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(54) REMOTE CONTROL SYSTEM AND REMOTE CONTROL PROGRAM

FERNSTEUERUNGSSYSTEM UND FERNSTEUERUNGSPROGRAMM

SYSTÈME ET PROGRAMME DE COMMANDE À DISTANCE

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(56) References cited:
**JP-A- 2001 238 274 JP-A- 2003 304 342
JP-A- 2005 175 776**

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Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to a remote control system and a remote control program.

2. Description of the Related Art

[0002] Home electric appliances have been commercialized that are capable of grasping, through position information services provided using GPSs, present positions of portable terminals (cellular phones, smart phones, and tablet terminals) and causing the portable terminals to start or stop operations of the home electric appliances from the outside of homes according to the grasped present positions.

[0003] For example, Japanese Patent Application Laid-Open No. 2005-175776 discloses a remote control system that automatically enables control of information apparatuses such as home information appliances when fixed conditions registered in advance are satisfied even if a user does not actively perform operation, or prevents the user from forgetting the operation and enables the control of the information apparatuses by notifying the user of various statuses of the home information appliances.

[0004] However, with the remote control system, although it is possible to cause control target apparatuses to operate according to the transition of the position of the user and the approach of the user, the user cannot perform a setting change. Therefore, the remote control system can perform only the operations set in advance. JP 2003 304342 A discloses a remote control system and portable terminals and a management device used therefore. This document discloses a remote control management device which determines whether a remote control portable terminal is present in a position determination area or not when a predetermined determination time comes. If it exists, the remote control management device makes effective setting of an incoming timer controlling operation of the object device to be controlled. If it does not exist, the remote control management device makes setting of the incoming timer controlling the operation of the control objective device ineffective. The remote control portable terminal determines whether it enters in a going-in and going-out determination area. If it enters, it notifies the remote control management device to the effect. The remote control management device when receiving the notification starts the control device. JP 2001 238274 A discloses a remote control device. According to this document, a GPS antenna receives a radio wave from a GPS satellite, a GPS receiver demodulates it, a position calculation means calculates a current position of the mobile, and a display section displays the current position. The position calculation means detects

that the mobile enters a prescribed area and produces a discrimination signal. The position calculation means generates a control signal to apply on/off control to controlled system device corresponding to the discrimination signal and a communication means wirelessly transmits the control signal. A control device receives the control signal to apply on/off control to the controlled system device. Status information of the controlled system device can be acquired by the control signal.

[0005] The present invention has been devised in view of the above and it is an object of the present invention to obtain a remote control system capable of, while preventing a user from forgetting to perform the setting of the remote control system, causing control target apparatuses to perform appropriate operations even when the user does not perform setting of the remote control system.

SUMMARY OF THE INVENTION

[0006] It is an object of the present invention to at least partially solve the problems in the conventional technology.

[0007] According to an aspect of the present invention, a remote control system including: a portable terminal; a server that acquires position information of the portable terminal; and a control target apparatus controlled from the server. The server stores a remote control execution boundary where the control of the control target apparatus is started and a remote control execution check boundary present in a position farther from a base where the control target apparatus is set than the remote control execution boundary, when the portable terminal crosses the remote control execution check boundary while approaching the base, the server transmits a control execution check message for the control target apparatus to the portable terminal, and when the portable terminal crosses the remote control execution boundary while approaching the base, the server controls the control target apparatus according to presence or absence of a response to the control execution check message and the content of the response.

[0008] According to another aspect of the present invention, a remote control system including: a portable terminal; a server that acquires position information of the portable terminal; and a control target apparatus controlled from the server. The server stores a remote control execution area that centers on a base where the control target apparatus is set and a remote control execution check area that centers on a position different from the base and does not overlap the remote control execution area, when the portable terminal exits the remote control execution check area, the server transmits a control execution check message for the control target apparatus to the portable terminal, and when the portable terminal enters the remote control execution area, the server controls the control target apparatus according to presence or absence of a response to the control execution check

message and the content of the response.

[0009] According to still another aspect of the present invention, a remote control system including: a portable terminal; a server that acquires position information of the portable terminal; and a control target apparatus controlled from the server. The server stores a remote control execution area that centers on a base where the control target apparatus is set and a remote control execution check area that centers on a position different from the base and does not overlap the remote control execution area, when the portable terminal exits the remote control execution check area, the server transmits a control execution check message for the control target apparatus to another portable terminal, and when the portable terminal, which exits the remote control execution check area, enters the remote control execution area, the server controls the control target apparatus according to presence or absence of a response to the control execution check message from the another portable terminal and the content of the response.

[0010] According to still another aspect of the present invention, a remote control program for acquiring position information of a portable terminal and controlling a control target apparatus, the remote control program causing a server to execute: a step of transmitting, when the portable terminal crosses a remote control execution check boundary while approaching a base, a control execution check message for the control target apparatus to the portable terminal; and a step of controlling, when the portable terminal crosses, while approaching the base, a remote control execution boundary where the control of the control target apparatus is started, the remote control execution boundary being present in a position closer to a base where the control target apparatus is set than the remote control execution check boundary, the control target apparatus according to presence or absence of a response to the control execution check message and the content of the response.

[0011] According to still another aspect of the present invention, a remote control program for acquiring position information of a portable terminal and controlling a control target apparatus, the remote control program causing a server to execute: a step of transmitting, when the portable terminal exits a remote control execution check area, a control execution check message for the control target apparatus to the portable terminal; and a step of controlling, when the portable terminal enters a remote control execution area that centers on a base where the control target apparatus is set and does not overlap the remote control execution check area, the control target apparatus according to presence or absence of a response to the control execution check message and the content of the response.

[0012] According to still another aspect of the present invention, a remote control program for acquiring position information of a portable terminal and controlling a control target apparatus, the remote control program causing a server to execute: a step of transmitting, when the port-

able terminal exits a remote control execution check area that centers on a base where the control target apparatus is set, a control execution check message for the control target apparatus to another portable terminal; and a step of controlling, when the portable terminal, which exits the remote control execution check area, enters a remote control execution area that centers on a base where the control target apparatus is set and does not overlap the remote control execution check area, the control target apparatus according to presence or absence of a response to the control execution check message from the another portable terminal and content of the response.

[0013] The above and other objects, features, advantages and technical and industrial significance of this invention will be better understood by reading the following detailed description of presently preferred embodiments of the invention, when considered in connection with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014]

Fig. 1 is a diagram of the configuration of a remote control system according to a first embodiment;

Fig. 2 is a schematic diagram for explaining operations performed after a remote control execution check area and a remote control execution area are set in the remote control system according to the first embodiment;

Figs. 3(A) to 3(C) are diagrams illustrating a remote control setting screen registered in the remote control system according to the first embodiment;

Fig. 4 is a flowchart for explaining the order of operations of the remote control system according to the first embodiment;

Fig. 5 is a schematic diagram for explaining operations performed after remote control execution check areas and remote control execution areas are set in a remote control system according to a third embodiment;

Figs. 6(A) to 6(C) are diagrams illustrating a remote control setting screen registered in the remote control system according to the third embodiment; and Fig. 7 is a flowchart for explaining the order of operations of the remote control system according to the third embodiment.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0015] Embodiments of the present invention are explained in detail below with reference to the drawings. Note that the present invention is not limited by the embodiments.

First Embodiment

[0016] Fig. 1 is a diagram of the configuration of a remote control system according to a first embodiment. The remote control system shown in Fig. 1 includes a portable terminal 10, a satellite 11, which is a global positioning system (GPS) satellite that grasps the position of the portable terminal 10, a server 12 functioning as a remote control server, a home electric appliance 13, a personal computer 14, a base station 15 that performs radio communication with the portable terminal 10, and a router 16 connected to the home electric appliance 13. The server 12, the personal computer 14, the base station 15, and the router 16 are connected to a network 20. As the home electric appliance 13, a refrigerator 13a and an air conditioner 13b are illustrated. However, the home electric appliance 13 is not limited to these appliances.

[0017] The portable terminal 10 carried by a user acquires present location information of the portable terminal 10 from the GPS satellite 11 and transmits the present location information to the server 12 via the network 20. The personal computer 14 is just an example of a terminal used when the user performs registration of control contents (for example, at home), and is not limited to a specific apparatus. Further, the personal computer 14 does not have to be always connected to the network 20 and only has to be connected to the network 20 according to necessity. As the network 20, the Internet can be raised as an example.

[0018] In the remote control system according to this embodiment, a remote control execution check area and a remote control execution area are set. Fig. 2 is a schematic diagram for explaining operations performed after a remote control execution check area 31 and a remote control execution area 30 are set in the remote control system according to this embodiment. In Fig. 2, as an example, the remote control execution area 30 is set around a user's home 40 in which the home electric appliance 13 is set and the remote control execution check area 31 is set around a company 41. The user sets the remote control execution check area 31 and the remote control execution area 30 in advance using the portable terminal 10 or the personal computer 14 in Fig. 1 connected to the network 20.

