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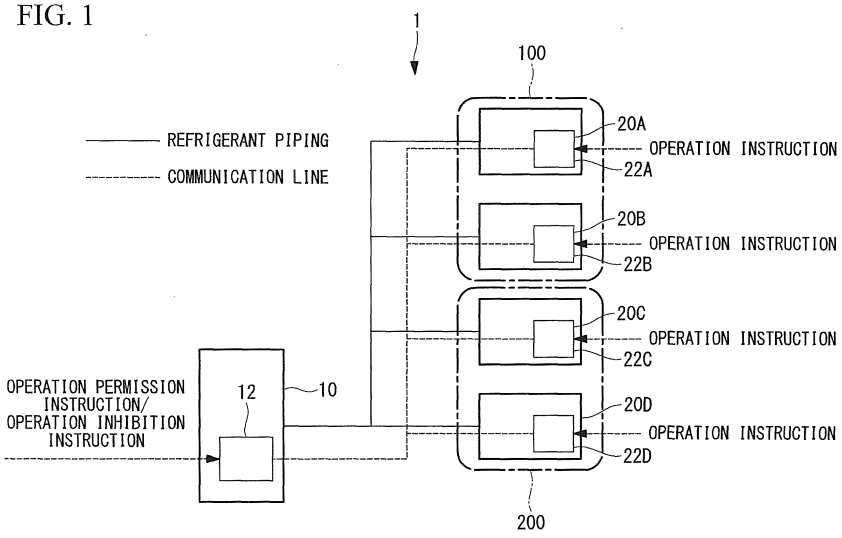
(54) AIR-CONDITIONING SYSTEM AND METHOD FOR CONTROLLING AIR-CONDITIONING SYSTEM

(57) An air conditioning system having a high degree of freedom and a method for controlling the air conditioning system is provided. An air conditioning system (1) includes a plurality of indoor units (20), an outdoor unit (10) connected to each of the indoor units (20), indoor unit control devices (22) that respectively control the indoor units (20), an outdoor unit control device (12) that controls the outdoor unit (10) and each of the indoor units (20), and operating or stopping all the indoor units (20) by inputting an operation permission instruction or an operation inhibition instruction to the outdoor unit control device (12), the air conditioning system (1) further including a storage section that stores operation stop information on each of the indoor units immediately before the operation inhibition instruction is input, in which the outdoor unit control device (12) resumes respective operations of all the indoor units (20) based on the operation stop information stored in the storage section when the operation permission instruction is input thereto.

FIG. 1



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Description

{Technical Field}

[0001] The present invention relates to an air conditioning system and a method for controlling the air conditioning system, and more specifically to an air conditioning system in which operations and stops are collectively managed using an outdoor unit and a method for controlling the air conditioning system.

{Background Art}

[0002] A multi-type air conditioning system in which a plurality of indoor units are connected to one outdoor unit has been known. Conventionally, control in such a multi-type air conditioning system has involved only monitoring of operation information and stop information on the indoor units and the outdoor unit. However, a behavior of the air conditioning system when external forced stop and forced operation instructions are issued has been examined. For example, PTL 1, described below, discloses that an operation is automatically resumed based on an operation content stored in a storage device at the time of restoration of power at the occurrence of a power failure.

{Citation List}

{Patent Literature}

[0003] {PTL 1} Japanese Unexamined Patent Application, Publication No. 2001-241740

{Summary of Invention}

{Technical Problem}

[0004] However, in the invention disclosed in PTL 1 described above, control of an air conditioning system is limited to a case where power has been disconnected, for example, power has failed. Therefore, the air conditioning system is only returned to a state before the power failure, and has a low degree of freedom. A case where operation has been stopped at times other than the power disconnection has not been examined. Further, the return to the state before the power failure, for example, resumption of the operation of an indoor unit, which had been operated, after the power failure is not necessarily the correct operation in all cases because a failure or a fire can occur.

[0005] The respective needs of a manager and a user of the air conditioning system are diversified, and cannot be handled under uniformed control. Therefore, a system with a higher degree of freedom has been expected.

[0006] The present invention has been made in view of such circumstances, and is directed to providing an air conditioning system with a high degree of freedom and a method for controlling the air conditioning system.

{Solution to Problem}

[0007] According to a first aspect of the present invention, there is provided an air conditioning system, including a plurality of indoor units, an outdoor unit connected to each of the indoor units, indoor unit control devices that respectively control the indoor units, and an outdoor unit control device that controls the outdoor unit and each of the indoor units, operates or stops all the indoor units by inputting an operation permission instruction or an operation inhibition instruction to the outdoor unit control device, the air conditioning system further including a storage section that stores operation stop information on each of the indoor units immediately before the operation inhibition instruction is input, in which the outdoor unit control device resumes respective operations of all the indoor units based on the operation stop information stored in the storage section when the operation permission instruction is input thereto.

[0008] According to the above described aspect, all the indoor units are operated or stopped by inputting the operation permission instruction or the operation inhibition instruction to the outdoor unit control device, the storage section stores the operation stop information on each of the indoor units immediately before the operation inhibition instruction is input, and the outdoor unit control device resumes the respective operations of all the indoor units based on the stored operation stop information when the operation permission instruction is input thereto. Therefore, operability for a manager is improved.

[0009] All the indoor units can be operated or stopped under control of the outdoor unit control device. Therefore, the respective operations and stops of the indoor units can be collectively managed, and the operation or the stop need not be controlled for each of the indoor units. Both the indoor units and the outdoor unit can be managed because they always remain powered on.

[0010] The storage sections respectively store the operation stop information on the indoor units immediately before the operation inhibition instruction is input, and the outdoor unit control device resumes, when the respective operations of all the indoor units are resumed, the operations based on the operation stop information. Therefore, the operation of the indoor unit, which had been operated before the stop, for example, is automatically resumed. Therefore, when the indoor unit is desired to be started every time the operation thereof is resumed, the corresponding indoor unit need not be manually started, and respective burdens on the manager and the user can be reduced.

[0011] In the above described aspect, the storage section may be provided in the outdoor unit control device.

[0012] According to the above described configuration, the storage section is provided in the outdoor unit control device. Accordingly, the storage section in the one outdoor unit control device stores the respective operation

stop information on all the indoor units connected to the outdoor unit. Therefore, the operation stop information can be managed in an integrated manner. A backup is easily acquired.

[0013] In the above described aspect, the storage section may be provided in the indoor unit control device.

[0014] According to the above described configuration, the storage sections are respectively provided in the indoor unit control devices. Accordingly, the storage sections in the indoor unit control devices respectively store the operation stop information. Therefore, the operation stop information can be distribution-managed, and a risk of a failure can also be dispersed.

[0015] In the above described aspect, the indoor unit may be controlled by a remote controller control device provided in a remote controller, and the storage section may be provided in the remote controller control device.

