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	24	
/MARIA EL-ZOABI/ Primary Examiner, Art Unit 2652	25 August 2022	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office

Part of Paper No.: 20220825

Issue Classification 	Application/Control No. 16/903,713	Applicant(s)/Patent Under Reexamination KATO et al.
	Examiner MARIA EL-ZOABI	Art Unit 2652

INTERNATIONAL CLASSIFICATION			
CLAIMED			
H04N7/14		7	14
H04N7/15		7	15
H04M3/56		3	56
H04L65/1059		65	1059
NON-CLAIMED			

US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS
348	14.02

CROSS REFERENCES(S)					
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	24	
/MARIA EL-ZOABI/ Primary Examiner, Art Unit 2652	25 August 2022	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office

Part of Paper No.: 20220825

Issue Classification 	Application/Control No. 16/903,713	Applicant(s)/Patent Under Reexamination KATO et al.
	Examiner MARIA EL-ZOOBI	Art Unit 2652

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47															
CLAIMS															
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	10	10	19	19										
2	2	11	11	20	20										
3	3	12	12	21	21										
4	4	13	13	22	22										
5	5	14	14	23	23										
6	6	15	15	24	24										
7	7	16	16												
8	8	17	17												
9	9	18	18												

NONE (Assistant Examiner) _____ (Date) _____		Total Claims Allowed: 24	
/MARIA EL-ZOOBI/ Primary Examiner, Art Unit 2652 (Primary Examiner) _____ (Date) 25 August 2022		O.G. Print Claim(s) 1	O.G. Print Figure 1



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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

154930 7590 08/31/2022
XSENSUS LLP
100 Daingerfield Road
Suite 402
Alexandria, VA 22314

EXAMINER

EL-ZOOBI, MARIA

ART UNIT

PAPER NUMBER

2652

DATE MAILED: 08/31/2022

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/903,713	06/17/2020	Yoshinaga KATO	16408US04CON	1733

TITLE OF INVENTION: TRANSMISSION MANAGEMENT APPARATUS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1200	\$0.00	\$0.00	\$1200	11/30/2022

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) 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. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including 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: Use Block 1 for any change of address)

154930 7590 08/31/2022
XSENSUS LLP
100 Daingerfield Road
Suite 402
Alexandria, VA 22314

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) 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 or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/903,713	06/17/2020	Yoshinaga KATO	16408US04CON	1733

TITLE OF INVENTION: TRANSMISSION MANAGEMENT APPARATUS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1200	\$0.00	\$0.00	\$1200	11/30/2022

EXAMINER	ART UNIT	CLASS-SUBCLASS
EL-ZOOBI, MARIA	2652	348-014020

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/AIA/122 or PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) The names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
- (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. 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. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☐ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies _____

4b. Method of Payment: (Please first reapply any previously paid fee shown above)

- ☐ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)
- ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. Change in Entity Status (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
- ☐ Applicant asserting small entity status. See 37 CFR 1.27
- ☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____



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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/903,713	06/17/2020	Yoshinaga KATO	16408US04CON	1733
154930	7590	08/31/2022	EXAMINER	
XSENSUS LLP			EL-ZOOBI, MARIA	
100 Daingerfield Road			ART UNIT	
Suite 402			PAPER NUMBER	
Alexandria, VA 22314			2652	

DATE MAILED: 08/31/2022

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. 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.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 16/903,713	Applicant(s) KATO et al.	
	Examiner MARIA EL-ZOOBI	Art Unit 2652	AIA (FITF) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 8/5/2022.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are 1-24. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov**.

4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
Certified copies:
a) ☒ All b) ☐ Some* c) ☐ None of the:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)	5. ☐ Examiner's Amendment/Comment
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.	6. ☒ Examiner's Statement of Reasons for Allowance
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.	7. ☐ Other _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____.	

/MARIA EL-ZOOBI/ Primary Examiner, Art Unit 2652	8/25/2022
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Notice of Pre-AIA or AIA Status

The present application is being examined under the pre-AIA first to invent provisions.

Allowable Subject Matter

Claims 1-24 are allowed.