[0019] Figs. 3(A) and 3(B) are diagrams illustrating a remote control setting screen registered in the remote control system according to this embodiment. Area setting and operation setting are shown on the remote control setting screen shown in Figs. 3(A) to 3(C). As shown in Figs. 3(A) and 3(B), the area setting screen includes the remote control execution area (Fig. 3(A)) and the remote control execution check area (Fig. 3(B)). As shown in Fig. 3(C), on the operation setting screen, operations performed by control target apparatuses when the user goes out, when the user comes home, and when there is no response to a check message are shown.

[0020] For example, an air conditioner in a living room is turned off when the user goes out, turned on at set

temperature of 25°C if the room temperature is equal to or higher than 28°C when the user comes home, and turned off when there is no response to the check message. For example, a refrigerator operates in a power saving mode when the user goes out, operates in a normal operation mode when the user comes home, and operates in the power saving mode when there is no response to the check message. For example, a light in the living room is turned off when the user goes out, turned on when the user comes home, and turned off when there is no response to the check message.

[0021] Fig. 4 is a flowchart for explaining the order of operations of the remote control system according to this embodiment. The user registers the portable terminal 10 in the server 12 in advance. The user installs application software of the remote control system in the portable terminal 10. The user registers area setting (the remote control execution area 30 and the remote control execution check area 31) and operation setting during remote control using the portable terminal 10 or the personal computer 14 installed with the application software. As the operation setting during the remote control, not only ON/OFF of a power supply of a control target apparatus but also detailed setting can be performed. For example, if the control target apparatus is an air conditioner, the remote control system sets the air conditioner to be turned on only when the room temperature is equal to or higher than a predetermined temperature.

[0022] When the portable terminal 10 enters the remote control execution area 30, the remote control system does not always perform an operation for turning on the control target apparatus. As shown in Fig. 3(C), if the control target apparatus is a refrigerator, the remote control system performs switching of an operation mode when the portable terminal 10 enters the remote control execution area 30. Or, for example, if the control target apparatus is an automatic cleaner that automatically operates during the user's absence from home, the remote control system may be set to turn off the control target apparatus when the portable terminal 10 enters the remote control execution area 30.

[0023] Further, not only the position of the portable terminal 10 but also time can be used. For example, the remote control system may be set to execute the remote control after 5 o'clock in the evening or may be set to enable the remote control only between 10 o'clock in the morning and 5 o'clock in the evening.

[0024] After being set as explained above, when the portable terminal 10 exits the remote control execution range 30, the remote control system starts processing (step S11). When the processing is started, first, the server 12 issues a command to the home electric appliance 13 via the network 20 and the router 16, whereby remote control of an operation at the time of going out set in advance is executed (step S12). For example, the server 12 turns off the home electric appliance 13 or switches an operation mode of the home electric appliance 13. Thereafter, when the portable terminal 10 enters the re-

remote control execution check area 31 (for example, where a company is present) and thereafter exits the remote control execution check area 31 (for example, leaves the company), the server 12 transmits, to the portable terminal 10, a check message for checking whether the remote control is to be executed (step S13).

[0025] Regarding the check message, it may be the one that an application displays on a top screen of the portable terminal 10 or the one that is transmitted using an electronic mail. The check message is not limited to a specific form. The check message includes content for at least causing the user to select "whether the remote control is executed" and checking "whether operation setting is changed". When the operation setting is changed, the server 12 causes the user to input content to be changed. Operations to be performed after the server 12 transmits the check message to the portable terminal 10 are determined according to presence or absence of a response to the check message and content of the response.

[0026] First, the server 12 determines presence or absence of a response to the check message when the portable terminal 10 enters the remote control execution area 30 (step S14). As a result of the determination, if the response to the check message is absent (No at step S14), when the portable terminal 10 enters the remote control execution area 30 (step S17d), the server 12 performs an operation at the time of no response to the check message (see Fig. 3(C)) (step S18d). As a result of the determination, if the response to the check message is present (Yes at step S14), the processing shifts to step S15 and the server 12 performs the next determination.

[0027] The server 12 determines content of the response to "whether the remote control is to be executed" in the check message (step S15). As a result of the determination, if the remote control is not executed (No at step S15), even if the portable terminal 10 enters the remote control execution area 30 (step S17c), the server 12 does not execute the remote control (step S18c). As a result of the determination, if the remote control is executed (Yes at step S15), the processing shifts to step S16 and the next determination is performed.

[0028] Subsequently, the server 12 determines content of a response to "whether operation setting is changed" in the check message (step S16). As a result of the determination, if the operation setting is not changed (No at step S16), when the portable terminal 10 enters the remote control execution area 30 (step S17a), the server 12 executes the remote control according to the operation setting registered in advance or initial setting (step S18a). As a result of the determination, if the operation setting is changed (Yes at step S16), when the portable terminal 10 enters the remote control execution area 30 (step S17b), the server 12 executes the remote control according to the operation setting after the change (step S18b).

[0029] After steps S18a to S18d, the processing ends (step S19). In this way, it is possible to cause the remote

control system in this embodiment to operate. By remotely controlling the control target apparatus with the remote control system, it is possible to improve convenience for the user, prevent the user from forgetting to turn off the control target apparatus, and reduce power consumption.

[0030] Note that, in the above explanation, the four operation patterns are explained as the operations of the remote control system. However, even if the remote control is being executed to cause the control target apparatus to operate, if a communication between the portable terminal 10 and the server 12 is possible, the operation setting can be changed by application software or the like of the portable terminal 10.

[0031] The remote control system in this embodiment can be set to execute the remote control when the portable terminal 10 simply exits the remote control execution area 30 and enters the remote control execution area 30 again without entering the remote control execution check area 31. In this case, because there is no response to the check message, when the portable terminal 10 enters the remote control execution area 30, the remote control system performs a set operation. The set operation can be the operation at the time of no response to the check message at step S18d or can be an operation set in advance different from the operation at the time of no response to the check message.

[0032] Note that, in this embodiment, the remote control execution area and the remote control execution check area are set and the remote control system is caused to operate with the entrance into and exit from the areas as triggers. However, the present invention is not limited to this. An edge of the remote control execution area can be set as a remote control execution boundary and an edge of the remote control execution check area can be set as a remote control execution check boundary. That is, the present invention can also include a remote control system including a portable terminal, a server that acquires position information of the portable terminal, and a control target apparatus controlled from the server. The server stores a remote control execution boundary where the control of the control target apparatus is started and a remote control execution check boundary present in a position farther from a base where the control target apparatus is set than the remote control execution boundary. When the portable terminal crosses the remote control execution check boundary while approaching the base, the server transmits a control execution check message for the control target apparatus to the portable terminal. When the portable terminal crosses the remote control execution boundary while approaching the base, the server controls the control target apparatus according to presence or absence of a response to the control execution check message and content of the response.

Second Embodiment

[0033] A remote control system according to a second embodiment of the present invention is explained. In the remote control system, even if the portable terminal 10 repeats entrance into and exit from the remote control execution area 30, the operation of a control target apparatus is not unnecessarily switched by remote control. In the remote control system in this embodiment, a predetermined time from the entrance of the portable terminal 10 into the remote control execution area 30 and a predetermined time from the exit from the remote control execution area 30 of the portable terminal 10 are set as "area entrance and exit non-detection time". The operation of the control target apparatus is not switched by the remote control until this time elapses.

[0034] In general, a largest electric current flows when a power supply is turned on and off in the home electric appliance 13, which is the control target apparatus. Therefore, power consumption increases when the power supply is frequently turned on and off in the home electric appliance 13. For example, some air conditioner does not start for several minutes if operation is once stopped. If the power supply is frequently turned on and off, the operation of the home electric appliance 13 cannot be performed. In this way, if the operation is frequently switched by the remote control, the power consumption of the home electric appliance 13 increases or the home electric appliance 13 cannot be started.

[0035] A user only has to set the "area entrance and exit non-detection time" by adding an item to a remote control setting screen using the portable terminal 10 or the personal computer 14 installed with application software or the like. The user repeats entrance into and exit from the remote control execution area 30, for example, when the user notices something left behind after once exiting the remote control execution area 30 and returns to the user's home.

[0036] As explained above, the "area entrance and exit non-detection time" is provided by not switching the operation of the control target apparatus until the predetermined time elapses after the user once enters and exits the remote control execution area 30. Consequently, it is made possible to prevent the power supply of the control target apparatus from being frequently repeatedly turned on and off, suppress an increase in power consumption, and prevent the control target apparatus from not starting to operate. It is also made possible to suppress occurrence of a failure of the control target apparatus caused by the power supply of the control target apparatus being frequently repeatedly turned on and off.