[0016] According to the above described configuration, the storage section in the remote controller control device stores the operation stop information on each of the indoor units immediately before the operation inhibition instruction is input, and the outdoor unit control device resumes the operation of each of the indoor units based on the stored operation stop information when the operation permission instruction is input thereto. Therefore, the storage capacity of the storage section in the outdoor unit control device is not increased, and a configuration of the outdoor unit control device need not be changed even if the number of the indoor units increases relative to the outdoor unit.

[0017] The operation stop information is stored in the remote controller control device. Therefore, the user can confirm the operation stop information with the remote controller at hand.

[0018] In the above described aspect, the storage section may be further provided in each of the indoor unit control devices, and the storage sections provided in the indoor unit control devices may respectively store information on operation settings such as set temperatures and air volumes of the indoor units.

[0019] According to the above described configuration, the storage sections in the indoor unit control devices respectively store the information on operation settings such as the set temperatures and the air volumes of the indoor units. Therefore, the storage capacity of the storage section in the outdoor unit control device is not increased, and a configuration of the outdoor unit control device need not be changed even if the number of the indoor units increases relative to the outdoor unit.

[0020] The storage sections in the indoor unit control devices respectively store the operation setting information. Therefore, the operation setting information can be distribution-managed, and a risk of a failure can also be dispersed.

[0021] In the above described aspect, the storage section may be further provided in each of the remote controller control devices, and the storage sections provided in the remote controller control devices may respectively store information on operation settings such as set temperatures and air volumes of the indoor units.

[0022] According to the above described configuration, the storage section in the remote controller control device stores the operation setting information on each of the indoor units. Therefore, the storage capacity of the storage section in the outdoor unit control device or the indoor unit control device is not increased.

[0023] The operation setting information is stored in the storage section in the remote controller control device. Therefore, the operation setting information need not be exchanged with the storage section in the outdoor unit control device, and the user can instantaneously confirm the operation setting information with the remote controller at hand.

[0024] In the above described aspect, the storage section may store the information on operation settings such as the set temperature and the air volume of each of the indoor units.

[0025] According to the above described configuration, the storage section stores the operation stop information and the operation setting information on each of the indoor units. Therefore, the one storage section can store the operation stop information and the operation setting information for each of the indoor units.

[0026] Particularly when the storage section is provided in the outdoor unit control device, the respective storage capacities of the storage sections in the indoor unit control device and the remote controller control device are not increased. The storage section in the outdoor unit control device collectively manages all information. Therefore, when control is performed based on the stored information, the information need not be exchanged between the outdoor unit and the indoor units, and an error in the exchange of the information need not be considered.

[0027] In the above described aspect, the storage section may enable the operation setting information to be overwritten while the indoor unit is stopped.

[0028] In the above described configuration, the storage section enables the operation setting information to be overwritten while the indoor unit is stopped. Therefore, even if the operation of the indoor unit is stopped, the operation setting information can be changed. Thus, when the operation setting information is changed during the stop, the operation can be automatically resumed at a temperature and an air volume desired by the user, and the respective degrees of freedom for operations by the manager and the user are improved.

[0029] In the above described aspect, the plurality of indoor units may include a first indoor unit group including one or a plurality of indoor units, and a second indoor unit group including one or a plurality of indoor units other than the first indoor unit group, in which the storage section may store the operation stop information on each of the indoor units in the first indoor unit group immediately before the operation inhibition instruction is input, and may not store the operation stop information on each of

the indoor units in the second indoor unit group, and the operation of each of the indoor units in the first indoor unit group may be resumed based on the stored operation stop information on the indoor unit in the first indoor unit group when the operation permission instruction is input, and each of the indoor units in the second indoor unit group may remain stopped.

[0030] According to the above described configuration, the storage section stores the operation stop information on each of the indoor units in the first indoor unit group immediately before the operation inhibition instruction is input, and does not store the operation stop information on each of the indoor units in the second indoor unit group. When the operation permission instruction is input, the operation is resumed based on the operation stop information on each of the indoor units in the first indoor unit group, and each of the indoor units in the second indoor unit group remains stopped. Therefore, it can be set for each of the groups whether the operation stop information is stored. Accordingly, the corresponding indoor unit can also remain stopped when the operation thereof is resumed regardless of the operation stop information immediately before the operation inhibition instruction is input.

[0031] When the indoor unit often remains stopped, like in a meeting room, for example, even if the indoor unit has been operated immediately before the operation inhibition instruction is input, the indoor unit remains automatically stopped when the operation is then resumed. Therefore, it is possible to prevent the indoor unit from being left turned on.

[0032] According to a second aspect of the present invention, there is provided a method for controlling an air conditioning system, comprising a plurality of indoor units, an outdoor unit connected to each of the indoor units, indoor unit control devices that respectively control the indoor units, and an outdoor unit control device that controls the outdoor unit and each of the indoor units, the method comprising the step of operating or stopping all the indoor units by inputting an operation permission instruction or an operation inhibition instruction to the outdoor unit control device, and the step in which the air conditioning system further includes a storage section that stores operation stop information on each of the indoor units immediately before the operation inhibition instruction is input, and the outdoor unit control device resumes the respective operations of all the indoor units based on the operation stop information stored in the storage sections when the operation permission instruction is input thereto.

[0033] According to the above described aspect, all the indoor units are operated or stopped by inputting the operation permission instruction or the operation inhibition instruction to the outdoor unit control device, the storage section stores the operation stop information on each of the indoor units immediately before the operation inhibition instruction is input, and the outdoor unit control device resumes the respective operations of all the indoor units based on the stored operation stop information when the operation permission instruction is input thereto. Therefore, operability for a manager is improved.

[0034] All the indoor units can be operated or stopped under control of the outdoor unit control device. Therefore, the respective operations and stops of the indoor units can be collectively managed, and the operation or the stop need not be controlled for each of the indoor units. Both the indoor units and the outdoor unit can be managed because they always remain powered on.

[0035] The storage sections respectively store the operation stop information on the indoor units immediately before the operation inhibition instruction is input, and the outdoor unit control device resumes, when the respective operations of all the indoor units are resumed, the operations based on the operation stop information. Therefore, the operation of the indoor unit, which had been operated before the stop, for example, is automatically resumed. Therefore, when the indoor unit is desired to be started every time the operation is resumed, the corresponding indoor unit need not be manually started, and respective burdens on the manager and the user can be reduced.

{Advantageous Effects of Invention}

[0036] According to the present invention, an operation is automatically resumed based on information before the operation is stopped when resumed. Thus, respective burdens on a manager and a user can be reduced.

{Brief Description of Drawings}

[0037]

{Fig. 1}
Fig. 1 is a schematic configuration diagram illustrating an air conditioner according to first, second, and fourth embodiments.

