DESCRIPTION

TRANSMISSION MANAGEMENT APPARATUS,TRANSMISSION TERMINAL, TRANSMISSION SYSTEM, TRANSMISSION MANAGEMENT METHOD, TRANSMISSION TERMINAL CONTROL METHOD, TRANSMISSION MANAGEMENT PROGRAM, AND TRANMISSION TERMINAL CONTROL PROGRAM

TECHNICAL FIELD

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

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.

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.

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

CLAIMS

1. A transmission management apparatus for managing transmission states of a plurality of transmission terminals including a first transmission terminal and a second transmission terminal, 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 from the first transmission terminal, the terminal information request signal indicating a request for information for identifying the second transmission terminal, the first transmission terminal and the second transmission terminal being in transmission therebetween;

a terminal state acquisition unit configured to acquire the information for identifying the second 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 first transmission terminal.

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, if the identifier of the second transmission terminal is registered in the destination list for the first transmission terminal, the identifier and the identification name of the second transmission terminal and the identifier of the transmission terminal that is not registered in the destination list of the first transmission terminal from the terminal management table in response to the terminal information request signal.

3. A transmission terminal comprising:

a transmitting unit configured to transmit a terminal information request signal to a transmission management apparatus for managing transmission states of a plurality of transmission terminals through a network, the terminal information request signal indicating a request for information for identifying at least one of the transmission terminals, the transmission terminal and the at least one of the transmission terminals being in transmission therebetween;

a receiving unit configured to receive the 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.

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 at least one of the transmission terminals 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.

5. The transmission terminal according to claim 3, 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 the at least one of the transmission terminals and transmitted, in addition to the information received by the receiving unit.

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 the at least one of the transmission terminals.

7. The transmission terminal according to claim 4,

further comprising an image data input unit to which image data representing an image taken by an imaging device is input, wherein

in the information display mode, 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 the at least one of the transmission terminals and transmitted, in addition to the information received by the receiving unit, and identifies one of the transmission terminals as the major transmission terminal when the operation input reception unit receives selection of a piece of information of the one of the transmission terminals from the information displayed on the display unit.

8. A transmission system, comprising:

a plurality of transmission terminals including a first transmission terminal and a second transmission terminal; 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 from the first transmission terminal, the terminal information request signal indicating a request for information for identifying the second transmission terminal, the first transmission

terminal and the second transmission terminal being in transmission therebetween,

a terminal state acquisition unit configured to acquire the information for identifying the second 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 first transmission terminal, and

each of the transmission terminal serves as the first transmission terminal or the second transmission terminal, and includes

a transmitting unit configured to transmit a terminal information request signal indicating a request for information for identifying at least one of the transmission terminals to the transmission management apparatus, the transmission terminal and the at least one of the transmission terminals being in transmission therebetween,

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.

9. A transmission management method for managing transmission states of a plurality of transmission terminals including a first transmission terminal and a second transmission terminal using a transmission management apparatus, the transmission management method comprising:

receiving a terminal information request signal from the first transmission terminal, the terminal information request signal indicating a request for information for identifying the second transmission terminal, the first transmission terminal and the second transmission terminal being in transmission therebetween;

acquiring the information for identifying the second transmission terminal from a terminal management table in which terminal information including an identifier and an identification name of each of the transmission terminals is managed, in response to the terminal information request signal, the terminal management table being stored in a recording medium; and

transmitting the acquired information to the first transmission terminal.

10. A transmission terminal control method using a transmission terminal, comprising:

transmitting a terminal information request signal to a transmission management apparatus for managing transmission states of a plurality of transmission terminals through a network, the terminal information request signal indicating a request for information for identifying at least one of the transmission terminals, the transmission terminal and the at least one of the transmission terminals being in transmission therebetween;

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

causing a display unit to display the received information.

11. A computer program product comprising a non-transitory

computer readable medium including programmed instructions, wherein the instructions, when executed by a computer included in a transmission management apparatus for managing transmission states of a plurality of transmission terminals including a first transmission terminal and a second transmission terminal using a transmission management apparatus, cause the computer to execute:

receiving a terminal information request signal from the first transmission terminal, the terminal information request signal indicating a request for information for identifying the second transmission terminal, the first transmission terminal and the second transmission terminal being in transmission therebetween;

acquiring the information for identifying the second transmission terminal from a terminal management table in which terminal information including an identifier and an identification name of each of the transmission terminals is managed, in response to the terminal information request signal, the terminal management table being stored in a recording medium; and

transmitting the acquired information to the first transmission terminal.

12. A computer program product comprising a non-transitory computer readable medium including programmed instructions, wherein the instructions, when executed by a computer included in a transmission terminal, cause the computer to execute:

transmitting a terminal information request signal to a transmission management apparatus for managing transmission states of a plurality of transmission terminals through a network, the terminal information request signal indicating a request for information for

identifying at least one of the transmission terminals, the transmission terminal and the at least one of the transmission terminals being in transmission therebetween,

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

causing a display unit to display the received information.