[0037] Note that, in the remote control execution check area 31, even if the "area entrance and exit non-detection time" is not set, the number of transmission of a check message only has to be set to one.

Third Embodiment

[0038] A remote control system according to a third embodiment of the present invention is explained. The remote control system is used by portable terminals of a plurality of users. Fig. 5 is a schematic diagram for explaining operations performed after remote control execution check areas and remote control execution areas are set in the remote control system according to this embodiment. In an example shown Fig. 5, a first remote control execution area 30a is set around the user's home 40 where the home electric appliance 13 is set. A second remote control execution area 30b is set around a station 42. A first remote control execution check area 31a is set around the company 41, which is a place of work of a first user. A second remote control execution check area 31b is set around a school 43, which is a school to which a second user commutes. As shown in Fig. 5, the remote control execution area is not limited to the area around the user's home 40 and may be set around the station 42. When the remote control execution area is set around the station 42 in this way, for example, a user can turn on an air conditioner when the user arrives at a nearest station and can adjust the temperature and the like of a target area of the air conditioner in advance.

[0039] Figs. 6(A) to 6(C) are diagrams illustrating a remote control setting screen registered in the remote control system according to this embodiment. Figs. 6(A) to 6(C) are different from Figs. 3(A) to 3(C) in the first embodiment only in a remote control execution area and a remote control execution check area. Operation setting is the same.

[0040] Fig. 7 is a flowchart for explaining the order of operations of the remote control system according to this embodiment. The users register a portable terminal 10a of the first user and a portable terminal 10b of the second user in the server 12 in advance. The users install application software for remote control in the portable terminals 10a and 10b. The users register area setting (the first remote control execution area 30a, the second remote control execution area 30b, the first remote control execution check area 31a, and the second remote control execution check area 31b) and operation setting during remote control using the portable terminals 10a and 10b installed with the application software.

[0041] The operation setting during the remote control enables not only ON and OFF of a power supply of a control target apparatus but also detailed setting. For example, if the control target apparatus is an air conditioner, as in the first embodiment, the air conditioner can be set to be turned on only when a room temperature is equal to or higher than a predetermined temperature, an operation for turning on the control target apparatus is not always performed when the portable terminals 10a and 10b enter the remote control execution area 30, not only the positions of the portable terminals 10a and 10b but also time can also be used. Therefore, redundant explanation is omitted and the explanation of the first embod-

iment shall apply.

[0042] The portable terminals 10a and 10b can be registered in the server 12, the area setting and the operation setting for the portable terminal 10a can be performed by the portable terminal 10b, and the area setting and the operation setting for the portable terminal 10b can be performed by the portable terminal 10a. Alternatively, as in the first embodiment, the area setting and the operation setting for the portable terminals 10a and 10b can be performed from a terminal (a personal computer) other than the portable terminals 10a and 10b.

[0043] After the setting is performed in advance in this way, when the portable terminal 10a and the portable terminal 10b exit the remote control execution area 30, the remote control system starts processing (step S21). When the processing is started, first, the remote control system performs processing same as steps S12 to S18a, S18b, S18c, and S18d in Fig. 4 of the first embodiment (step S22). In this explanation, both of the portable terminals 10a and 10b exit the remote control execution area 30. However, remote control content can be set for each of the users when the users are going out. Thereafter, when the second user comes home earlier, remote control for the second user is executed when the portable terminal 10b enters the second remote control execution area 30b.

[0044] The server 12 determines, referring to the positions of the portable terminals 10a and 10b, whether there is any portable terminal that does not correspond to the executed remote control content (step S23) between those two portable terminals. As a result of the determination, if there is not any portable terminal that does not correspond to the executed remote control content (No at step S23), the server 12 does not transmit a message to the other of those two portable terminals or the like, and the processing ends (step S26). As a result of the determination, if there is a portable terminal that does not correspond to the executed remote control content (Yes at step S23), the server 12 determines whether transmission of a check message is necessary (step S24). As a result of the determination, if the transmission of the check message is unnecessary (No at step S24), the processing ends (step S26). As a result of the determination, if the transmission of the check message is necessary (Yes at step S24), for example, the server 12 transmits a message for informing that the remote control has been executed to the portable terminal that does not correspond to the executed remote control content and notifies to this effect (step S25). Thereafter, the processing ends (step S26).

[0045] With the remote control system in this embodiment, it is made possible to execute the remote control adapted to a life scene of each of the users. For example, each of the users can learn whether or not the other user has come home. The portable terminal registered in the server 12 is not limited to a high-performance portable terminal such as a smart phone or a tablet, but may be a GPS transmitter capable of communicating with the

network 20. By adopting such a configuration, it is possible to manage a user who does not own a high-performance portable terminal such as a smart phone. For example, parents can give their child a GPS transmitter capable of communicating with the network 20 and manage the GPS transmitter.

[0046] Further, the operation setting for the control target apparatus can be different for each of the users. For example, rooms where an air conditioner is turned on can be set differently for each of the users who enters the control execution area.

[0047] In the first to third embodiments, the portable terminals 10, 10a, and 10b can be registered by the other terminals in advance rather than by the portable terminals 10, 10a, and 10b themselves. Therefore, the portable terminals 10, 10a, and 10b do not need to have a function for performing such setting registration. In the first to third embodiments, the other terminals can receive and respond to the control execution check message rather than the portable terminals 10, 10a, and 10b themselves that cross the boundary. Therefore, the portable terminals 10, 10a, and 10b do not need to be capable of receiving and responding to the control execution check message. The portable terminals 10, 10a, and 10b only have to have a configuration capable of transmitting position information to the server 12. That is, the portable terminal that crosses the remote control execution check boundary while approaching the base can operate as a cellular phone or a GPS transmitter including a GPS function, and the other portable terminals can receive the control execution check message.

[0048] The remote control system is explained in the first to third embodiments. However, a remote control program that realizes the remote control system is also included in the present invention. The remote control program can be stored on the server side or can be stored on the portable terminal side.

[0049] According to the present invention, there is an effect that it is possible to, while preventing a user from forgetting to perform the setting of the remote control system, cause control target apparatuses to perform appropriate operations even when the user does not perform setting of the remote control system.

[0050] Although the invention has been described with respect to specific embodiments for a complete and clear disclosure, the appended claims are not to be thus limited but are to be construed as embodying all modifications and alternative constructions that may occur to one skilled in the art that fairly fall within the basic teaching herein set forth.

Claims

1. A remote control system comprising:

- a portable terminal (10);
- a server (12) adapted to acquire position infor-

mation of the portable terminal; and
 a control target apparatus (13) controlled from
 the server, wherein
 the server adapted to store a remote control ex-
 ecution boundary where the control of the con- 5
 trol target apparatus is started and a remote con-
 trol execution check boundary present in a po-
 sition farther from a base (40) where the control
 target apparatus is set than the remote control
 execution boundary, 10
 when the portable terminal crosses the remote
 control execution check boundary while ap-
 proaching the base, the server transmits a con-
 trol execution check message for the control tar-
 get apparatus to the portable terminal, and 15
 when the portable terminal crosses the remote
 control execution boundary while approaching
 the base, the server controls the control target
 apparatus according to presence or absence of
 a response to the control execution check mes- 20
 sage and the content of the response.

2. A remote control system comprising:

a portable terminal (10); 25
 a server (12) adapted to acquire position infor-
 mation of the portable terminal; and
 a control target apparatus (13) controlled from
 the server, wherein
 the server adapted to store a remote control ex- 30
 ecution area (30) that centers on a base (40)
 where the control target apparatus is set and a
 remote control execution check area (31) that
 centers on a position different from the base and
 does not overlap the remote control execution 35
 area,
 when the portable terminal exits the remote con-
 trol execution check area, the server transmits
 a control execution check message for the con-
 trol target apparatus to the portable terminal, 40
 and
 when the portable terminal enters the remote
 control execution area, the server controls the
 control target apparatus according to presence
 or absence of a response to the control execu- 45
 tion check message and the content of the re-
 sponse.

3. A remote control system comprising:

a portable terminal (10a); 50
 a server (12) adapted to acquire position infor-
 mation of the portable terminal; and
 a control target apparatus (13) controlled from
 the server, wherein
 the server adapted to store a remote control ex- 55
 ecution area (30a) that centers on a base where
 the control target apparatus is set and a remote

control execution check area (31a) that centers
 on a position different from the base and does
 not overlap the remote control execution area,
 when the portable terminal exits the remote con-
 trol execution check area, the server transmits
 a control execution check message for the con-
 trol target apparatus to another portable terminal
 (10b), and
 when the portable terminal, which exits the re-
 mote control execution check area, enters the
 remote control execution area, the server con-
 trols the control target apparatus according to
 presence or absence of a response to the control
 execution check message from the another por-
 table terminal and the content of the response.