{Fig. 2A}
Fig. 2A is a flowchart illustrating control performed when an operation inhibition instruction of the air conditioner according to the first embodiment of the present invention is input.

{Fig. 2B}
Fig. 2B is a flowchart illustrating control performed when the operation inhibition instruction of the air conditioner according to the first embodiment of the present invention is input.

{Fig. 3A}
Fig. 3A is a flowchart illustrating control performed when an operation inhibition instruction of the air conditioner according to the second embodiment of the present invention is input.

{Fig. 3B}
Fig. 3B is a flowchart illustrating control performed when the operation inhibition instruction of the air conditioner according to the second embodiment of

the present invention is input.

{Fig. 4}

Fig. 4 is a schematic configuration diagram illustrating an air conditioner according to a modification to the second embodiment and a third embodiment of the present invention.

{Fig. 5A}

Fig. 5A is a flowchart illustrating control performed when an operation inhibition instruction of the air conditioner according to the modification to the second embodiment of the present invention is input.

{Fig. 5B}

Fig. 5B is a flowchart illustrating control performed when the operation inhibition instruction of the air conditioner according to the modification to the second embodiment of the present invention is input.

{Fig. 6A}

Fig. 6A is a flowchart illustrating control performed when an operation inhibition instruction of the air conditioner according to the third embodiment of the present invention is input.

{Fig. 6B}

Fig. 6B is a flowchart illustrating control performed when the operation inhibition instruction of the air conditioner according to the third embodiment of the present invention is input.

{Fig. 7A}

Fig. 7A is a flowchart illustrating control performed when an operation inhibition instruction of an air conditioner according to a fourth embodiment of the present invention is input.

{Fig. 7B}

Fig. 7B is a flowchart illustrating control performed when the operation inhibition instruction of the air conditioner according to the fourth embodiment of the present invention is input.

{Description of Embodiments}

[0038] An embodiment of an air conditioning system according to the present invention and a method for controlling the air conditioning system will be described below with reference to the drawings.

(First Embodiment)

[0039] A first embodiment of the present invention will be described below with reference to Fig. 1.

[0040] Fig. 1 illustrates a schematic configuration of an air conditioning system according to the present embodiment and a method for controlling the air conditioning system.

[0041] As illustrated in Fig. 1, an air conditioner (air conditioning system) 1 mainly includes one outdoor unit 10 and a plurality of (four in the present embodiment) indoor units 20.

[0042] The outdoor unit 10 and each of the indoor units 20 are connected to each other via refrigerant piping.

[0043] An outdoor unit control device 12 is provided in the outdoor unit 10. On the other hand, an indoor unit control device 22 is provided in the indoor unit 20. The outdoor unit control device 12 and the indoor unit control device 22 are connected to each other via a communication line. The outdoor unit control device 12 and each of the indoor unit control devices 22 respectively have storage sections (not illustrated) storing various types of information therein.

[0044] In the following description, each of the indoor units 20 and each of the indoor unit control devices 22 are respectively assigned with any one of A to D at their respective ends when the indoor units 20 and the indoor unit control devices 22 are respectively distinguished from one another, and the assignment of A to D is omitted when not distinguished from one another.

[0045] The indoor units 20 are classified depending on their respective installation locations and uses, for example. In the present embodiment, an indoor unit 20A and an indoor unit 20B are classified into a first indoor unit group 100, and an indoor unit 20C and an indoor unit 20D are classified into a second indoor unit group 200. Further, the first indoor unit group 100 is a shared space such as an office room, and the second indoor unit group 200 is an individual space such as a meeting room.

[0046] The entire system of the air conditioner 1 is operated or stopped by input of an operation permission instruction or an operation inhibition instruction from a manager to the outdoor unit control device 12 in the outdoor unit 10.

[0047] The outdoor unit 10 and each of the indoor units 20 always remain powered on, and are operated or stopped when the operation permission instruction or the operation inhibition instruction is input.

[0048] The indoor units 20 can be respectively independently operated. As to how the indoor units are operated, control is performed when an operation instruction issued by a user is input to the respective indoor unit control devices 22. Examples of the operation instruction issued by the user include an instruction to operate and stop the indoor unit 20 and an instruction to change a temperature, an air volume, and an operation type (cooling, heating, etc.).

[0049] When the operation inhibition instruction is input to the outdoor unit control device 12 with the air conditioner 1 being operated, all devices in the air conditioner 1, including the indoor unit 20 that has been being operated, are stopped. Since the operation inhibition instruction has been input, the indoor unit 20 is not operated even if the operation instruction is input to the indoor unit 20. When the operation permission instruction is input to the outdoor unit control device 12 with all the devices stopped, each of the indoor units 20 enters an operable state. When the operation inhibition instruction is input to the outdoor unit control device 12, however, information indicating whether the operation has been performed is reset so that all the devices remain stopped.

[0050] However, the fact that the information indicating

whether or not the operation has been performed is thus always reset does not necessarily meet the needs of the manager and the user. When the operation permission instruction is input to the outdoor unit 10, predetermined indoor unit 20 always starts to operate, for example, and therefore, the manager need not go around inputting the operation instruction to each of the indoor units 20, and the user need not input the operation instruction each time.

[0051] In the present embodiment, the state of each of the indoor units 20 immediately before the input of the operation inhibition instruction is stored, and the operation of each of the indoor units 20 is resumed in the stored state of the indoor unit 20 when the operation permission instruction is input.

[0052] Figs. 2A and 2B are respectively flowcharts illustrating control performed when an operation inhibition instruction of the air conditioner according to the present embodiment is input.

[0053] First, the air conditioner 1 is being operated.

[0054] In the air conditioner 1 that is being operated, the operation inhibition instruction is input to the outdoor unit control device 12 by external input from the manager (step S201).

[0055] When the operation inhibition instruction is input, it is determined whether the outdoor unit control device 12 stores operation stop information on all the indoor units 20 or stores operation stop information on the indoor units 20 in only some of the indoor unit groups (step S202). The operation stop information is information indicating whether the corresponding indoor unit 20 remains either operated or stopped. The manager previously sets in the outdoor unit control device 12 whether the operation stop information on all the indoor units 20 are stored or the operation stop information on the indoor units 20 in only some of the indoor unit groups are stored.

[0056] If it is determined that the outdoor unit control device 12 stores the operation stop information on all the indoor units 20 in step S202, described above, the operation stop information on all the indoor units 20 are stored in the outdoor unit control device 12 (step S203). If it is determined that the operation stop information on the indoor units 20 in only some of the indoor unit groups are stored in step S202, described above, the operation stop information on the indoor units in the corresponding indoor unit group, i.e., the indoor unit 20A and the indoor unit 20B in the first indoor unit group 100 in the present embodiment are stored in the outdoor unit control device 12, and the operation stop information on the indoor units in the second indoor unit group 200 are not stored (step S204).

