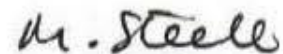


DECLARATION OF MARY STEELE

I, Mary Steele, pursuant to 28 U.S.C. § 1746, hereby declare as follows:

1. I am a Translator at TransPerfect, Inc.
2. I submit this declaration to certify the accuracy of the English translation of JP2005191786A.
3. My statements are based on personal knowledge and my review of JP2005191786A and its Japanese to English translation. If called as a witness about the facts contained in these statements, I could testify competently based on such personal knowledge and the investigation I have conducted.
4. Attached as Exhibit A is a true and accurate copy of JP2005191786A.
5. Attached as Exhibit B is a true and accurate copy of an English translation of JP2005191786A ("the JP2005191786A Translation").
6. The JP2005191786A Translation is a true and accurate translation of JP2005191786A from Japanese to English.
7. All statements made herein of my own knowledge are true, and all statements made on information and belief are believed to be true. Further, I am aware that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001. I declare under penalty of perjury that the foregoing is true and correct.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct. Executed on July 20, 2023, at New York, New York.



Mary Steele

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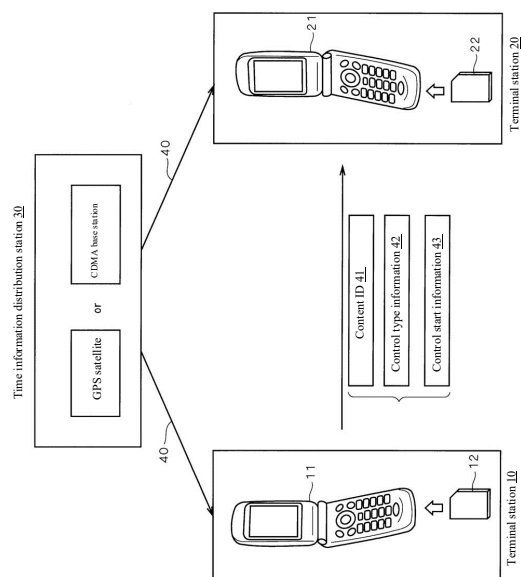
(54) [Title of invention] Method for synchronization
control between terminals

(57) [ABSTRACT]

[Problem to be solved] To allow a plurality of
terminals to synchronously reproduce content data.

[Means for solving the problems] A terminal station
10 and a terminal station 20 acquire the time
information 40 distributed by the time information
distribution station 30. Then, when the terminal
station 10 sends a content ID 41, control type
information 42, and control start information 43 to
the terminal station 20, the terminal station 10 and
terminal station 20 start control of the content data
specified with the content ID 41 at the time specified
with the control start information 43 according to
reference time information distributed from a
common time information distributing station 30.

[Selection drawing] FIG. 1



[Scope of Claims]

[Claim 1]

A method for synchronously controlling content data between a first terminal and a second terminal,
wherein the control start information designating a control start time for content data is transmitted from the first terminal to the second terminal;

a step in which the first terminal and the second terminal start controlling the content data at the time specified by the control start information based on reference time information distributed from a common time information distribution station; and

A synchronization control method between terminals, characterized by comprising:

[Claim 2]

A method for synchronously controlling content data between a first terminal and a second terminal,

A method for performing synchronization control of content data between a first terminal and a second terminal;

A step of replying from the second terminal to the first terminal as a preparation time a time required from receiving a content data control start instruction to starting control of the content data;

A step of transmitting the control start instruction from the first terminal to the second terminal;

The second terminal, after receiving the control start indication, initiates control of the content data after the preparation time has elapsed, wherein the first terminal determines a delay time based on a time from sending the query command to receiving the response, and initiates control of the content data after a time from the time of sending the control start indication plus the delay time and the preparation time has elapsed; and

A synchronization control method between terminals, characterized by comprising:

[Claim 3]

A method for synchronously controlling content data between a first terminal and a second terminal,

A step of transmitting a measurement command from the first terminal to the second terminal;

A step of transmitting a reply to the measurement command from the second terminal to the first terminal;

A step of transmitting start time information designating a content data control start time from the first terminal to the second terminal;

wherein the second terminal begins to control the content data at a time specified in the start time information based on a time code continuously transmitted from the first terminal to the second terminal, the first terminal calculates a delay time based on a time from sending the measurement command to receiving the response, and based on the time code, begins to control the content data after the delay time has elapsed from a time specified in the start time information; and

A synchronization control method between terminals, characterized by comprising:

[Claim 4]

The method of synchronization control between terminals according to any of claims 1 to 3, further comprising:

A step of transmitting a content ID specifying content data to be controlled from the first terminal to the second terminal;

A synchronization control method between terminals, characterized by comprising:

[Claim 5]

The method of synchronization control between terminals according to any of claims 1 to 4, further comprising:

Transmitting control type information for designating control content for content data from the first terminal to the second terminal.

A synchronization control method between terminals, characterized by comprising:

[Claim 6]

In the synchronous control method between the terminals according to any one of claims 1 to 5,

a synchronization control method between terminals,

wherein the content data includes moving image data and/or audio data.

[Claim 7]

A synchronization control method between terminals characterized by comprising: In the synchronous control method between the terminals according to any one of claims 1 to 6,
the first terminal and/or the second terminal are mobile phone terminals.

[Claim 8]

A synchronization control method between terminals characterized by comprising: in the synchronous control method between the terminals according to any one of claims 1 to 7,
synchronous control between terminals, wherein the content data is stored in a memory card, and the first terminal and/or the second terminal access the content data by inserting the memory card.