4. The remote control system according to claim 3,
 wherein
 the portable terminal that crosses the remote control
 execution check area while approaching the base
 includes a GPS function, and
 the another portable terminal includes a configura-
 tion capable of receiving and responding to the con-
 trol execution check message.

5. The remote control system according to any one of
 claims 2 to 4, wherein the remote control system
 does not detect entrance into and exit from the re-
 mote control execution area of the portable terminal
 until a set period elapses after the portable terminal
 enters the remote control execution area.

6. A remote control program for acquiring position in-
 formation of a portable terminal (10) and controlling
 a control target apparatus (13), the remote control
 program causing a server (12) to execute:

a step of transmitting, when the portable terminal
 crosses a remote control execution check
 boundary while approaching a base (40), a con-
 trol execution check message for the control tar-
 get apparatus to the portable terminal; and
 a step of controlling, when the portable terminal
 crosses, while approaching the base, a remote
 control execution boundary where the control of
 the control target apparatus is started, the re-
 mote control execution boundary being present
 in a position closer to a base (40) where the con-
 trol target apparatus is set than the remote con-
 trol execution check boundary, the control target
 apparatus according to presence or absence of
 a response to the control execution check mes-
 sage and the content of the response.

7. A remote control program for acquiring position in-
 formation of a portable terminal (10) and controlling
 a control target apparatus (13), the remote control
 program causing a server (12) to execute:

a step of transmitting, when the portable terminal exits a remote control execution check area (31), a control execution check message for the control target apparatus to the portable terminal; and

a step of controlling, when the portable terminal enters a remote control execution area (30) that centers on a base (40) where the control target apparatus is set and does not overlap the remote control execution check area, the control target apparatus according to presence or absence of a response to the control execution check message and the content of the response.

8. A remote control program for acquiring position information of a portable terminal (10a) and controlling a control target apparatus (13), the remote control program causing a server (12) to execute:

a step of transmitting, when the portable terminal exits a remote control execution check area (31a) that centers on a base (40) where the control target apparatus is set, a control execution check message for the control target apparatus to another portable terminal (10b); and

a step of controlling, when the portable terminal, which exits the remote control execution check area, enters a remote control execution area (30a) that centers on a base (40) where the control target apparatus is set and does not overlap the remote control execution check area, the control target apparatus according to presence or absence of a response to the control execution check message from the another portable terminal and content of the response.

Patentansprüche

1. Fernsteuersystem, umfassend:

ein tragbares Endgerät (10);
einen Server (12), der ausgelegt ist, um Positionsinformationen des tragbaren Endgeräts zu erwerben; und
eine Steuerzielvorrichtung (13), die vom Server gesteuert wird, wobei
der Server ausgelegt ist, um eine Fernsteuerungsausführungsgrenze, wo die Steuerung der Steuerzielvorrichtung gestartet wird, und eine Fernsteuerungsausführungsprüfgrenze, die an einer Position vorhanden ist, die von einer Basis (40), wo die Steuerzielvorrichtung angeordnet ist, weiter entfernt ist als die Fernsteuerungsausführungsgrenze, zu speichern,
wenn das tragbare Endgerät die Fernsteuerungsausführungsprüfgrenze bei Annäherung an die Basis überschreitet, der Server eine Steuer-

erungsausführungsprüfnachricht für die Steuerzielvorrichtung an das tragbare Endgerät überträgt, und

wenn das tragbare Endgerät die Fernsteuerungsausführungsgrenze bei Annäherung an die Basis überschreitet, der Server die Steuerzielvorrichtung entsprechend Vorhandensein oder Nichtvorhandensein einer Antwort auf die Steuerungsausführungsprüfnachricht und dem Inhalt der Antwort steuert.

2. Fernsteuersystem, umfassend:

ein tragbares Endgerät (10);
einen Server (12), der eingerichtet ist, um Positionsinformationen des tragbaren Endgeräts zu erwerben; und
eine Steuerzielvorrichtung (13), die vom Server gesteuert wird, wobei
der Server eingerichtet ist, um einen Fernsteuerungsausführungsbereich (30), der auf eine Basis (40) zentriert, wo die Steuerzielvorrichtung angeordnet ist, und einen Fernsteuerungsausführungsprüfbereich (31), der auf eine von der Basis verschiedene Position konzentriert, und den Fernsteuerungsausführungsbereich nicht überschneidet, zu speichern,
wenn das tragbare Endgerät den Fernsteuerungsausführungsprüfbereich verlässt, der Server eine Steuerungsausführungsprüfnachricht für die Steuerzielvorrichtung an das tragbare Endgerät überträgt, und
wenn das tragbare Endgerät in den Fernsteuerungsausführungsbereich eintritt, der Server die Steuerzielvorrichtung entsprechend Vorhandensein oder Nichtvorhandensein von einer Antwort auf die Steuerungsausführungsprüfnachricht und dem Inhalt der Antwort steuert.

3. Fernsteuersystem, umfassend:

ein tragbares Endgerät (10a);
einen Server (12), der eingerichtet ist, um Positionsinformationen des tragbaren Endgeräts zu erwerben; und
eine Steuerzielvorrichtung (13), die vom Server gesteuert wird, wobei
der Server eingerichtet ist, um einen Fernsteuerungsausführungsbereich (30a), der auf eine Basis zentriert, wo die Steuerzielvorrichtung angeordnet ist, und einen Fernsteuerungsausführungsprüfbereich (31a), der auf eine von der Basis verschiedene Position konzentriert, und den Fernsteuerungsausführungsbereich nicht überschneidet, zu speichern,
wenn das tragbare Endgerät den Fernsteuerungsausführungsprüfbereich verlässt, der Server eine Steuerungsausführungsprüfnachricht

für die Steuerzielvorrichtung an ein anderes tragbares Endgerät (10b) überträgt, und wenn das tragbare Endgerät, welches den Fernsteuerungsausführungsprüfbereich verlässt, in den Fernsteuerungsausführungsbereich eintritt, der Server die Steuerzielvorrichtung entsprechend Vorhandensein oder Nichtvorhandensein von einer Antwort auf die Steuerungsausführungsprüfnachricht von dem anderen tragbaren Endgerät und dem Inhalt der Antwort steuert.

4. Fernsteuersystem nach Anspruch 3, wobei das tragbare Endgerät, das den Fernsteuerungsausführungsprüfbereich bei Annäherung an die Basis überschreitet, eine GPS-Funktion aufweist, und das andere tragbare Endgerät eine Konfiguration aufweist, die Empfangen der und Antworten auf die Steuerungsausführungsprüfnachricht ermöglicht.
5. Fernsteuersystem nach einem der Ansprüche 2 bis 4, wobei das Fernsteuersystem Eintritt in und Austritt aus dem Fernsteuerungsausführungsbereich des tragbaren Endgeräts nicht detektiert, bis ein eingestellter Zeitraum abläuft, nachdem das tragbare Endgerät in den Fernsteuerungsausführungsbereich eintritt.
6. Fernsteuerprogramm zum Erwerben von Positionsinformationen eines tragbaren Endgeräts (10) und Steuern einer Steuerzielvorrichtung (13), wobei das Fernsteuerprogramm einen Server (12) veranlasst, auszuführen:

einen Schritt des Übertragens, wenn das tragbare Endgerät eine Fernsteuerungsausführungsprüfgrenze bei Annäherung an eine Basis (40) überschreitet, einer Steuerungsausführungsprüfnachricht für die Steuerzielvorrichtung an das tragbare Endgerät; und einen Schritt des Steuerns, wenn das tragbare Endgerät bei Annäherung an die Basis eine Fernsteuerungsausführungsgrenze, wo die Steuerung der Steuerzielvorrichtung gestartet wird, überschreitet, wobei die Fernsteuerungsausführungsgrenze an einer Position vorhanden ist, die zu einer Basis (40), wo die Steuerzielvorrichtung angeordnet ist, näher ist als die Fernsteuerungsausführungsprüfgrenze, der Steuerzielvorrichtung entsprechend Vorhandensein oder Nichtvorhandensein von einer Antwort auf die Steuerungsausführungsprüfnachricht und dem Inhalt der Antwort.