[0057] Then, the operation setting information on the indoor units 20 are respectively stored in the indoor unit control devices 22 (step S205). The operation setting information is information indicating a temperature, an air volume, and an operation type (cooling, heating, etc.) set in the corresponding indoor unit 20.

[0058] After control from steps S202 to step S205, described above, is performed, all the devices in the air conditioner 1 are stopped based on the operation inhibition instruction (step S206).

[0059] It is determined whether or not an operation permission instruction has been input to the outdoor unit control device 12 by external input from the manager (step S207). If the operation permission instruction has been input, the operations of all the indoor units 20 are respectively resumed based on the operation stop information on the indoor units 20 stored in step S203 or step S204 and the operation setting information on the indoor units 20 stored in step S205 or step S210 described below (step S211). If the stored operation stop information on the indoor unit 20 is "stop", the corresponding indoor unit 20 remains stopped. If all the indoor units 20 remain stopped, the outdoor unit 10 also remains stopped.

[0060] A user may change the operation setting information on the indoor unit 20 while all the devices in the air conditioner 1 are stopped. For example, a cooling temperature may be made lower and an air volume may be made larger than when the operation is stopped to previously arrange an environment of a room, for example. On the other hand, the manager previously sets in each of the indoor unit control devices 22 whether or not the operation setting information on the indoor unit 20 is permitted to be changed while all the devices in the air conditioner 1 are stopped.

[0061] If all the devices in the air conditioner 1 are stopped (step S206), until the operation permission instruction is input (NO in step S207), it is determined whether or not the operation setting information on the indoor unit 20 is changed (step S208). If it is determined that the operation setting information on the indoor unit 20 is not changed, the processing returns to step S207. If it is determined that the operation setting information on the indoor unit 20 is changed in step S208, it is determined whether or not the operation setting information on the indoor unit 20 has been changed (step S209). If it is determined that the operation setting information on the indoor unit 20 has not been changed, the processing returns to step S207. If it is determined that the operation setting information on the indoor unit 20 has been changed in step S209, the stored operation setting information on the corresponding indoor unit 20 is changed, i.e., overwritten (step S210). This is repeated until the operation permission instruction is input. When the operation permission instruction is input (YES in step S207), the last operation setting information is reflected when the operation is resumed.

[0062] Thus, the operation setting information can be changed a plurality of times while all the devices in the air conditioner 1 are stopped. Therefore, it is always monitored whether the operation setting information has been changed during the stop.

[0063] As described above, in the air conditioning system according to the present embodiment and the method for controlling the air conditioning system, all the indoor units 20 are operated or stopped by inputting the

operation permission instruction or the operation inhibition instruction to the outdoor unit control device 12, the storage section stores the operation stop information on each of the indoor units 20 immediately before the operation inhibition instruction is input, and the outdoor unit control device 12 resumes the respective operations of all the indoor units 20 based on the stored operation stop information when the operation permission instruction is input. Therefore, operability for the manager is improved.

[0064] All the indoor units 20 can be operated or stopped under control of the outdoor unit control device 12. Therefore, the respective operations and stops of the indoor units 20 can be collectively managed, and the operation or stop need not be controlled for each of the indoor units 20. Both the indoor unit 20 and the outdoor unit 10 can be managed because they always remain powered on.

[0065] The storage section stores the operation stop information on the indoor unit 20 immediately before the operation inhibition instruction is input, and the outdoor unit control device 12 resumes the operation based on the operation stop information when the respective operations of all the indoor units 20 are resumed. Therefore, the operation of the indoor unit 20, which had been operated before the stop, for example, is automatically resumed. Therefore, when the indoor unit 20 is desired to be started every time the operation thereof is resumed, the corresponding indoor unit 20 need not be manually started, and respective burdens on the manager and the user can be reduced.

[0066] When the storage section is provided in the outdoor unit control devices 12, the storage section in one outdoor unit control device 12 stores the respective operation stop information on all the indoor units 20 connected to the outdoor unit 10. Therefore, the operation stop information can be collectively managed. A backup is easily acquired.

[0067] The storage sections in the indoor unit control devices 22 respectively store the operation setting information such as the setting temperatures and the air volumes of the indoor units 20. Therefore, the storage capacity of the storage section in the outdoor unit control device 12 is not increased. Even if the number of the indoor units 20 increases relative to the outdoor unit 10, a configuration of the outdoor unit control device 12 need not be changed.

[0068] The respective storage sections in the indoor unit control devices 22 store the operation setting information. Therefore, the operation setting information can be distribution-managed, and a risk of a failure can also be dispersed.

[0069] The storage section enables the operation setting information to be overwritten while the indoor unit 20 is stopped. Therefore, the operation setting information can be changed even while the operation of the indoor unit 20 is stopped. Therefore, when the operation setting information is changed during the stop, the operation can be automatically resumed at a temperature and an air volume desired by the user, and the respective degrees of freedom for operations by the manager and the user are improved.

[0070] The storage section stores the operation stop information on each of the indoor units 20 in the first indoor unit group 100 immediately before the operation inhibition instruction is input, and does not store the operation stop information on each of the indoor units 20 in the second indoor unit group 200. When the operation permission instruction is input, the operation is resumed based on the operation stop information on the indoor units in the first indoor unit group 100, and each of the indoor units 20 in the second indoor unit group 200 remains stopped. Therefore, it can be set for each of the groups whether or not the operation stop information is stored. Accordingly, the corresponding indoor unit 20 can also remain stopped when the operation thereof is resumed regardless of the operation stop information immediately before the operation inhibition instruction is input.

[0071] When the indoor unit 20 often remains stopped, like in a meeting room, for example, even if the indoor unit 20 has been operated immediately before the operation inhibition instruction is input, the indoor unit 20 remains automatically stopped when the operation is then resumed. Therefore, it is possible to prevent the indoor unit 20 from being left turned on.

(Second Embodiment)

[0072] A second embodiment of the present invention will be described below with reference to Fig. 1 and Figs. 3A and 3B.

[0073] While the operation stop information is stored in the outdoor unit control device in the above described first embodiment, operation stop information is stored in each of indoor unit control devices in the present embodiment. Other points are similar to those in the first embodiment, and hence description thereof is omitted.

[0074] Fig. 1 illustrates a schematic configuration of an air conditioning system according to the present embodiment and a method for controlling the air conditioning system.

[0075] Figs. 3A and 3B are respectively flowcharts illustrating control performed when an operation inhibition instruction of an air conditioner according to the present embodiment is input.

[0076] First, an air conditioner 1 is being operated.

[0077] In the air conditioner 1 that is being operated, the operation inhibition instruction is input to an outdoor unit control device 12 by external input from a manager (step S301).