The following is an examiner's statement of reasons for allowance: none of the cited arts alone or in reasonable combination teaches { update, when the second transmission terminal attends the video communication, the second attendance state associated with the second transmission terminal to a state indicating that the second transmission terminal is attending the video communication; acquire information including an identification name associated with a transmission terminal with which an attendance state is associated and in which the attendance state indicates that the transmission terminal is attending the video communication, from the storage medium; and transmit the acquired information to the first transmission terminal, wherein the acquired information is used in order to display an

Art Unit: 2652

identification name list of sites including the first transmission terminal and the second transmission terminal which are attending the video communication during the video communication, wherein the first transmission terminal is configured to display video images from each transmission terminal attending the video communication simultaneously}.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARIA EL-ZOOBI whose telephone number is (571)270-3434. The examiner can normally be reached Monday-Friday 7-4.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Ahmad Matar** can be reached on **5712727488**. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users.

To file and manage patent submissions in Patent Center, visit:

<https://patentcenter.uspto.gov>. Visit

<https://www.uspto.gov/patents/apply/patent-center> for more

information about Patent Center and

<https://www.uspto.gov/patents/docx> for information about filing in

Application/Control Number: 16/903,713

Page 5

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DOCX format. For additional questions, contact the Electronic Business

Center (EBC) at 866-217-9197 (toll-free). If you would like assistance

from a USPTO Customer Service Representative, call 800-786-9199 (IN

USA OR CANADA) or 571-272-1000.

/MARIA EL-ZOOBI/

Primary Examiner, Art Unit 2652

<i>Search Notes</i> 	Application/Control No. 16/903,713	Applicant(s)/Patent Under Reexamination KATO et al.
	Examiner MARIA EL-ZOOBI	Art Unit 2652

CPC - Searched*		
Symbol	Date	Examiner
H04L65/1509, H04M3/563, H04M3/567, H04N7/15, H04N7/152	03/30/2022	M.EL

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner
348	14.02, 14.08, 14.09	04/15/2021	M.EL

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
inventor and assignee search	03/16/2021	M.EL
us and CPC search	03/16/2021	M.EL
text search	03/16/2021	M.EL
ip.com search	11/30/2021	M.EL
search is updated	11/30/2021	M.EL
search is updated	03/10/2022	M.EL
search is updated	03/30/2022	M.EL

/MARIA EL-ZOOBI/ Primary Examiner, Art Unit 2652	8/25/2022
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<i>Search Notes</i> 	Application/Control No. 16/903,713	Applicant(s)/Patent Under Reexamination KATO et al.
	Examiner MARIA EL-ZOOBI	Art Unit 2652

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
709	204	08/25/2022	

/MARIA EL-ZOOBI/ Primary Examiner, Art Unit 2652	8/25/2022
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PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	1	16/903713	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	OFF	OFF	2021/03/15 08:29 AM
L2	22202	((("RICOH") near3 ("COMPANY") near3 ("LTD"))).AS,AANM.	(USPAT)	OR	OFF	OFF	2021/03/15 08:29 AM
L3	143	((("KATO") near3 ("Yoshinaga"))).INV.	(US-PGPUB)	OR	OFF	OFF	2021/03/15 08:29 AM
L4	33	((("OKUYAMA") near3 ("Taro"))).INV.	(US-PGPUB)	OR	OFF	OFF	2021/03/15 08:29 AM
L5	7	15/442787 13/989665 15/041570	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	OFF	OFF	2021/03/15 08:34 AM
L6	22372	L2 L3 L4 L5	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/03/15 08:35 AM
L7	679	L6 and (management near1 table)".clm" and (terminal near1 state).clm. and identifier.clm.	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/03/15 08:36 AM
L8	679	L6 and (management near1 table)".clm" and (terminal near1 state).clm. and identifier.clm. and request.clm. and name.clm.	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/03/15 08:37 AM
L9	679	L6 and (management near1 table)".clm" and (terminal adj state).clm. and identifier.clm. and request.clm. and name.clm.	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/03/15 08:38 AM
L10	679	L6 and (management near1 table)".clm." and (terminal adj state).clm. and identifier.clm. and request.clm. and name.clm.	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/03/15 08:38 AM
L11	679	L7 and (management near1 table)".clm." and (terminal adj state).clm. and identifier.clm. and request.clm. and name.clm.	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/03/15 08:39 AM
L12	7	L5 and (management near1 table)".clm." and	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/03/15 08:39 AM