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[Detailed description of invention]

[Technical field]

[0001]

The present invention relates to a technology for synchronizing and reproducing content data such as video and audio between a plurality of terminals.

[Background Technology]

[0002]

Various technologies have appeared that use wireless networks to distribute and play back time data such as video and audio.

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[0003]

In order to realize such a technique, first, it is necessary to absolutely increase the communication bandwidth necessary for distributing video and audio. In addition, from the standpoint of QOS (Quality of Service), even in the event of a physical environment deterioration or jam in network transmission, it is necessary to ensure a minimum communication bandwidth so that video and audio can be delivered as smoothly as possible.

[0004]

However, these technologies are focused on playing video and audio as much as possible in the same way as at the time of transmission, and are very focused on synchronizing the absolute time of transmission and playback between the sending terminal and the receiving terminal.

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[0005]

[Patent Literature 1] JP 2003-60652 A

[Disclosure of invention]

[Problem to be solved by the invention]

[0006]

However, as multimedia data playback devices become more and more personalized in the future, it is expected that mobile devices that have been used only for remote communication in the past will be used to enrich these communications even when people actually interact with each other.

[0007]

In such a situation, it is required that video, audio, etc. are reproduced in complete synchronization with each individual terminal. This is because if video and audio played from each terminal are not synchronized in time in communication with people, audio and visual delays in video and audio make it difficult to smoothly obtain information played from those data.

[0008]

In addition, the technology disclosed in Patent Literature 1 above is a method of transmitting and receiving video data itself between terminals, which requires a wide communication band and a high processing capacity for the terminal.

[0009]

The purpose of the present invention is to synchronize the data reproduced in each terminal in such meeting-to-communication, so that a plurality of users can enjoy multi-play games and video teaching materials more effectively and jointly.

[Means for solving the problem]

[0010]

In order to solve the above problem, the invention described in Claim 1 is characterized in that a method for synchronously controlling content data between a first terminal and a second terminal, wherein control start information designating a control start time for content data is transmitted from the first terminal to the second terminal, and the first terminal and the second terminal based on reference time information distributed from a common time information distribution station, and a step of starting control of the content data at a time designated by the control start information.

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[0011]

The invention according to claim 2 is characterized in that a method for synchronizing content data between a first terminal and a second terminal is provided; the method comprising the step of: transmitting an inquiry command from the first terminal to the second terminal; a step of replying from the second terminal to the first terminal a time required from receiving a content data control start instruction to starting control of the content data as a preparation time; a step of transmitting the control start instruction from the first terminal to the second terminal; and after the second terminal receives the control start instruction, the second terminal starts controlling the content data after the preparation time elapses and obtaining a delay time based on the time from when the first terminal transmits the inquiry command to when it receives the reply; and a step of starting control of the content data after a time obtained by adding the delay time and the preparation time from the time when the control start instruction is transmitted.

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[0012]

The invention described in Claim 3 is characterized in that a method of synchronization control of content data between a first terminal and a second terminal, the method comprising the steps of: sending a measurement command from the first terminal to the second terminal; sending a response to the measurement command from the second terminal to the first terminal; sending a start time information from the first terminal to the second terminal that specifies a control start time for the content data; starting control of the content data at a time specified in the start time information based on a time code continuously transmitted from the first terminal to the second terminal; calculating a delay time based on a time from sending the measurement command to receiving the response; and starting control of the content data after the delay time specified in the start time information based on the time code.

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[0013]

The invention according to claim 4 is characterized in that it comprises a step of transmitting a content ID specified for the content data to be controlled from the first terminal to the second terminal in a synchronization control method between the terminals according to any of claims 1 to 3.

[0014]

The invention according to claim 5 is characterized in that it comprises a step of transmitting control type information specifying control content for content data from the first terminal to the second terminal in a synchronization control method between the terminals according to any of claims 1 to 4.

[0015]

The invention according to claim 6 is characterized in that, in a synchronization control method between the terminals according to any one of claims 1 to 5, the content data includes moving image data and/or audio data.

[0016]

The invention according to claim 7 is characterized in that in the synchronization control method between the terminals according to any of claims 1 to 6, the first terminal and/or the second terminal comprise a cellular phone

terminal.

[0017]

The invention according to claim 8 is characterized in that, in the synchronization control method between the terminals according to any of claims 1 to 7, the content data is stored in a memory card, and the first terminal and/or the second terminal access the content data by inserting the memory card.

[Effects of the present invention]

[0018]

According to the present invention, it is possible to synchronize playback of the same content data stored at each terminal station. Moreover, unlike the case of performing synchronous reproduction by wirelessly transmitting moving images between a plurality of terminals, a large amount of transmission capacity and power consumption are not required.

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[Detailed Description of the Preferred Embodiments]

[0019]

{First embodiment}

A first embodiment of the present invention will be described with reference to FIG. 1. The synchronization control system according to the first embodiment includes two terminal stations 10 and 20 and a time information distribution station 30.

[0020]

In the present embodiment, the terminal stations 10 and 20 are constituted by mobile phones 11 and 21. The terminal stations 10 and 20 have memory card slots. The memory cards 21 and 22 are inserted into the terminal stations 10 and 20, respectively, so that various content data stored in the memory cards 21 and 22 can be accessed. Each of the terminal stations 10 and 20 has a short-range wireless communication function, and can exchange data with each other by wireless communication. For example, infrared wireless communication or BlueTooth is used as the wireless communication. Therefore, although the terminal stations 10 and 20 are configured by mobile phones, in the following description, the terminal stations 10 and 20 all perform short-range wireless communication such as infrared wireless communication and BlueTooth and directly exchange data. The data communication is not performed via a mobile phone base station or the Internet.