[0078] When the operation inhibition instruction is input, it is determined whether indoor unit control devices 22 respectively store operation stop information on all indoor units 20 or store operation stop information on the indoor units 20 in only some of indoor unit groups (step S302). The manager previously sets in the indoor unit

control devices 22, respectively, whether the operation stop information on all the indoor units 20 are stored or the operation stop information on the indoor units 20 in only some of indoor unit groups are stored.

[0079] If it is determined that the indoor unit control devices 22 respectively store the operation stop information on all the indoor units 20 in step S302, described above, the operation stop information on all the indoor units 20 are respectively stored in the indoor unit control devices 22 (step S303). If it is determined that the operation stop information on the indoor units 20 in only some of the indoor unit groups are stored in step S302, described above, the operation stop information on the indoor units in the corresponding indoor unit group, i.e., an indoor unit 20A and an indoor unit 20B in a first indoor unit group 100 in the present embodiment are respectively stored in an indoor unit control device 22A and an indoor unit control device 22B, and the operation stop information on the indoor units in a second indoor unit group 200 are not stored (step S304).

[0080] Then, the operation setting information on the indoor units 20 are respectively stored in the indoor unit control device 22 (step S305).

[0081] After control from step S302 to step S305, described above, is performed, all devices in the air conditioner 1 are stopped based on the operation inhibition instruction (step S306).

[0082] It is determined whether or not the operation permission instruction has been input to the outdoor unit control device 12 by external input from the manager (step S307). If the operation permission instruction has been input, the respective operations of all the indoor units 20 are resumed based on the operation stop information on the indoor units 20 stored in step S303 or S304 and the operation setting information on the indoor units 20 stored in step S305 or step S310 described below (step S311).

[0083] The user may change the operation setting information on the indoor unit 20 while all the devices in the air conditioner 1 are stopped. For example, a cooling temperature may be made lower and an air volume may be made larger than when the operation has been stopped to previously arrange an environment of a room. On the other hand, the manager previously sets in each of the indoor unit control devices 22 whether or not the operation setting information on the indoor unit 20 is permitted to be changed while all the devices in the air conditioner 1 are stopped.

[0084] If all the devices in the air conditioner 1 are stopped (step S306), until the operation permission instruction is input (NO in step S307), it is determined whether or not the operation setting information on the indoor unit 20 is changed (step S308). If it is determined that the operation setting information is not changed, the processing returns to step S307. If it is determined that the operation setting information is changed in step S308, it is determined whether or not the operation setting information on the indoor unit 20 has been changed (step S309). If it is determined that the operation setting information has not been changed, the processing returns to step S307. If it is determined that the operation setting information has been changed in step S309, the stored operation setting information on the corresponding indoor unit 20 is changed, i.e., overwritten (step S310). This is repeated until the operation permission instruction is input. If the operation permission instruction is input (YES in step S307), the last operation setting information is reflected when the operation is resumed.

[0085] Thus, the operation setting information can be changed a plurality of times while all the devices in the air conditioner 1 are stopped. Therefore, it is always monitored whether the operation setting information has been changed during the stop.

[0086] As described above, in the air conditioning system according to the present embodiment and the method for controlling the air conditioning system, all the indoor units 20 are operated or stopped by inputting the operation permission instruction or the operation inhibition instruction to the outdoor unit control device 12, the storage section stores the operation stop information on each of the indoor units 20 immediately before the operation inhibition instruction is input, and the outdoor unit control device 12 resumes the respective operations of all the indoor units 20 based on the stored operation stop information when the operation permission instruction is input thereto. Therefore, operability for the manager is improved.

[0087] All the indoor units 20 can be operated or stopped under control of the outdoor unit control device 12. Therefore, the respective operations and stops of the indoor units 20 can be collectively managed, and the operation or stop need not be controlled for each of the indoor units 20. Both the indoor unit 20 and the outdoor unit 10 can be managed because they always remain powered on.

[0088] The storage section stores the operation stop information on the indoor unit 20 immediately before the operation inhibition instruction is input, and the outdoor unit control device 12 resumes the operation based on the operation stop information when the operations of all the indoor units 20 are resumed. Therefore, the operation of the indoor unit 20, which had been operated before the stop, for example, is automatically resumed. Therefore, when the indoor unit 20 is desired to be started every time the operation thereof is resumed, the corresponding indoor unit 20 need not be manually started, and respective burdens on the manager and the user can be reduced.

[0089] When the storage sections are respectively provided in the indoor unit control devices 22, the storage sections in the indoor unit control devices 22 respectively store the operation stop information. Therefore, the operation stop information can be distribution-managed, and a risk of a failure can also be dispersed.

[0090] The storage section in each of the indoor unit control devices 22 stores the operation stop information

and the operation setting information on the corresponding indoor unit 20. Therefore, the one storage section can store the operation stop information and the operation setting information for each of the indoor units 20.

(Modification to Second Embodiment)

[0091] A modification to the second embodiment of the present invention will be described below with reference to Fig. 4 and Figs. 5A and 5B.

[0092] While the operation stop information and the operation setting information are stored in each of the indoor unit control devices in the above described second embodiment, operation stop information and operation setting information are stored in each of remote controller control devices in the modification. Other points are similar to those in the second embodiment, and hence description thereof is omitted.

[0093] Fig. 4 illustrates a schematic configuration of an air conditioning system according to the modification and a method for controlling the air conditioning system.

[0094] A remote controller control device 32 is provided in a remote controller 30, and an indoor unit control device 22 in an indoor unit 20 and the remote controller control device 32 are connected to each other via a communication line. The remote controller control device 32 has a storage section (not illustrated) storing various types of information therein.

[0095] The remote controller 30 is means for transmitting an operation instruction issued by a user to the indoor unit 20. When the operation instruction is input to the remote controller control device 32, the operation instruction is transmitted to the indoor unit control device 22. Examples of the operation instruction issued by the user include an operation and a stop, a temperature, an air volume, and an operation type (cooling, heating, etc.) of the indoor unit 20.

[0096] In the following description, each of the remote controllers 30 and each of the remote controller control devices 32 are respectively assigned with any one of A to D at their respective ends when the remote controllers 30 and the remote controller control devices 32 are respectively distinguished from one another, and the assignment of A to D is omitted when not distinguished from one another.

[0097] Figs. 5A and 5B are respectively flowcharts illustrating control performed when an operation inhibition instruction of an air conditioner according to the modification is input.

[0098] First, the air conditioner 1 is being operated.

[0099] In the air conditioner 1 that is being operated, an operation inhibition instruction is input to an outdoor unit control device 12 by external input from a manager (step S501).

[0100] When the operation inhibition instruction is input, it is determined whether the remote controller control devices 32 respectively store operation stop information on all the indoor units 20 or store operation stop information on the indoor units 20 in only some of indoor unit groups (step S502). The manager previously sets in the remote controller control devices 32, respectively, whether the operation stop information on all the indoor units 20 are stored or the operation stop information on the indoor units 20 in only some of the indoor unit groups are stored.