7. Fernsteuerprogramm zum Erwerben von Positionsinformationen eines tragbaren Endgeräts (10) und Steuern einer Steuerzielvorrichtung (13), wobei das Fernsteuerprogramm einen Server (12) veranlasst,

auszuführen:

einen Schritt des Übertragens, wenn das tragbare Endgerät den Fernsteuerungsausführungsprüfbereich (31) verlässt, einer Steuerungsausführungsprüfnachricht für die Steuerzielvorrichtung an das tragbare Endgerät; und einen Schritt des Steuerns, wenn das tragbare Endgerät in einen Fernsteuerungsausführungsbereich (30) eintritt, der auf eine Basis (40) zentriert, wo die Steuerzielvorrichtung angeordnet ist und den Fernsteuerungsausführungsprüfbereich nicht überschneidet, der Steuerzielvorrichtung entsprechend Vorhandensein oder Nichtvorhandensein von einer Antwort auf die Steuerungsausführungsprüfnachricht und dem Inhalt der Antwort.

8. Fernsteuerprogramm zum Erwerben von Positionsinformationen eines tragbaren Endgeräts (10a) und Steuern einer Steuerzielvorrichtung (13), wobei das Fernsteuerprogramm einen Server (12) veranlasst, auszuführen:

einen Schritt des Übertragens, wenn das tragbare Endgerät aus einem Fernsteuerungsausführungsprüfbereich (31a) austritt, der auf eine Basis (40) zentriert, wo die Steuerzielvorrichtung angeordnet ist, einer Steuerungsausführungsprüfnachricht für die Steuerzielvorrichtung an ein anderes tragbares Endgerät (10b); und einen Schritt des Steuerns, wenn das tragbare Endgerät, welches den Fernsteuerungsausführungsprüfbereich verlässt, in einen Fernsteuerungsausführungsbereich (30a) eintritt, der auf eine Basis (40) zentriert, wo die Steuerzielvorrichtung angeordnet ist, und den Fernsteuerungsausführungsprüfbereich nicht überschneidet, der Steuerzielvorrichtung entsprechend Vorhandensein oder Nichtvorhandensein von einer Antwort auf die Steuerungsausführungsprüfnachricht von dem anderen tragbaren Endgerät und Inhalt der Antwort.

Revendications

1. Système de commande à distance comprenant :

un terminal portable (10) ;
un serveur (12) apte à acquérir des informations de position du terminal portable ; et
un appareil cible de commande (13) commandé à partir du serveur, dans lequel :

le serveur est apte à stocker une limite d'exécution de commande à distance où la commande de l'appareil cible de commande

de est démarrée, et une limite de vérification d'exécution de commande à distance présente dans une position plus éloignée d'une base (40) où l'appareil cible de commande est défini que la limite d'exécution de commande à distance ;

lorsque le terminal portable franchit la limite de vérification d'exécution de commande à distance tout en s'approchant de la base, le serveur transmet un message de vérification d'exécution de commande pour l'appareil cible de commande au terminal portable ; et

lorsque le terminal portable franchit la limite d'exécution de commande à distance tout en s'approchant de la base, le serveur commande l'appareil cible de commande selon la présence ou l'absence d'une réponse au message de vérification d'exécution de commande, et selon le contenu de la réponse.

2. Système de commande à distance comprenant :

un terminal portable (10) ;
un serveur (12) apte à acquérir des informations de position du terminal portable ; et
un appareil cible de commande (13) commandé à partir du serveur, dans lequel :

le serveur est apte à stocker une zone d'exécution de commande à distance (30) qui est centrée sur une base (40) où l'appareil cible de commande est défini, et une zone de vérification d'exécution de commande à distance (31) qui est centrée sur une position différente de la base et ne chevauche pas la zone d'exécution de commande à distance ;

lorsque le terminal portable quitte la zone de vérification d'exécution de commande à distance, le serveur transmet un message de vérification d'exécution de commande pour l'appareil cible de commande au terminal portable ; et

lorsque le terminal portable pénètre dans la zone d'exécution de commande à distance, le serveur commande l'appareil cible de commande selon la présence ou l'absence d'une réponse au message de vérification d'exécution de commande, et selon le contenu de la réponse.

3. Système de commande à distance comprenant :

un terminal portable (10a) ;
un serveur (12) apte à acquérir des informations de position du terminal portable ; et

un appareil cible de commande (13) commandé à partir du serveur, dans lequel :

le serveur est apte à stocker une zone d'exécution de commande à distance (30a) qui est centrée sur une base où l'appareil cible de commande est défini, et une zone de vérification d'exécution de commande à distance (31a) qui est centrée sur une position différente de la base et ne chevauche pas la zone d'exécution de commande à distance ;

lorsque le terminal portable quitte la zone de vérification d'exécution de commande à distance, le serveur transmet un message de vérification d'exécution de commande pour l'appareil cible de commande à un autre terminal portable (10b) ; et

lorsque le terminal portable, lequel quitte la zone de vérification d'exécution de commande à distance, pénètre dans la zone d'exécution de commande à distance, le serveur commande l'appareil cible de commande selon la présence ou l'absence d'une réponse au message de vérification d'exécution de commande provenant dudit un autre terminal portable, et selon le contenu de la réponse.

4. Système de commande à distance selon la revendication 3, dans lequel :

le terminal portable qui franchit la zone de vérification d'exécution de commande à distance tout en s'approchant de la base inclut une fonction GPS ; et

ledit un autre terminal portable inclut une configuration en mesure de recevoir le message de vérification d'exécution de commande, et d'y répondre.

5. Système de commande à distance selon l'une quelconque des revendications 2 à 4, dans lequel le système de commande à distance ne détecte pas l'entrée dans, et la sortie de, la zone d'exécution de commande à distance du terminal portable, jusqu'à ce qu'une période définie s'écoule après que le terminal portable a pénétré dans la zone d'exécution de commande à distance.

6. Programme de commande à distance pour acquérir des informations de position d'un terminal portable (10) et commander un appareil cible de commande (13), le programme de commande à distance amenant un serveur (12) à exécuter :

une étape consistant à transmettre, lorsque le terminal portable franchit une limite d'exécution

de commande à distance tout en s'approchant d'une base (40), un message de vérification d'exécution de commande pour l'appareil cible de commande au terminal portable ; et
 une étape consistant à commander, lorsque le terminal portable franchit, tout en s'approchant de la base, une limite d'exécution de commande à distance où la commande de l'appareil cible de commande est démarrée, la limite d'exécution de commande à distance étant présente dans une position plus proche d'une base (40) où l'appareil cible de commande est défini que la limite de vérification d'exécution de commande à distance, l'appareil cible de commande, selon la présence ou l'absence d'une réponse au message de vérification d'exécution de commande, et selon le contenu de la réponse.

7. Programme de commande à distance pour acquérir des informations de position d'un terminal portable (10) et commander un appareil cible de commande (13), le programme de commande à distance amenant un serveur (12) à exécuter :

une étape consistant à transmettre, lorsque le terminal portable quitte une zone de vérification d'exécution de commande à distance (31), un message de vérification d'exécution de commande pour l'appareil cible de commande, au terminal portable ; et
 une étape consistant à commander, lorsque le terminal portable pénètre dans une zone d'exécution de commande à distance (30) qui est centrée sur une base (40) où l'appareil cible de commande est défini et ne chevauche pas la zone de vérification d'exécution de commande à distance, l'appareil cible de commande selon la présence ou l'absence d'une réponse au message de vérification d'exécution de commande, et selon le contenu de la réponse.

8. Programme de commande à distance pour acquérir des informations de position d'un terminal portable (10a) et commander un appareil cible de commande (13), le programme de commande à distance amenant un serveur (12) à exécuter :

une étape consistant à transmettre, lorsque le terminal portable quitte une zone de vérification d'exécution de commande à distance (31a) qui est centrée sur une base (40) où l'appareil cible de commande est défini, un message de vérification d'exécution de commande pour l'appareil cible de commande, à un autre terminal portable (10b) ; et
 une étape consistant à commander, lorsque le terminal portable, lequel quitte la zone de vérification d'exécution de commande à distance,

pénètre dans une zone d'exécution de commande à distance (30a) qui est centrée sur une base (40) où l'appareil cible de commande est défini et ne chevauche pas la zone de vérification d'exécution de commande à distance, l'appareil cible de commande, selon la présence ou l'absence d'une réponse au message de vérification d'exécution de commande en provenance dudit un autre terminal portable, et selon le contenu de la réponse.