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[0021]

The time information distribution station 30 is a station that transmits time information 40 to the terminal stations 10 and 20. For example, a GPS satellite or a CDMA base station can be used as the time information distribution station 30. In addition, a base station that transmits a standard radio wave (time information) to the radio timepiece may be used. Each of the terminal stations 10 and 20 can acquire the accurate current time by receiving the time information 40 transmitted from the time information distribution station 30.

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[0022]

Next, the synchronization control method will be described. First, it is assumed that the terminal stations 10 and 20 store the same content data to be controlled in the memory cards 12 and 22. Here, the content data to be controlled is information whose expression content changes with time, such as moving image data and audio data.

[0023]

Then, the terminal station 10 transmits three pieces of information of content ID 41, control type information 42, and control start information 43 to the terminal station 20.

[0024]

The content ID 41 is information specifying content data to be controlled. The terminal stations 10 and 20 can store a plurality of content data in the memory cards 12 and 22. Therefore, by transmitting the content ID 41, the terminal station 10 and the terminal station 20 can control the same content data.

[0025]

The control type information 42 is information for designating control details for the content data designated by the content ID 41. The control contents include, for example, "reproduce content data", "fast forward content data", "rewind content data", "slow play content data", and the like.

[0026]

The control start information 43 is information specifying a time to start control of the content data specified by the content ID 41.

[0027]

When the content ID 41, the control type information 42, and the control start information 43 are transmitted from the terminal station 10 to the terminal station 20, the terminal station 10 and the terminal station 20 are connected at the time specified by the control start information 43. Then, the control of the content data designated by the content ID 41 is started. At this time, the terminal station 10 and the terminal station 20 control the content data according to the control content specified by the control type information 42. Here, as described above, the terminal station 10 and the terminal station 20 always acquire the time information 40 from the time information distribution station 30 and acquire the absolute time. Therefore, by starting the control at the time specified by the control start information 43 based on the time information 40, it is possible to control the content data synchronized in time between the terminal stations 10 and 20.

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[0028]

{Second Embodiment}

The second embodiment of the present invention will be described with reference to FIGS. 2 and 3. The synchronous control system in the second embodiment includes two terminal stations 10 and 20. As in the first embodiment, the terminal stations 10 and 20 are composed of mobile phones 11 and 21 and are capable of accessing various content data stored in the memory cards 21 and 22. In addition, as in the first embodiment, in the following description, the terminal stations 10 and 20 directly exchange data by performing short-range wireless communication such as infrared wireless communication and Bluetooth.

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[0029]

Next, the synchronization control method will be described. First, it is assumed that the terminal stations 10 and 20 store the same content data to be controlled in the memory cards 12 and 22. Note that content data is the same as that in the first embodiment.

[0030]

First, the terminal station 10 transmits an inquiry command 61 to the terminal station 20. This inquiry command 61 is a command for inquiring the time from when the terminal station 20 receives the content data control instruction until it becomes possible to start control of the content data (this will be referred to as preparation time). The inquiry command 61 also serves as a command for measuring the time required for data transfer between the terminal station 10 and the terminal station 20 (this will be referred to as a delay time).

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[0031]

When receiving the inquiry command 61, the terminal station 20 transmits a response 62 indicating that the preparation time is X hours to the terminal station 10.

[0032]

Upon receiving the response 62, the terminal station 10 calculates a delay time. As shown in FIG. 3, if the time when the inquiry command 61 is transmitted is 0 and the time when the response 62 is received is Y, the delay time can be estimated as Y/2 hours. Alternatively, the delay time may be calculated in consideration of the time required from the terminal station 20 receiving the inquiry command 61 to transmitting the response 62.

[0033]

Then, the terminal station 10 transmits three pieces of information of the content ID 63, the control type information 64, and the control start instruction 65 to the terminal station 20.

[0034]

The content ID 63 is information specifying content data to be controlled. The terminal stations 10 and 20 can store a plurality of content data in the memory cards 12 and 22. Therefore, by transmitting the content ID 63, the terminal station 10 and the terminal station 20 can control the same content data.

[0035]

The control type information 64 is information for designating control details for the content data designated by the content ID 63. The control contents include, for example, “reproduce content data”, “fast forward content data”, “rewind content data”, “slow play content data”, and the like.

[0036]

The control start instruction 65 is data for instructing the terminal station 20 to immediately start control of the content data specified by the content ID 63.

[0037]

When the content ID 63, the control type information 64, and the control start instruction 65 are transmitted from the terminal station 10 to the terminal station 20, the terminal station 20 immediately converts the content data specified by the content ID 63 to the control type information. Control is started in accordance with the control content designated by 64. However, since the terminal station 20 requires a preparation time of X hours to start control of the content data, the control is actually started after X hours from the reception of the control start instruction 65.

[0038]

On the other hand, if the terminal station 10 sends the control start indication 65 at time Z, the terminal station 10 starts controlling the content data at time Z plus the delay and preparation time, that is, time $(Z+Y / 2+X)$. In other words, the terminal station 10 starts the control in consideration of the delay time required for transmission of the control start instruction 65 and the preparation time until the control is started in the terminal station 20. At this time, the terminal station 10 controls the content data according to the control content specified by the control type information 64. Thereby, the terminal station 10 and the terminal station 20 can reproduce the same content data in time synchronization.