[0101] If it is determined that the remote controller control devices 32 respectively store the operation stop information on all the indoor units 20 in step S502, described above, the operation stop information on all the indoor units 20 are respectively stored in the remote controller control devices 32 (step S503). If it is determined that the operation stop information on the indoor units 20 in only some of the indoor unit groups are stored in step S502 described above, the operation stop information on the indoor units in the corresponding indoor unit group, i.e., an indoor unit 20A and an indoor unit 20B in a first indoor unit group 100 in the present embodiment are respectively stored in a remote controller control device 32A and a remote controller control device 32B, and the operation stop information on the indoor units in a second indoor unit group 200 are not stored (step S504).

[0102] Then, operation setting information on the indoor units 20 are respectively stored in the remote controller control devices 32 (step S505).

[0103] After control from step S502 to step S505, described above, is performed, all devices in the air conditioner 1 are stopped based on the operation inhibition instruction (step S506).

[0104] It is determined whether or not an operation permission instruction has been input to the outdoor unit control device 12 by external input from the manager (step S507). If the operation permission instruction has been input, the operations of all the indoor units 20 are respectively resumed based on the operation stop information on the indoor units 20 stored in step S503 or S504 and the operation setting information on the indoor units 20 stored in step S505 or step S510 described below (step S511).

[0105] A user may change the operation setting information on the indoor unit 20 while all devices in the air conditioner 1 are stopped. For example, a cooling temperature may be made lower and an air volume may be made larger than when the operation is stopped to previously arrange an environment of a room, for example. On the other hand, the manager previously sets in each of the remote controller control devices 32 whether or not the operation setting information on the indoor unit 20 is permitted to be changed while all the devices in the air conditioner 1 are stopped.

[0106] If all the devices in the air conditioner 1 are stopped (step S506), until the operation permission instruction is input (NO in step S507), it is determined whether or not the operation setting information on the indoor unit 20 is changed (step S508). If it is determined that the operation setting information on the indoor unit 20 is not changed, the processing returns to step S507.

If it is determined that the operation setting information on the indoor unit 20 is changed in step S508, it is determined whether or not the operation setting information on the indoor unit 20 has been changed (step S509). If it is determined that the operation setting information on the indoor unit 20 has not been changed, the processing returns to step S507. If it is determined that the operation setting information on the indoor unit 20 has been changed in step S509, the stored operation setting information on the corresponding indoor unit 20 is changed, i.e., overwritten (step S510). This is repeated until the operation permission instruction is input. When the operation permission instruction is input (YES in step S507), the last operation setting information is reflected when the operation is resumed.

[0107] Thus, the operation setting information can be changed a plurality of times while all the devices in the air conditioner 1 are stopped. Therefore, it is always monitored whether the operation setting information has been changed during the stop.

[0108] As described above, in the air conditioning system according to the present embodiment and the method for controlling the air conditioning system, all the indoor units 20 are operated or stopped by inputting the operation permission instruction or the operation inhibition instruction to the outdoor unit control device 12, the storage section stores the operation stop information on each of the indoor units 20 immediately before the operation inhibition instruction is input, and the outdoor unit control device 12 resumes the respective operations of all the indoor units 20 based on the stored operation stop information when the operation permission instruction is input thereto. Therefore, operability for the manager is improved.

[0109] All the indoor units 20 can be operated or stopped under control of the outdoor unit control device 12. Therefore, the respective operations and stops of the indoor units 20 can be collectively managed, and the operation or stop need not be controlled for each of the indoor units 20. Both the indoor unit 20 and the outdoor unit 10 can be managed because they always remain powered on.

[0110] The storage section stores the operation stop information on the indoor unit 20 immediately before the operation inhibition instruction is input, and the outdoor unit control device 12 resumes the operation based on the operation stop information when the respective operations of all the indoor units 20 are resumed. Therefore, the operation of the indoor unit 20, which had been operated before the stop, for example, is automatically resumed. Therefore, when the indoor unit 20 is desired to be started every time the operation thereof is resumed, the corresponding indoor unit 20 need not be manually started, and respective burdens on the manager and the user can be reduced.

[0111] The storage section in the remote controller control device 32 stores the operation stop information on each of the indoor units 20 immediately before the operation inhibition instruction is input, and the outdoor unit control device 12 resumes the operation of each of the indoor units 20 based on the stored operation stop information when the operation permission instruction is input thereto. Therefore, the storage capacities of the storage sections in the outdoor unit control device 12 and the indoor unit control device 22 are not increased. Even if the number of the indoor units 20 increases relative to the outdoor unit 10, a configuration of the outdoor unit control device 12 need not be changed. The operation stop information and the operation setting information are stored in the remote controller control device 32. Therefore, the operation setting information need not be exchanged with the storage section in the outdoor unit control device 12, and the user can instantaneously confirm the operation stop information and the operation setting information with the remote controller 30 at hand.

[0112] The storage section in each of the remote controller control device 32 stores the operation stop information and the operation setting information on the corresponding indoor unit 20. Therefore, the one storage section can store the operation stop information and the operation setting information for each of the indoor units 20.

(Third Embodiment)

[0113] A third embodiment of the present invention will be described below with reference to Fig. 4 and Figs. 6A and 6B.

[0114] Fig. 4 illustrates a schematic configuration of an air conditioning system according to the present embodiment and a method for controlling the air conditioning system.

[0115] While the operation setting information is stored in each of the indoor unit control devices in the above described second embodiment, operation setting information is stored in each of remote controller control devices in the present embodiment. Other points are similar to those in the second embodiment, and hence description thereof is omitted.

[0116] Figs. 6A and 6B are respectively flowcharts illustrating control performed when an operation inhibition instruction of an air conditioner according to the present embodiment is input.

[0117] First, an air conditioner 1 is being operated.

[0118] In the air conditioner 1 that is being operated, the operation inhibition instruction is input to an outdoor unit control device 12 by external input from a manager (step S601).

[0119] When the operation inhibition instruction is input, it is determined whether indoor unit control devices 22 respectively store operation stop information on all indoor units 20 or respectively store the operation stop information on the indoor units 20 in only some of indoor unit groups (step S602). The manager previously sets in the indoor unit control devices 22, respectively, whether the operation stop information on all the indoor units 20

are stored or the operation stop information on the indoor units 20 in only some of the indoor unit groups are stored.

[0120] If it is determined that the indoor unit control devices 22 respectively store the operation stop information on all the indoor units 20 in step S602, described above, the operation stop information on all the indoor units 20 are respectively stored in the indoor unit control devices 22 (step S603). If it is determined that the operation stop information on the indoor units 20 in only some of the indoor unit groups are stored in step S602, described above, the operation stop information on the indoor units in the indoor unit group, i.e., an indoor unit 20A and an indoor unit 20B in a first indoor unit group 100 in the present embodiment are respectively stored in an indoor unit control device 22A and an indoor unit control device 22B, and operation stop information on the indoor units in a second indoor unit group 200 are not stored (step S604).