FIG.1

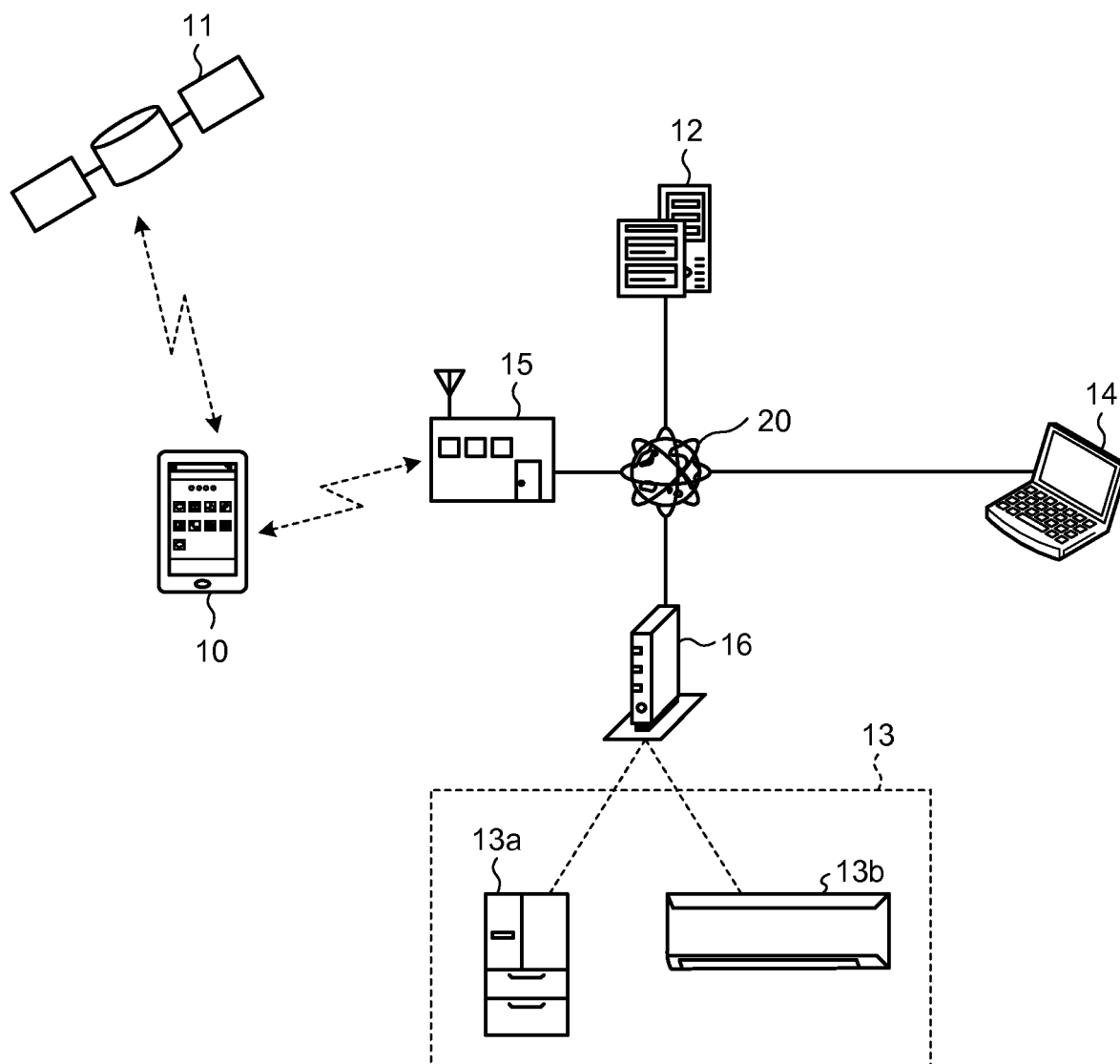


FIG.2

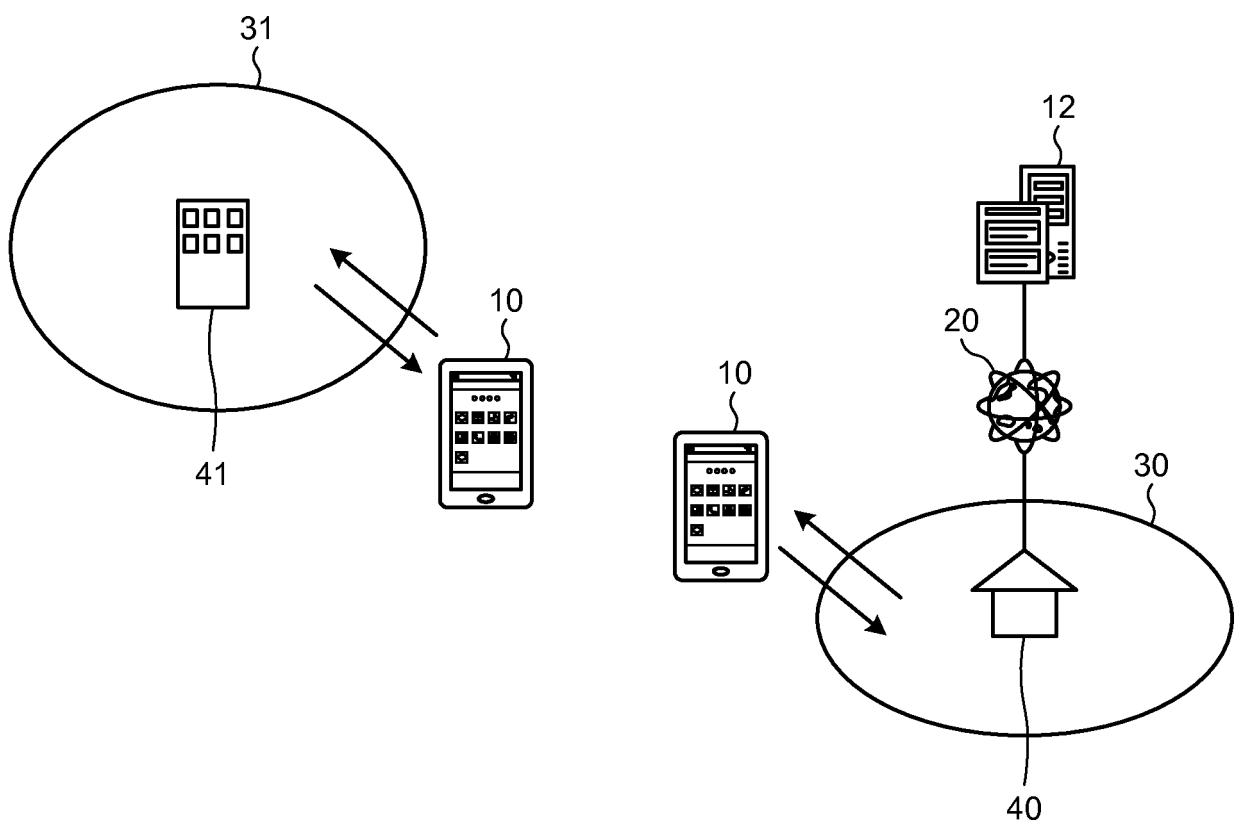


FIG.3

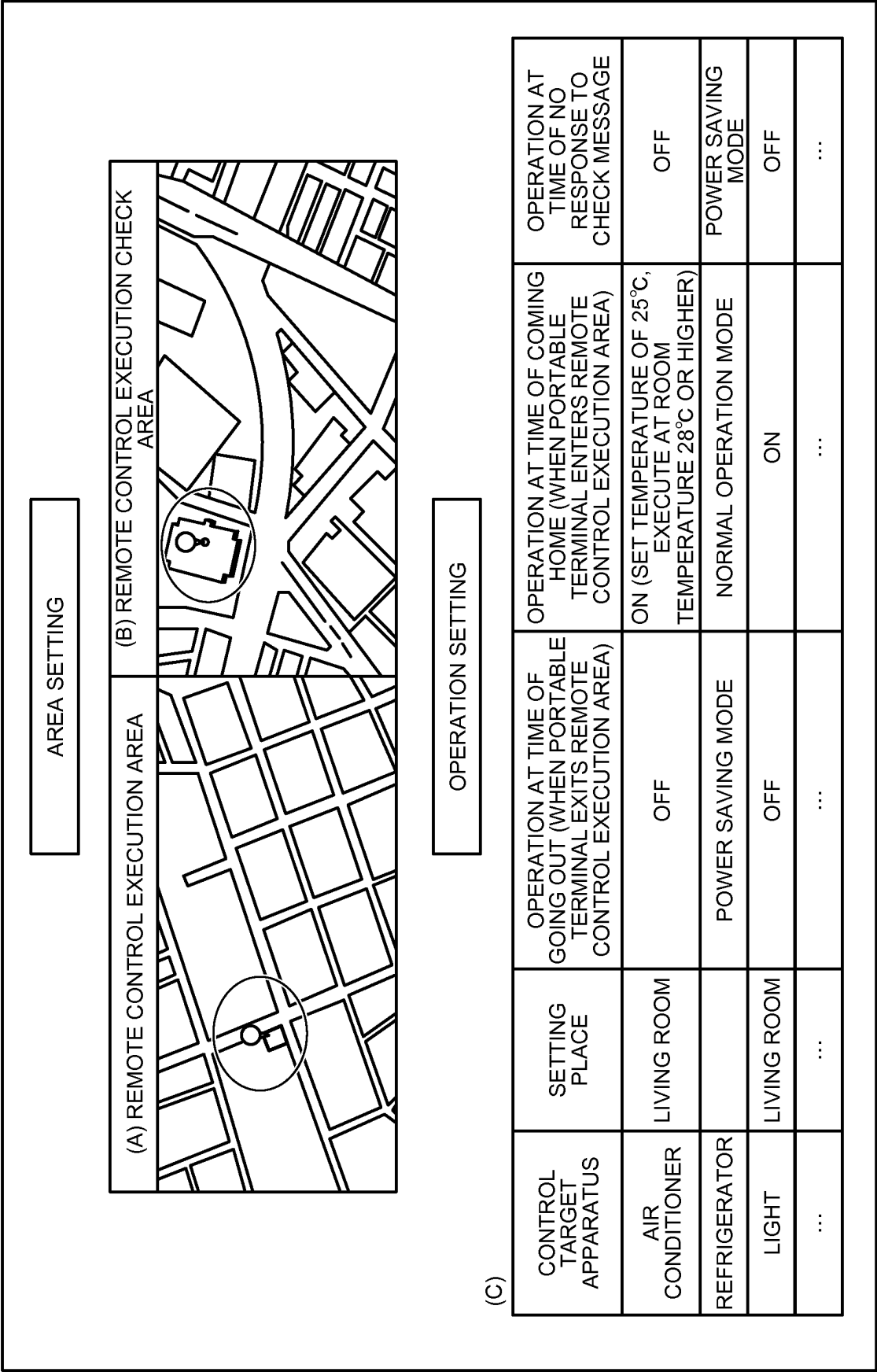


FIG.4