[0039]

{Third embodiment}

With reference to FIG. 4 and FIG. 5, a third embodiment of the present invention will be described. The synchronization control system according to the third embodiment includes two terminal stations 10 and 20. As in the other embodiments, the terminal stations 10 and 20 are composed of mobile phones 11 and 21, and can access various content data stored in the memory cards 21 and 22. In addition, as in other embodiments, in the following description, each of the terminal stations 10 and 20 directly exchanges data by performing short-range wireless communication such as infrared wireless communication or BlueTooth.

[0040]

Next, the synchronization control method will be described. First, it is assumed that the terminal stations 10 and 20 store the same content data to be controlled in the memory cards 12 and 22. Note that the content data is the same as in other embodiments.

[0041]

First, the terminal station 10 transmits a measurement command 71 to the terminal station 20. The measurement command 71 is a command for measuring a time required for data transfer between the terminal station 10 and the terminal station 20 (this will be referred to as a delay time).

[0042]

When receiving the measurement command 71, the terminal station 20 transmits a response 72 to the measurement command 71 to the terminal station 10.

[0043]

When receiving the response 72, the terminal station 10 calculates a delay time. As shown in FIG. 5, if the time when the measurement command 71 is transmitted is 0 and the time when the response 72 is received is Y, the delay time can be estimated to be $Y/2$ hours. Alternatively, the terminal station 20 may calculate the delay time in consideration of the time required from receiving the measurement command 71 to transmitting the response 62.

[0044]

Next, the terminal station 10 starts transmission of the time code 73 to the terminal station 20. The time code 73 is a signal for time synchronization between the terminal station 10 and the terminal station 20. This signal does not need to be a signal indicating absolute time. Since the purpose is to achieve time synchronization between the terminal station 10 and the terminal station 20, for example, pulses at a predetermined interval and time information that serves as a point for giving a relative time to the pulses are transmitted. More specifically, while transmitting pulses at intervals of 1/1000 second, consecutive numbers (... 100, 101, 102,...) indicating relative time points every 1/10 second, etc. should be sent. The time code 73 is continuously transmitted thereafter.

[0045]

Then, in a state where the time code 73 is continuously transmitted, the terminal station 10 transmits three pieces of information of content ID 74, control type information 75, and control start information 76 to the terminal station 20.

[0046]

The content ID 74 is information specifying content data to be controlled. The terminal stations 10 and 20 can store a plurality of content data in the memory cards 12 and 22. Therefore, by transmitting the content ID 74, the terminal station 10 and the terminal station 20 can control the same content data.

[0047]

The control type information 75 is information for designating control details for the content data designated by the content ID 74. The control contents include, for example, "reproduce content data", "fast forward content data", "rewind content data", "slow play content data", and the like.

[0048]

The control start information 76 is information specifying a time to start control of the content data specified by the content ID 74. Here, the time designated by the control start information 76 is a time that can be designated by the time code 73. So it doesn't have to be absolute time.

[0049]

When these content ID 74, control type information 75, and control start information 76 are transmitted from the terminal station 10 to the terminal station 20, the terminal station 20 controls the control start information based on the time code 73 continuously received. Control of the content data specified by the content ID 74 is started at the time specified by 76. At this time, the terminal station 20 controls the content data according to the control content specified by the control type information 75.

[0050]

On the other hand, the terminal station 10 begins to control the content data specified by the content ID 74 after a delay time (Y/2 hours) has elapsed from the time specified by the control start information 76 based on the continuously transmitting time code 73. In this case, the terminal station 10 controls the content data according to the control content specified in the control type information 75. In other words, although time synchronization is to be performed based on the same time code 73, the terminal station 10 takes this time into account because a delay time occurs in the transmission of the time code 74 itself. Thereby, the terminal station 10 and the terminal station 20 can reproduce the same content data in synchronization.

[0051]

It should be noted that the timing of starting transmission of the time code 73 is not limited to the above timing. The time code 73 may be transmitted at an arbitrary timing until the control start time.

[0052]

{Modification}

In the above embodiment, the method of performing the synchronization control of content data between two terminal stations has been described. However, the synchronization control may be performed between three or more terminal stations. In this case, one master station (corresponding to the terminal station 10) provides content

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ID, control type information, control start information to a plurality of terminal stations (corresponding to the terminal station 20). A control start instruction or the like may be transmitted.

[0053]

Also, in the above embodiment, the content data is stored in the memory cards 12 and 22, but this is not always necessary. If the mobile phone has sufficient internal memory, the content data may be stored in the main body. Further, the content data may be downloaded using the Internet connection function of the mobile phone.

[0054]

{Application example}

<1. Practical learning>

As one application example of the present invention, it is effective to use the synchronous control method in a practical learning field. A plurality of students have a mobile phone (corresponding to the terminal station 20) as a terminal station, and a teacher has a mobile phone (corresponding to the terminal station 10) as a master station. Then, learning material data as content data is stored in a memory card and distributed to each student. A memory card storing the same content data is also inserted into the master station.