[0121] Then, the operation setting information on the indoor units 20 are respectively stored in remote controller control devices 32 (see Fig. 4) (step S605).

[0122] After control from step S602 to step S605, described above, is performed, all devices in the air conditioner 1 are stopped based on the operation inhibition instruction (step S606).

[0123] It is determined whether or not an operation permission instruction has been input to the outdoor unit control device 12 by external input from a manager (step S607). If the operation permission instruction has been input, the respective operations of all the indoor units 20 are resumed based on the operation stop information on the indoor units 20 stored in step S603 or S604 and the operation setting information on the indoor units 20 stored in step S605 or step S610 described below (S611).

[0124] A user may change the operation setting information on the indoor unit 20 while all the devices in the air conditioner 1 are stopped. For example, a cooling temperature may be made lower and an air volume may be made larger than when the operation has been stopped to previously arrange an environment of a room. On the other hand, the manager previously sets in each of the remote controller control devices 32 (see Fig. 4) whether or not the operation setting information on the indoor unit 20 is permitted to be changed while all the devices in the air conditioner 1 are stopped.

[0125] If all the devices in the air conditioner 1 are stopped (step S606), until the operation permission instruction is input (NO in step S607), it is determined whether or not the operation setting information on the indoor unit 20 is changed (step S608). If it is determined that the operation setting information is not changed, the processing returns to step S607. If it is determined that the operation setting information is changed in step S608, it is determined whether or not the operation setting information on the indoor unit 20 has been changed (step S609). If it is determined that the operation setting information has not been changed, the processing returns to step S607. If it is determined that the operation setting information has been changed in step S609, the stored operation setting information on the corresponding indoor unit 20 is changed, i.e., overwritten (step S610). This is repeated until the operation permission instruction is input. When the operation permission instruction is input (YES in step S607), the last operation setting information is reflected when the operation is resumed.

[0126] Thus, the operation setting information can be changed a plurality of times while all the devices in the air conditioner 1 are stopped. Therefore, it is always monitored whether the operation setting information has been changed during the stop.

[0127] As described above, in the air conditioning system according to the present embodiment and the method for controlling the air conditioning system, all the indoor units 20 are operated or stopped by inputting the operation permission instruction or the operation inhibition instruction to the outdoor unit control device 12, the storage section stores the operation stop information on each of the indoor units 20 immediately before the operation inhibition instruction is input, and the outdoor unit control device 12 resumes the respective operations of all the indoor units 20 based on the stored operation stop information when the operation permission instruction is input thereto. Therefore, operability for the manager is improved.

[0128] All the indoor units 20 can be operated or stopped under control of the outdoor unit control device 12. Therefore, the respective operations and stops of the indoor units 20 can be collectively managed, and the operation or stop need not be controlled for each of the indoor units 20. Both the indoor unit 20 and the outdoor unit 10 can be managed because they always remain powered on.

[0129] The storage section stores the operation stop information on the indoor unit 20 immediately before the operation inhibition instruction is input, and the outdoor unit control device 12 resumes the operation based on the operation stop information when the respective operations of all the indoor units 20 are resumed. Therefore, the operation of the indoor unit 20, which had been operated before the stop, for example, is automatically resumed. Therefore, when the indoor unit 20 is desired to be started every time the operation thereof is resumed, the corresponding indoor unit 20 need not be manually started, and respective burdens on the manager and the user can be reduced.

[0130] When the storage sections are respectively provided in the indoor unit control devices 22, the storage sections in the indoor unit control devices 22 respectively store the operation stop information. Therefore, the operation stop information can be distribution-managed, and a risk of a failure can also be dispersed.

[0131] The storage sections in the remote controller control devices 32 respectively store the operation setting information on the indoor units 20. Therefore, the storage capacity of the storage section in the outdoor unit control device 12 or the indoor unit control device 22

is not increased.

[0132] The operation setting information is stored in the storage section in each of the remote controller control devices 32. Therefore, the operation setting information need not be exchanged with the storage section in the outdoor unit control device 12, and the user can instantaneously confirm the operation setting information with the remote controller 30 at hand.

(Fourth Embodiment)

[0133] A fourth embodiment of the present invention will be described below with reference to Fig. 1 and Figs. 7A and 7B.

[0134] While the operation setting information is stored in the indoor unit control device in the above described first embodiment, operation setting information is stored in an outdoor unit control device in the present embodiment. Other points are similar to those in the first embodiment, and hence description thereof is omitted.

[0135] Fig. 1 illustrates a schematic configuration of an air conditioning system according to the present embodiment and a method for controlling the air conditioning system.

[0136] Figs. 7A and 7B are respectively flowcharts illustrating control performed when an operation inhibition instruction of an air conditioner according to the present embodiment is input.

[0137] First, the air conditioner 1 is being operated.

[0138] In the air conditioner 1 that is being operated, the operation inhibition instruction is input to an outdoor unit control device 12 by external input from a manager (step S701).

[0139] When the operation inhibition instruction is input, it is determined whether the outdoor unit control device 12 stores operation stop information on all indoor units 20 or stores operation stop information on the indoor units 20 in only some of indoor unit groups (step S702). The manager previously sets in the outdoor unit control devices 12, respectively, whether the operation stop information on all the indoor units 20 are stored or the operation stop information on the indoor units 20 in only some of the indoor unit groups are stored.

[0140] If it is determined that the outdoor unit control device 12 stores the respective operation stop information on all the indoor units 20 in step S702, described above, the operation stop information on all the indoor units 20 are stored in the outdoor unit control device 12 (step S703). If it is determined that the operation stop information on the indoor units 20 in only some of the indoor unit groups are stored in step S702, described above, the operation stop information on the indoor units in the corresponding indoor unit group, i.e., an indoor unit 20A and an indoor unit 20B in a first indoor unit group 100 in the present embodiment are stored in the outdoor unit control device 12, and the operation stop information on the indoor units in a second indoor unit group 200 are not stored (step S704).

[0141] Then, the operation setting information on each of the indoor units 20 is stored in the outdoor unit control device 12 (step S705).

[0142] After control from step S702 to step S705, described above, is performed, all devices in the air conditioner 1 are stopped based on the operation inhibition instruction (step S706).

[0143] It is determined whether or not an operation permission instruction has been input to the outdoor unit control device 12 by external input from the manager (step S707). If the operation permission instruction has been input, the operations of all the indoor units 20 are respectively resumed based on the operation stop information on the indoor units 20 stored in step S703 or S704 and the operation setting information on each of the indoor units 20 stored in step S705 or step S710 described below (step S711).