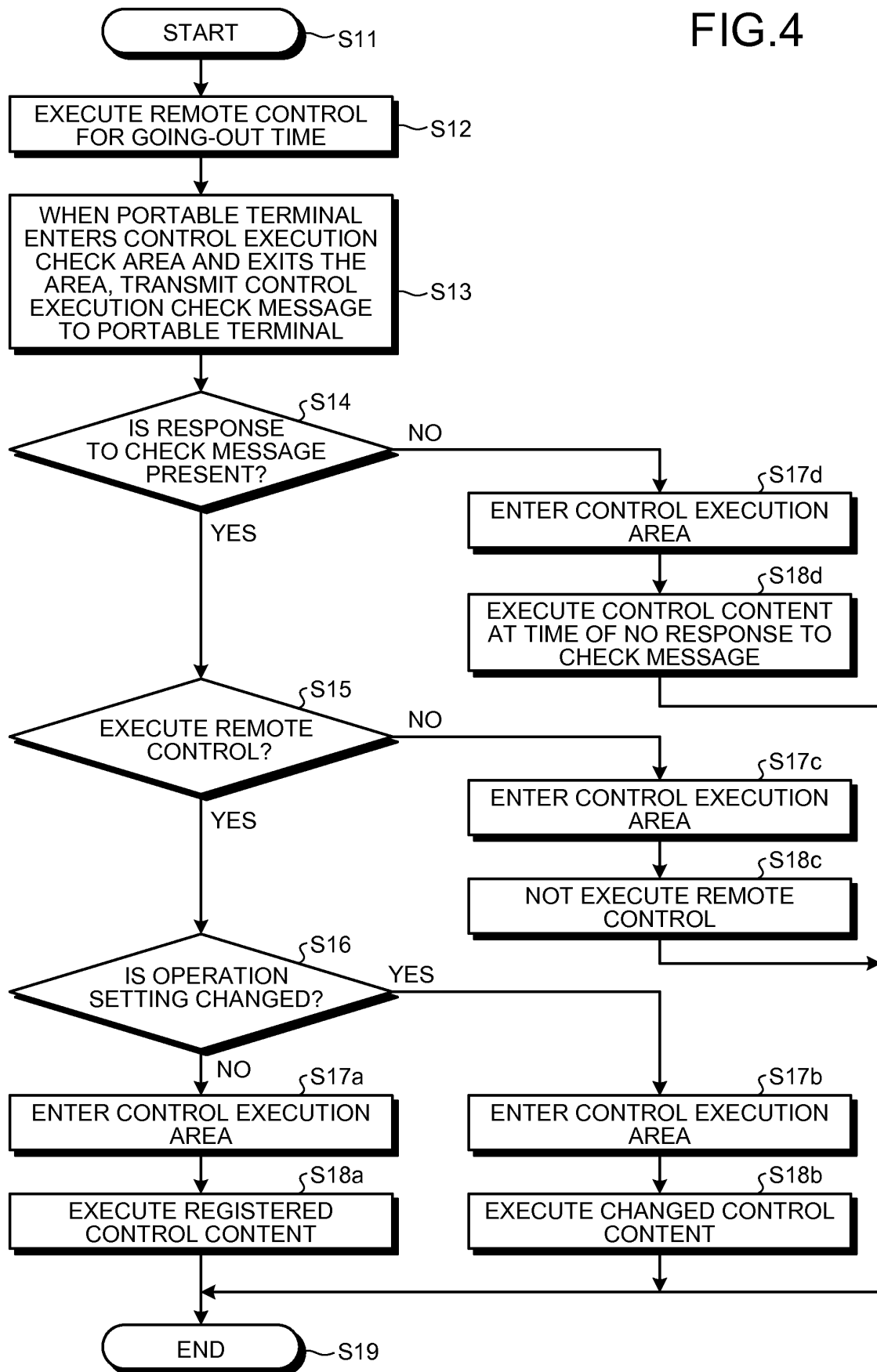


FIG.5

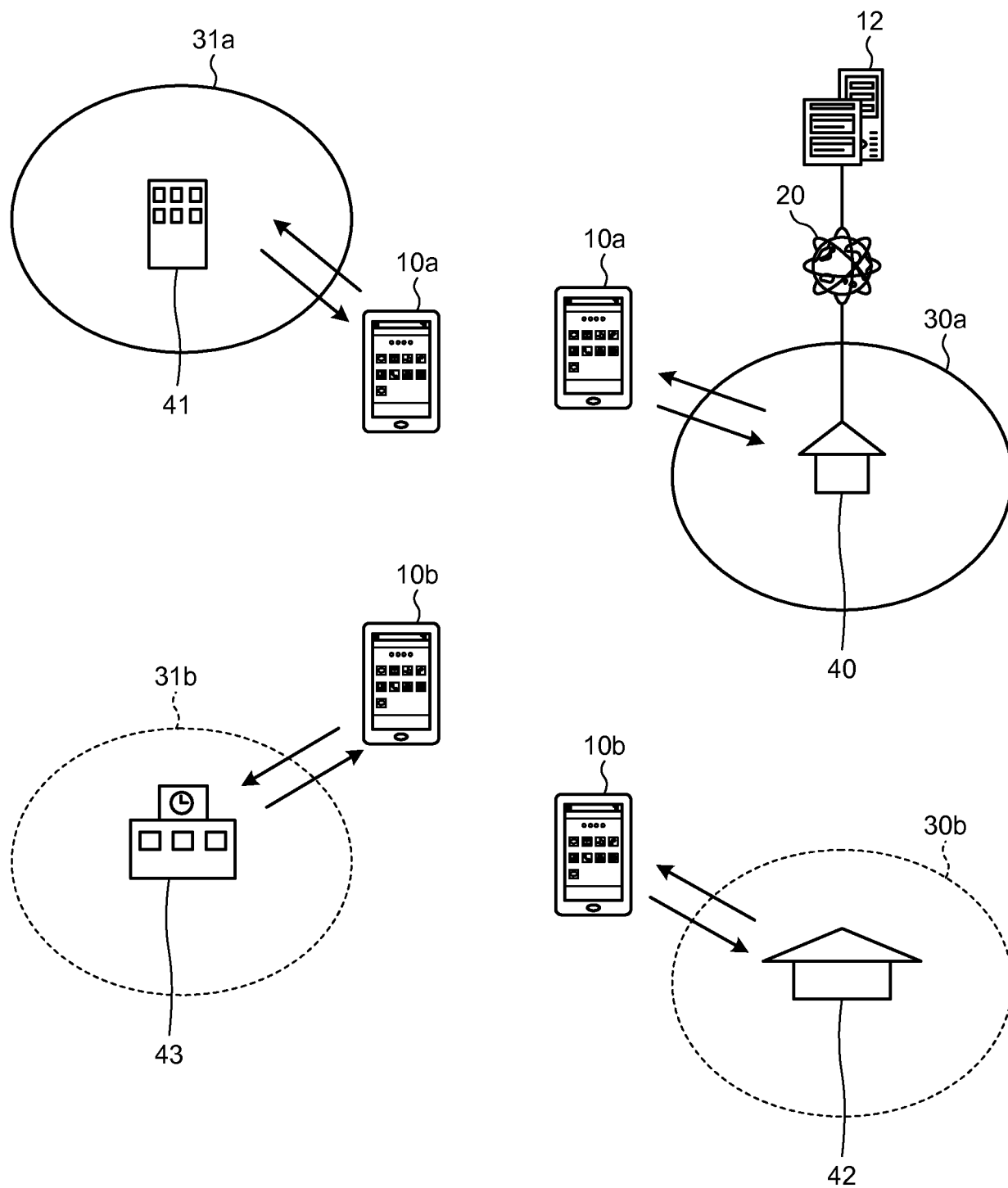


FIG.6

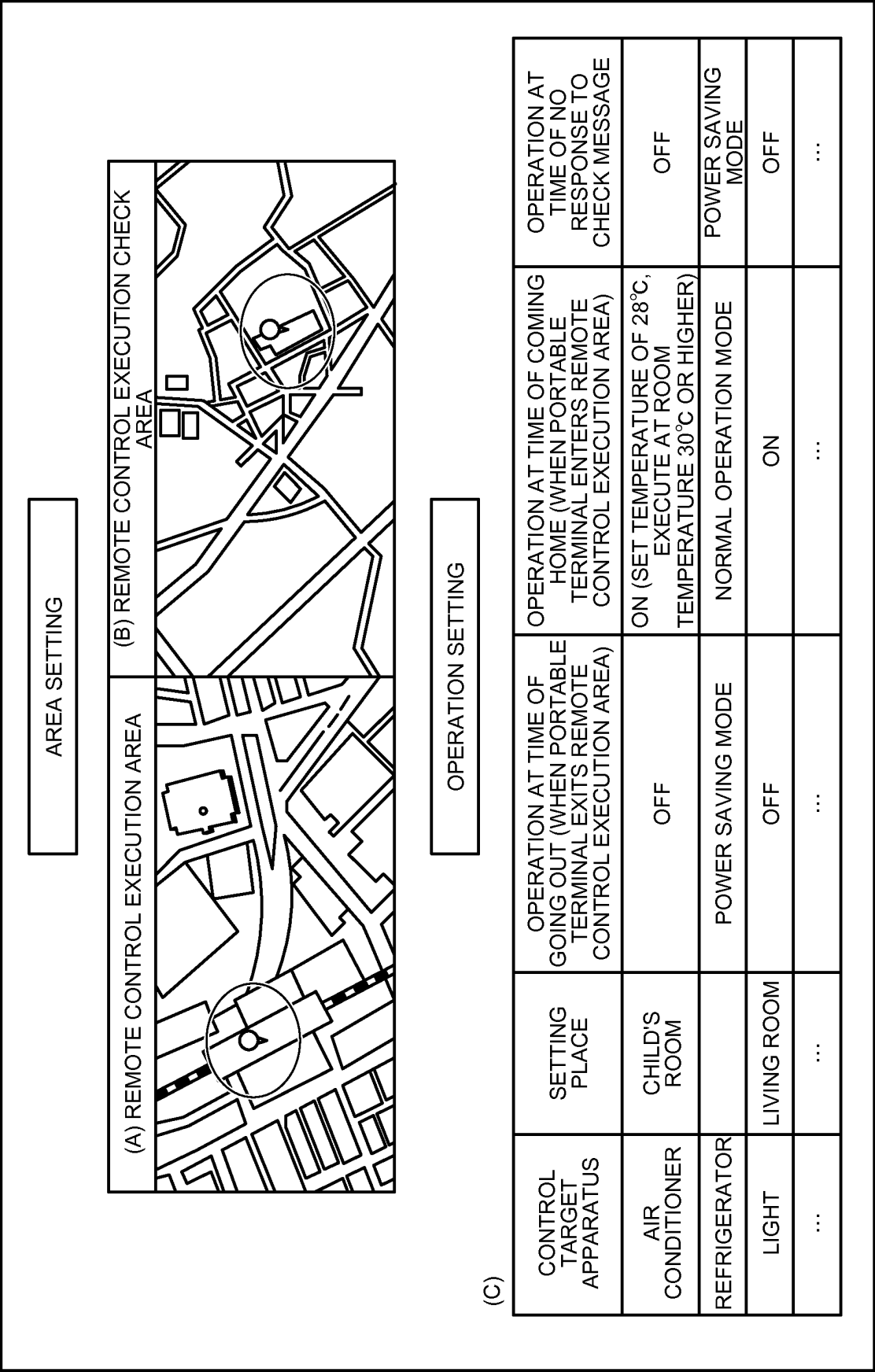