		(terminal adj state).clm. and identifier.clm. and request.clm. and name.clm.					
L13	3	L5 and ((management near1 table)and (terminal adj state) and identifier and request and name).clm.	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/03/15 08:39 AM
L14	2	"20120185685"	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/03/15 08:51 AM
L15	1	"9,307197".pn.	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/03/15 08:53 AM
L16	2	"20120185685"	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/03/15 10:51 AM
L17	11054	348/14.01-14.08.ccls.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	OFF	OFF	2021/03/16 06:58 AM
L18	11621	(H04L65/1509 H04M3/563 H04M3/567 H04N7/15 H04N7/152).cpc.	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/03/16 07:00 AM
L19	11316	L18 AND ((H04N7/15 OR H04N7/147 OR H04N7/152 OR H04N7/142 OR H04N7/157 OR H04N2007/145 OR H04L65/403 OR H04L12/1822 OR H04L12/1818 OR H04M3/567).CPC.)	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/03/16 07:04 AM
L20	4	15/442787 "10,735689".pn.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	OFF	OFF	2021/11/30 08:15 AM
L21	2	"10,735689".pn.	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	OFF	OFF	2021/11/30 09:07 AM
L22	6001	((terminal devcie) near2 (ID identification identity name))and state and conferenc\$3	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2021/11/30 10:23 AM
L23	12158	(H04L65/1509 H04M3/563 H04M3/567 H04N7/15 H04N7/152).cpc.	(US-PGPUB; USPAT)	OR	OFF	OFF	2021/11/30 10:24 AM
L24	636	L22 and L23	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2021/11/30 10:24 AM
L25	2273	((terminal devcie) near2	(US-PGPUB; USPAT;	OR	ON	ON	2021/11/30

L26	377	(ID identification identity name))and (state with (updat\$3 modif\$4 manag\$3 chang\$3)) and conferenc\$3	USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)				10:25 AM
L27	1612	L25 and L23	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2021/11/30 10:25 AM
L28	323	((terminal devcie) near2 (ID identification identity name))and (state near3 (updat\$3 modif\$4 manag\$3 chang\$3)) and conferenc\$3	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2021/11/30 10:26 AM
L29	31301	L27 and L23	(US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2021/11/30 10:26 AM
L30	38	2 3 4	(US-PGPUB; USPAT)	OR	ON	ON	2022/03/30 05:29 AM
L31	5	29 AND attend\$4.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2022/03/30 05:30 AM
L32	3	AND state.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2022/03/30 05:32 AM
L33	1	"9,307197".pn.	(US-PGPUB; USPAT)	OR	ON	ON	2022/03/30 05:45 AM
L34	1	"9,621848".pn.	(US-PGPUB; USPAT)	OR	ON	ON	2022/03/30 05:45 AM
L35	3	"10,735689".pn.	(US-PGPUB; USPAT)	OR	ON	ON	2022/03/30 05:46 AM
L36	1	L34 L33 L32	(US-PGPUB; USPAT)	OR	ON	ON	2022/03/30 05:47 AM
L37	1	35 AND attend\$4.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2022/03/30 05:47 AM
L38	5	AND state.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2022/03/30 05:47 AM
L39	0	"20120185685"	(US-PGPUB; USPAT)	OR	ON	ON	2022/03/30 05:50 AM
L40	711	"20070100944"	(US-PGPUB; USPAT)	OR	ON	ON	2022/03/30 06:02 AM
L41	469	"20100226546"	(US-PGPUB; USPAT)	OR	ON	ON	2022/03/30 11:39 AM
L42	4	35 AND attend\$4.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2022/03/30 11:40 AM
		AND updat\$3.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2022/03/30
		(video near1 conferenc\$3) SAME (multiple multi plurality) WITH MCU	(US-PGPUB; USPAT)	OR	ON	ON	2022/03/30
		(video near1 conferenc\$3) WITH (multiple multi plurality) WITH MCU	(US-PGPUB; USPAT)	OR	ON	ON	2022/03/30
		(video near1	(US-PGPUB; USPAT)	OR	ON	ON	2022/03/30