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[0055]

Then, the teacher conducts the class while reproducing the same content data in time synchronization on the cellular phone of the teacher and the student. For example, in the case of practical learning, the teacher adds verbal explanation while reproducing a moving image indicating the practical technique. At this time, since the moving images viewed by the teacher and students are synchronized in time, the explanation of the teacher and the images viewed by the students will not be misaligned even if the content is very detailed, making it possible to conduct lessons smoothly. In addition, each student can refer to his/her mobile phone regardless of which direction he/she is facing, and thus can pay attention to the teaching material. And even in a practical learning environment without a video distribution server or personal computer, it is possible for each student to view the synchronized video (or audio) controlled by the teacher at their fingertips, making it possible to conduct more dense lessons.

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[0056]

Thus, it is effective to use the present invention in practical skill learning. In addition, as described above, by distributing the memory card to each student, it is possible to easily share the content data, and this can be said to be one effect of storing the content data in the memory card.

[0057]

In physical education classes, it is also effective to play back model performances synchronously at each terminal station and to use them in skills education.

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[0058]

<2. In-person presentation>

As one application example of the present invention, it is effective to use the synchronous control method in a face-to-face sales presentation. Conventionally, there has been a method of using a notebook computer when making presentations using video. However, in this case, it is necessary to line up side by side because the person explaining and the person receiving the explanation must see the same notebook computer video. Therefore, there is a problem that the person who explains the operation is complicated and the person who receives the explanation cannot see the video in front. It is also a big deal to use a projector or the like.

[0059]

Therefore, as shown in FIG. 6, the presenter 81 has a terminal station 83 (corresponding to the terminal station 10), and the customer 82 also has a terminal station 84 (corresponding to the terminal station 20). Then, the explainer 81 inserts the memory card storing the sales content data into the terminal station 83 owned by the presenter 81 and also inserts the memory card storing the same content data into the terminal station 84 of the customer 82. The explainer 81 performs sales while synchronously reproducing the content data. With this method, the explainer 81 can make a sales presentation using time-synchronized video while conversing face-to-face with the customer 82.

[0060]

<3. Entertainment>

As one application example of the present invention, it is effective to use the synchronous control method in an entertainment field. For example, in a multiplayer game, it is effective to synchronously reproduce a moving image background image. In the case of a competitive multiplayer game, it is possible to reproduce a background image that is completely synchronized on both terminals that are competing. Even in a narrow-band network environment, it is possible to synchronize and reproduce a powerful moving image background image stored in a memory card in addition to the 3D-CG object for a long time.

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[0061]

It is also effective to apply it to a multiplayer wireless rhythm action game. A multiplayer wireless rhythm action game, for example, is that each player who owns each terminal station is in charge of the guitar part, bass part, drum part, etc., and performs synchronized performance while performing key operations. In this case as well, the basic tracks played back at each terminal station are completely synchronized, and the “matching” or “shifting” common rhythm sense among members of multiple groups competes. It becomes possible to realize a “rhythm groove battle game” or the like.

[Brief Description of Drawings]

[0062]

[FIG. 1] is an overall view of a synchronous control system according to a first embodiment.

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[FIG. 2] is an overall view of a synchronous control system according to a second embodiment.

[FIG. 3] is a sequence diagram of a synchronous control system according to a second embodiment.

[FIG. 4] is an overall view of a synchronous control system according to a third embodiment.

[FIG. 5] is a sequence diagram of a synchronous control system according to a third embodiment.

[FIG. 6] is a diagram showing an image of the use of the present invention.

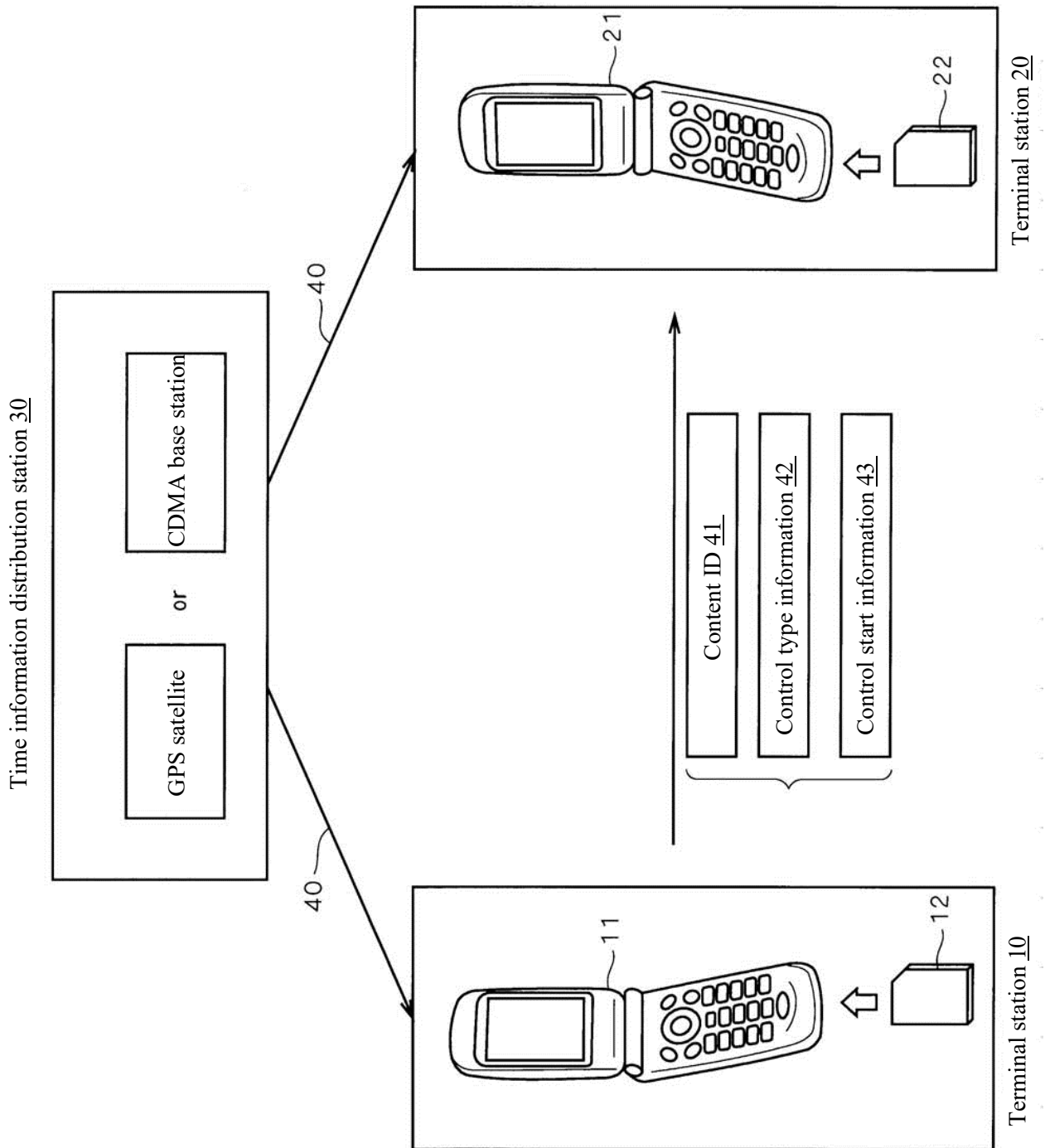
[Reference Signs List]