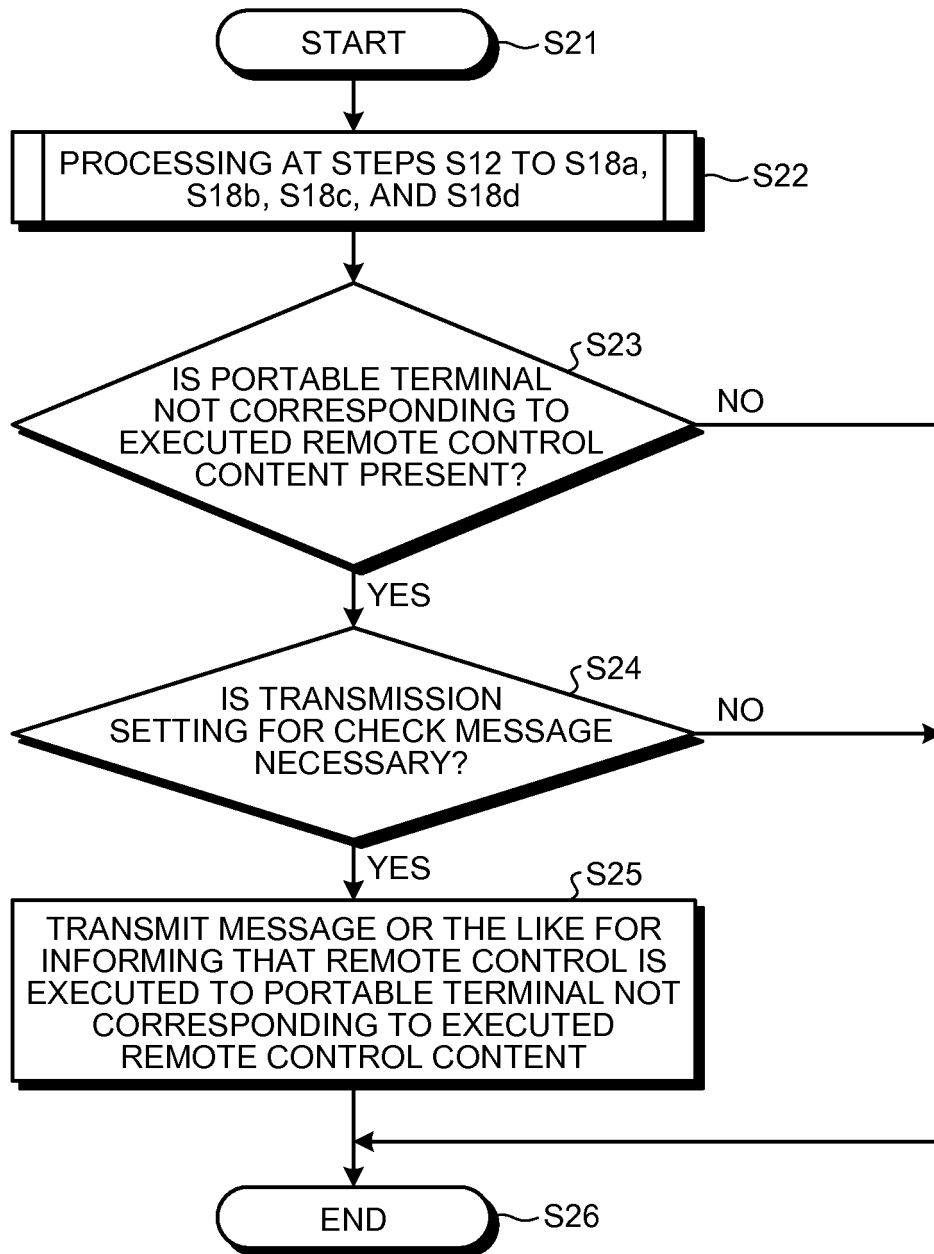


FIG.7



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 2005175776 A [0003]
- JP 2003304342 A [0004]
- JP 2001238274 A [0004]