		conferenc\$3) WITH (multiple multi plurality) WITH MCU WITH relay\$3 WITH (data image audio)					11:40 AM
L43	11818	709/204.ccls.	(US-PGPUB; USPAT)	OR	ON	ON	2022/08/25 10:32 AM
L44	47	709/204.ccls. AND 25	(US-PGPUB; USPAT)	OR	ON	ON	2022/08/25 10:32 AM
L45	37	709/204.ccls. AND 27	(US-PGPUB; USPAT)	OR	ON	ON	2022/08/25 10:32 AM
L46	11	709/204.ccls. AND 28	(US-PGPUB; USPAT)	OR	ON	ON	2022/08/25 10:32 AM

PE2E SEARCH - Search History (Interference)

There are no Interference searches to show.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including 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: Use Block 1 for any change of address)

154930 7590 08/31/2022
XSensus LLP
100 Daingerfield Road
Suite 402
Alexandria, VA 22314

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) 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 or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/903,713	06/17/2020	Yoshinaga KATO	16408US04CON	1733

TITLE OF INVENTION: TRANSMISSION MANAGEMENT APPARATUS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1200	\$0.00	\$0.00	\$1200	11/30/2022

EXAMINER	ART UNIT	CLASS-SUBCLASS
EL-ZOOBI, MARIA	2652	348-014020

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/AIA/122 or PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

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. XSensus LLP

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. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

RICOH COMPANY, LTD.

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

TOKYO, JAPAN

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government4a. Fees submitted: ☒ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies _____

4b. Method of Payment: (Please first reapply any previously paid fee shown above)

☒ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. 602325

5. Change in Entity Status (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
- ☐ Applicant asserting small entity status. See 37 CFR 1.27
- ☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____/Derek P. Benke/

Date _____ November 29, 2022

Typed or printed name _____Derek P. Benke

Registration No. _____56,944

Electronic Acknowledgement Receipt	
EFS ID:	47107467
Application Number:	16903713
International Application Number:	
Confirmation Number:	1733
Title of Invention:	TRANSMISSION MANAGEMENT APPARATUS
First Named Inventor/Applicant Name:	Yoshinaga KATO
Customer Number:	154930
Filer:	Derek P. Benke/Chi Park
Filer Authorized By:	Derek P. Benke
Attorney Docket Number:	16408US04CON
Receipt Date:	29-NOV-2022
Filing Date:	17-JUN-2020
Time Stamp:	15:32:18
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$1200
RAM confirmation Number	E2022ASF32441686
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	16408US04CONIF_signed.pdf	273445	no	1
			3fef34505381a61c3476ca88ccd9ad2008a74eca		
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	37922	no	2
			dec91513007df6ca16a6263b4dfda80effa59b8f		
Warnings:					
Information:					
Total Files Size (in bytes):			311367		
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					

Electronic Patent Application Fee Transmittal				
Application Number:		16903713		
Filing Date:		17-Jun-2020		
Title of Invention:		TRANSMISSION MANAGEMENT APPARATUS		
First Named Inventor/Applicant Name:		Yoshinaga KATO		
Filer:		Derek P. Benke/Chi Park		
Attorney Docket Number:		16408US04CON		
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	1501	1	1200	1200

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1200



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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/903,713	01/03/2023	11546548	16408US04CON	1733

154930 7590 12/14/2022
XSSENSUS LLP
100 Daingerfield Road
Suite 402
Alexandria, VA 22314

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Patents Stakeholder Experience (OPSE), Stakeholder Support Division (SSD) at (571)-272-4200.

INVENTOR(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional inventors):

Yoshinaga KATO, Kanagawa, JAPAN;
Taro OKUYAMA, Tokyo, JAPAN;

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

RICOH COMPANY, LTD., Tokyo, JAPAN;

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IR103 (Rev. 10/09)