[0063]

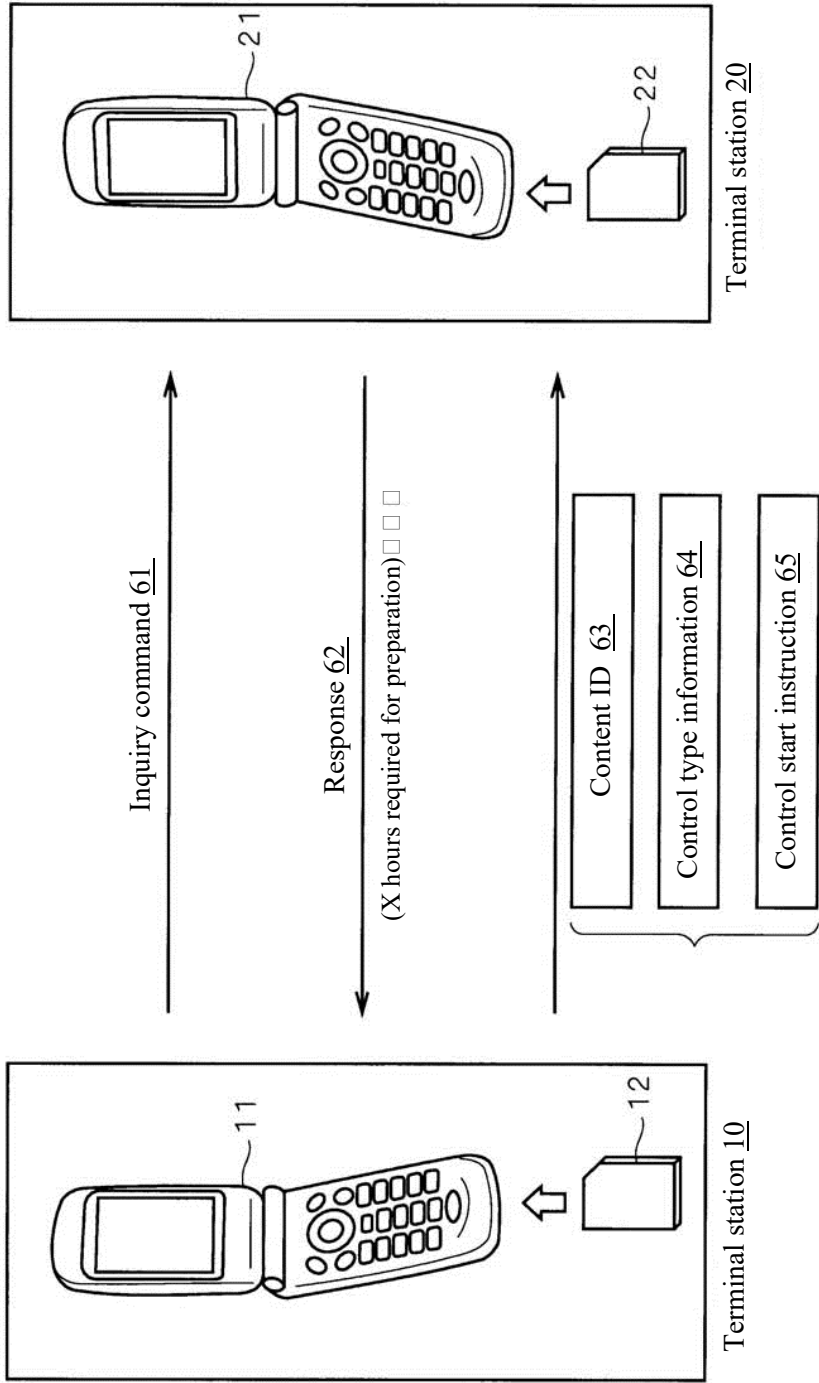
10, 20	Terminal station
11, 21	Mobile phone body
12, 22	Memory card
30	Time information distribution station
83, 84	Notebook PC