CLAIMS

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

a state management unit configured to manage the transmission states for respective pieces of information for indentifying the transmission terminals;

a receiving unit configured to receive a terminal information request signal indicating a request for information for identifying a transmission terminal being in transmission with another transmission terminal;

a terminal state acquisition unit configured to acquire the information for identifying the transmission terminal being in transmission with the another transmission terminal that is a transmision source of the terminal information request signal, based on the transmission states managed by the state management unit, 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 another transmission terminal that is the transmision source of the terminal information request signal.

2. The transmission management apparatus according to claim 1, wherein each of the pieces of information for indentifying the transmission terminals managed by the state management unit includes an identifier and an identification name of the corresponding transmission terminal.

3. The transmission management apparatus according to claim 2, 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, among from the transmission terminals being in transmission with the another transmission terminal that is the transmision source of the terminal information request signal, from the state management unit, the identifier and the identification name of a transmission terminal that is registered in the destination list for the transmission terminal that is the transmision source of the terminal information request signal, and the identifier of a transmission terminal that is not registered in the destination list, in response to the terminal information request signal.

4. The transmission management apparatus according to any one of claims 1 to 3, wherein the information to be transmitted by the transmitting unit includes the identifier of the transmission terminal.

5. The transmission management apparatus according to any one of claims 1 to 3, wherein the information to be transmitted by the transmitting unit includes the identification name of the transmission terminal.

6. A transmission terminal for being in 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, to the transmission management apparatus, a terminal information request signal indicating a request for information for identifying the at least one transmission terminal being in transmission with the transmission terminal;

a receiving unit configured to receive the 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.

7. The transmission terminal according to claim 6, 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 all the transmission terminals being in transmission 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 when switching the all-image display mode to the information display mode.

8. The transmission terminal according to claim 6 or 7, 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 being in transmission and transmitted, in addition to the information received by the receiving unit.

9 The transmission terminal according to claim 8, 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, as the major transmission terminal among all the transmission terminals being in transmission.

10. The transmission terminal according to claim 7, further comprising an image data input unit to which image data representing an image taken by an imaging device is input, wherein

in the information display mode, 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 being in transmission and transmitted, in addition to the information received by the receiving unit, and identifies one of the transmission terminals as the major transmission terminal when the operation input reception unit receives selection of a piece of information of the one of the transmission

terminals from the information displayed on the display unit.

11. The transmission terminal according to any one of claims 6 to 10, wherein the information to be transmitted by the transmission management apparatus includes the identifier of the transmission terminal.

12. The transmission terminal according to any one of claims 6 to 10, wherein the information to be transmitted by the transmission management apparatus includes the identification name of the transmission terminal.

13. 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 state management unit configured to manage the transmission states for respective pieces of information for indentifying the transmission terminals;

a receiving unit configured to receive a terminal information request signal indicating a request for information for identifying a transmission terminal being in transmission with another transmission terminal;

a terminal state acquisition unit configured to acquire the information for identifying the transmission terminal being in transmission with the another transmission terminal that is a transmision source of the terminal information request signal, based on the transmission states managed by the state management unit, 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 another transmission terminal that is the transmision source of the terminal information request signal, and

each of the transmission terminals includes

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

a receiving unit configured to receive the 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.

14. A transmission management method using a transmission management apparatus for managing transmission states of a plurality of transmission terminals, the transmission management method, comprising the steps of:

managing the transmission states for respective pieces of information for indentifying the transmission terminals;

receiving a terminal information request signal indicating a request for information for identifying a transmission terminal being in transmission with another transmission terminal;

acquiring the information for identifying the transmission terminal being in transmission with the another transmission terminal that is a transmision source of the terminal information request signal, based on the

transmission states managed at the step of managing, in response to the terminal information request signal; and

transmitting the information acquired at the step of acquiring to the another transmission terminal that is the transmision source of the terminal information request signal.

15. A transmission terminal control method using a transmission terminal for being in 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 control method, comprising the steps of:

transmitting, to the transmission management apparatus, a terminal information request signal indicating a request for information for identifying the at least one transmission terminal being in transmission with the transmission terminal;

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

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

16. A transmission management program causing a computer serving as a transmission management apparatus for managing transmission states of a plurality of transmission terminals, to execute the steps of:

managing the transmission states for respective pieces of information for indentifying the transmission terminals;

receiving a terminal information request signal indicating a request for information for identifying a

transmission terminal being in transmission with another transmission terminal;

acquiring the information for identifying the transmission terminal being in transmission with the another transmission terminal that is a transmision source of the terminal information request signal, based on the transmission states managed at the step of managing, in response to the terminal information request signal; and

transmitting the information acquired at the step of acquiring to the another transmission terminal that is the transmision source of the terminal information request signal.

17. A transmission terminal control program causing a computer serving as a transmission terminal for being in 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, to execute the steps of:

transmitting, to the transmission management apparatus, a terminal information request signal indicating a request for information for identifying the at least one transmission terminal being in transmission with the transmission terminal;

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

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