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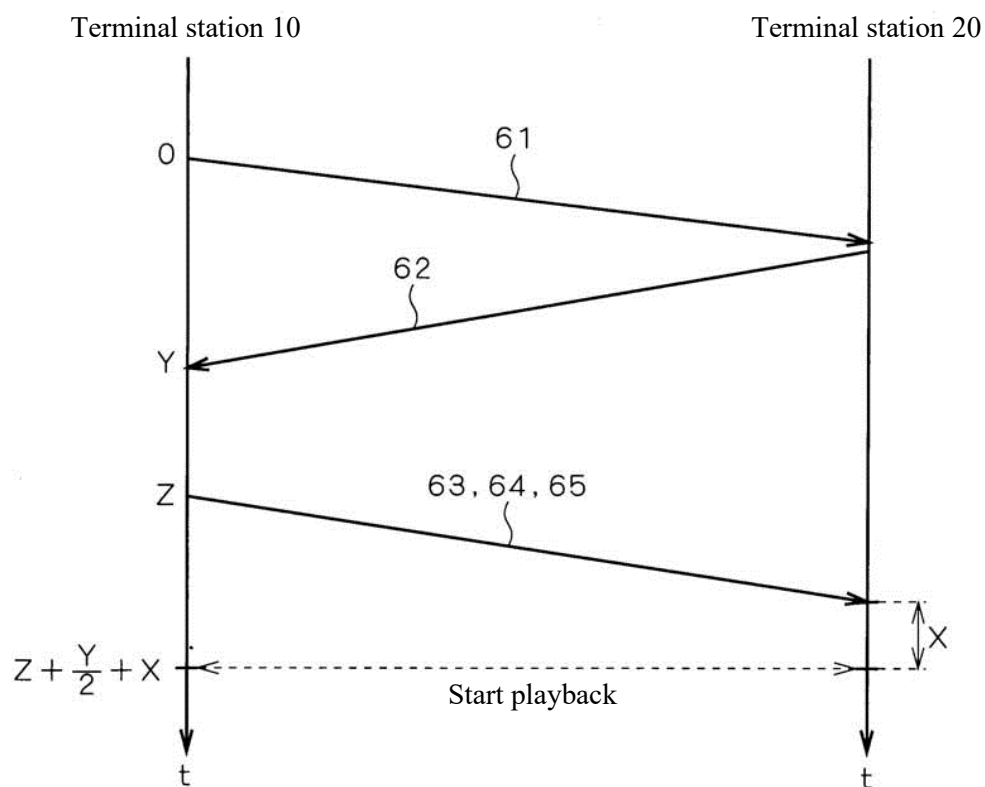
[FIG. 1]



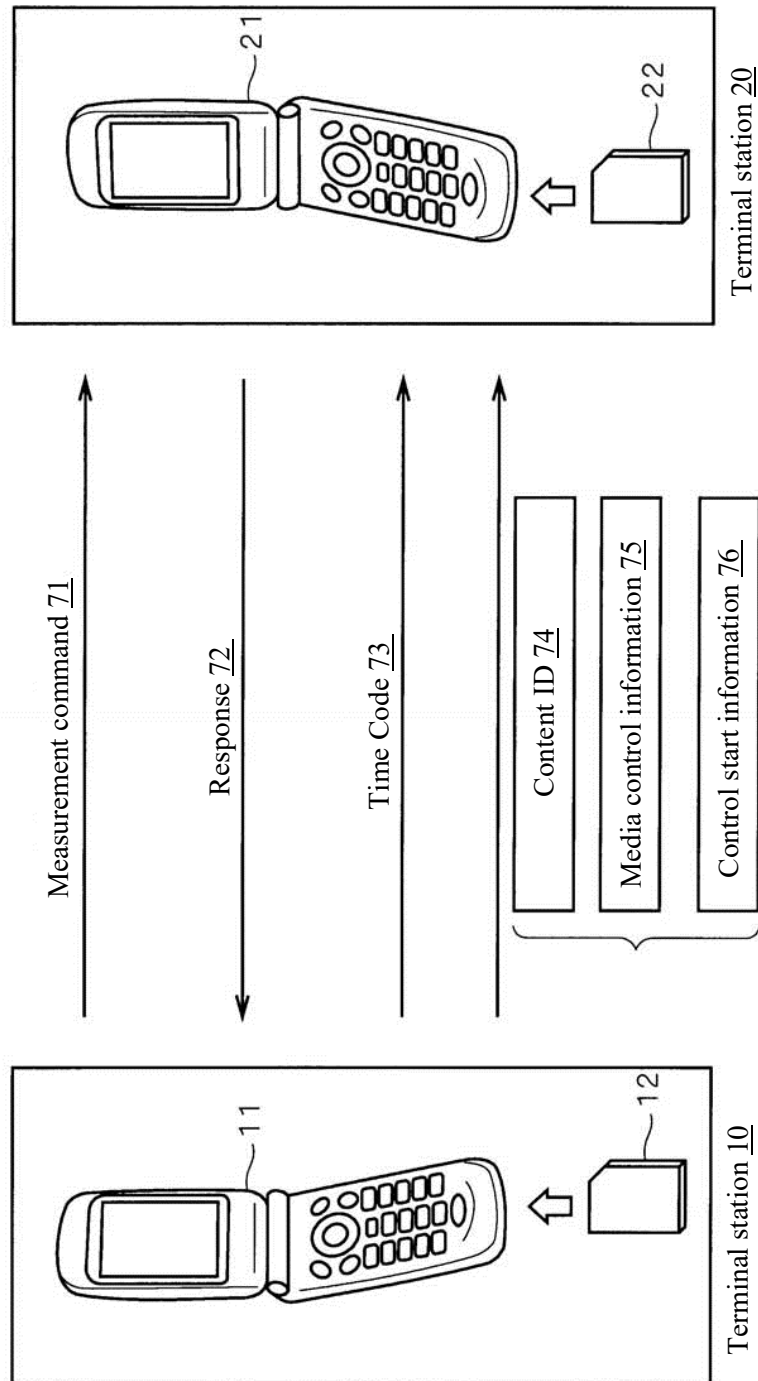
[FIG. 2]



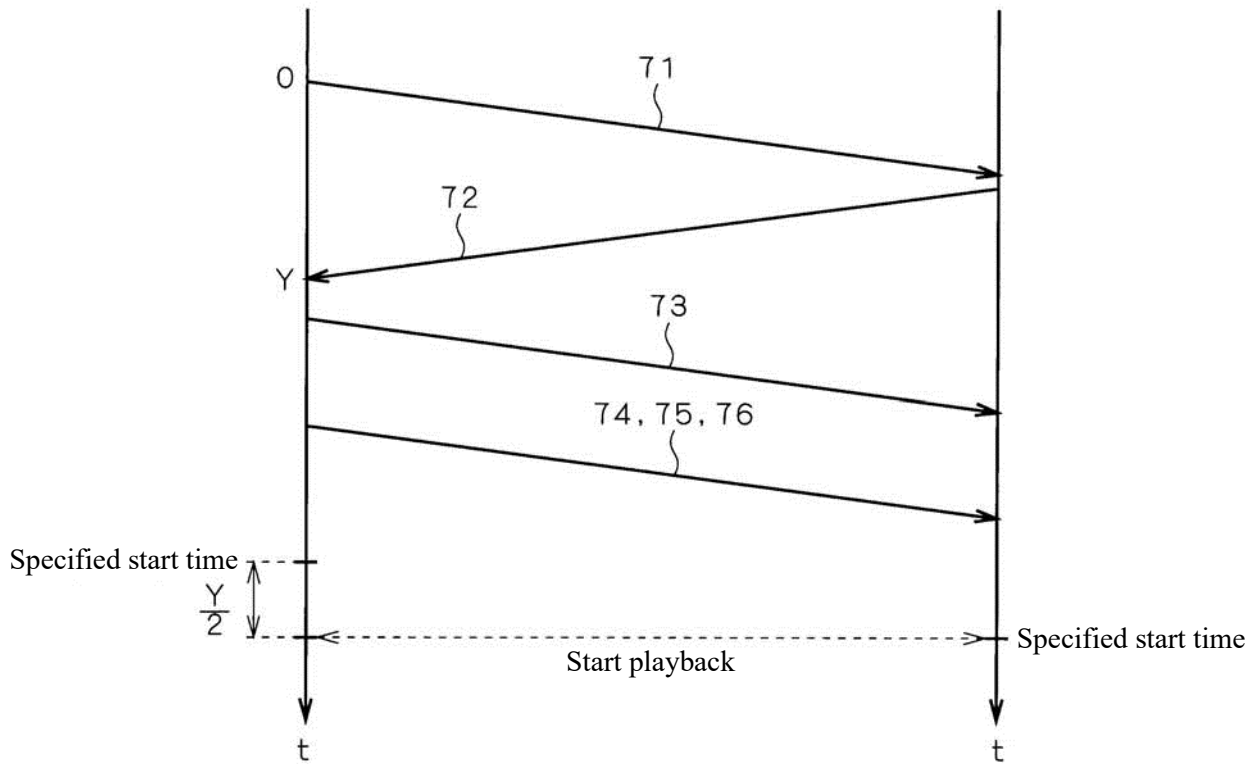
[FIG. 3]



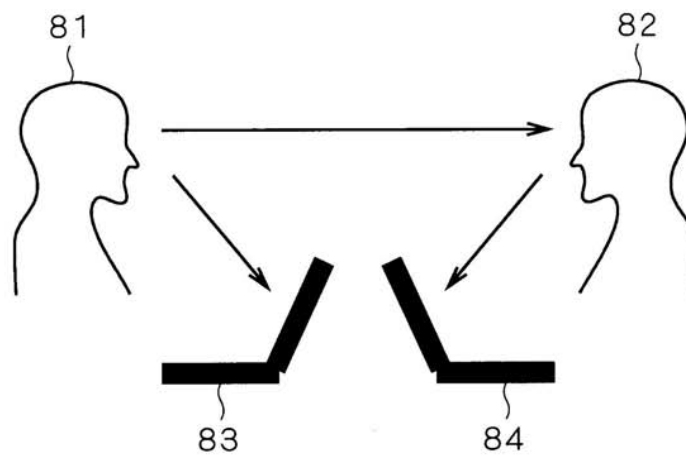
[FIG. 4]



[FIG. 5]



[FIG. 6]



Continued from the front page

F term (reference) 5K067 AA21 BB04 BB21 DD17 DD25 DD30 EE02 EE25 EE35
FF05 FF31 GG01
5K101 KK18 KK20 LL12 MM07 RR13