[0144] A user may change the operation setting information on the indoor unit 20 while all the devices in the air conditioner 1 are stopped. For example, a cooling temperature may be made lower and an air volume may be made larger than when the operation is stopped to previously arrange an environment of a room, for example. On the other hand, the manager previously sets in the outdoor unit control device 12 whether or not the operation setting information on the indoor unit 20 is permitted to be changed while all the devices in the air conditioner 1 are stopped.

[0145] If all the devices in the air conditioner 1 are stopped (step S706), until the operation permission instruction is input (NO in step S707), it is determined whether or not the operation setting information on the indoor unit 20 is changed (step S708). If it is determined that the operation setting information on the indoor unit 20 is not changed, the processing returns to step S707. If it is determined that the operation setting information on the indoor unit 20 is changed in step S708, it is determined whether or not the operation setting information on the indoor unit 20 has been changed (step S709). If it is determined that the operation setting information on the indoor unit 20 has not been changed, the processing returns to step S707. If it is determined that the operation setting information on the indoor unit 20 has been changed in step S709, the stored operation setting information on the corresponding indoor unit 20 is changed, i.e., overwritten (step S710). This is repeated until the operation permission instruction is input. When the operation permission instruction is input (YES in step S707), the last operation setting information is reflected when the operation is resumed.

[0146] Thus, the operation setting information can also be changed a plurality of times while all the devices in the air conditioner 1 are stopped. Therefore, it is always monitored whether the operation setting information has been changed during the stop.

[0147] As described above, in the air conditioning system according to the present embodiment and the method for controlling the air conditioning system, all the in-

door units 20 are operated or stopped by inputting the operation permission instruction or the operation inhibition instruction to the outdoor unit control device 12, the storage section stores the operation stop information on each of the indoor units 20 immediately before the operation inhibition instruction is input, and the outdoor unit control device 12 resumes the respective operations of all the indoor units 20 based on the stored operation stop information when the operation permission instruction is input thereto. Therefore, operability for the manager is improved.

[0148] All the indoor units 20 can be operated or stopped under control of the outdoor unit control device 12. Therefore, respective operations and stops of the indoor units 20 can be collectively managed, and the operation or stop need not be controlled for each of the indoor units 20. Both the indoor unit 20 and the outdoor unit 10 can be managed because they always remain powered on.

[0149] The storage section stores the operation stop information on the indoor unit 20 immediately before the operation inhibition instruction is input, and the outdoor unit control device 12 resumes the operation based on the operation stop information when the respective operations of all the indoor units 20 are resumed. Therefore, the operation of the indoor unit 20, which had been operated before the stop, for example, is automatically resumed. Therefore, when the indoor unit 20 is desired to be started every time the operation thereof is resumed, the corresponding indoor unit 20 need not be manually started, and respective burdens on the manager and the user can be reduced.

[0150] When the storage section is provided in the outdoor unit control device 12, the storage section in the outdoor unit control device 12 stores the respective operation stop information on all the indoor units 20 connected to the outdoor unit 10. Therefore, the operation stop information can be collectively managed. A backup is easily acquired.

[0151] The storage section in the outdoor unit control device 12 stores the operation stop information and the operation setting information on each of the indoor units 20. Therefore, the one storage section can store the operation stop information and the operation setting information for each of the indoor units 20.

[0152] The respective storage capacities of the storage sections in the indoor unit control device 22 and the remote controller control device 32 are not increased. Further, the storage section in the outdoor unit control device 12 collectively manages all information. Therefore, when control is performed based on the stored information, the information need not be exchanged between the outdoor unit 10 and the indoor unit 20, and an error in the exchange of the information need not be considered.

{Reference Signs List}

[0153]

1 Air conditioner (air conditioning system)
10 Outdoor unit
12 Outdoor unit control device
20 Indoor unit
22 Indoor unit control device

Claims

1. An air conditioning system comprising:

a plurality of indoor units;
an outdoor unit connected to each of the indoor units;
indoor unit control devices that respectively control the indoor units; and
an outdoor unit control device that controls the outdoor unit and each of the indoor units,
the air conditioning system operating or stopping all the indoor units by inputting an operation permission instruction or an operation inhibition instruction to the outdoor unit control device,
the air conditioning system further comprising
a storage section that stores operation stop information on each of the indoor units immediately before the operation inhibition instruction is input,
wherein the outdoor unit control device resumes respective operations of all the indoor units based on the operation stop information stored in the storage section when the operation permission instruction is input thereto.

2. The air conditioning system according to claim 1, wherein the storage section is provided in the outdoor unit control device.

3. The air conditioning system according to claim 1, wherein the storage section is provided in the indoor unit control devices.

4. The air conditioning system according to claim 1, wherein
the indoor unit is controlled by a remote controller control device provided in a remote controller, and
the storage section is provided in the remote controller control device.

5. The air conditioning system according to claim 1 or 2, wherein the storage section is further provided in each of the indoor unit control devices, and the storage sections provided in the indoor unit control devices respectively store information on operation settings such as setting temperatures and air volumes

of the indoor units.

6. The air conditioning system according to any one of claims 1 to 3, wherein the storage section is further provided in each of the remote controller control devices, and the storage sections provided in the remote controller control devices respectively store information on operation settings such as setting temperatures and air volumes of the indoor units.

7. The air conditioning system according to any one of claims 1 to 4, wherein the storage section stores information on operation settings such as setting temperatures and air volumes of each of the indoor units.

8. The air conditioning system according to any one of claims 5 to 7, wherein the storage section enables the operation setting information to be overwritten while the indoor unit is stopped.

9. The air conditioning system according to any one of claims 1 to 8, wherein the plurality of indoor units include
a first indoor unit group including one or a plurality of indoor units, and
a second indoor unit group including one or a plurality of indoor units other than the first indoor unit group, wherein
the storage section stores the operation stop information on each of the indoor units in the first indoor unit group immediately before the operation inhibition instruction is input, and does not store the operation stop information on each of the indoor units in the second indoor unit group, and
the operation of each of the indoor units in the first indoor unit group is resumed based on the stored operation stop information on the indoor units in the first indoor unit group when the operation permission instruction is input, and each of the indoor units in the second indoor unit group remains stopped.

10. A method for controlling an air conditioning system, the air conditioning system comprising:

a plurality of indoor units;
an outdoor unit connected to each of the indoor units;
indoor unit control devices that respectively control the indoor units; and
an outdoor unit control device that controls the outdoor unit and each of the indoor units,
the method comprising the step of operating or stopping all the indoor units by inputting an operation permission instruction or an operation inhibition instruction to the outdoor unit control device, wherein
the air conditioning system further comprises
a storage section that stores operation stop information on each of the indoor units immediately before the operation inhibition instruction is input, and
the outdoor unit control device resumes the respective operations of all the indoor units based on the operation stop information stored in the storage sections when the operation permission instruction is input thereto.

FIG. 1

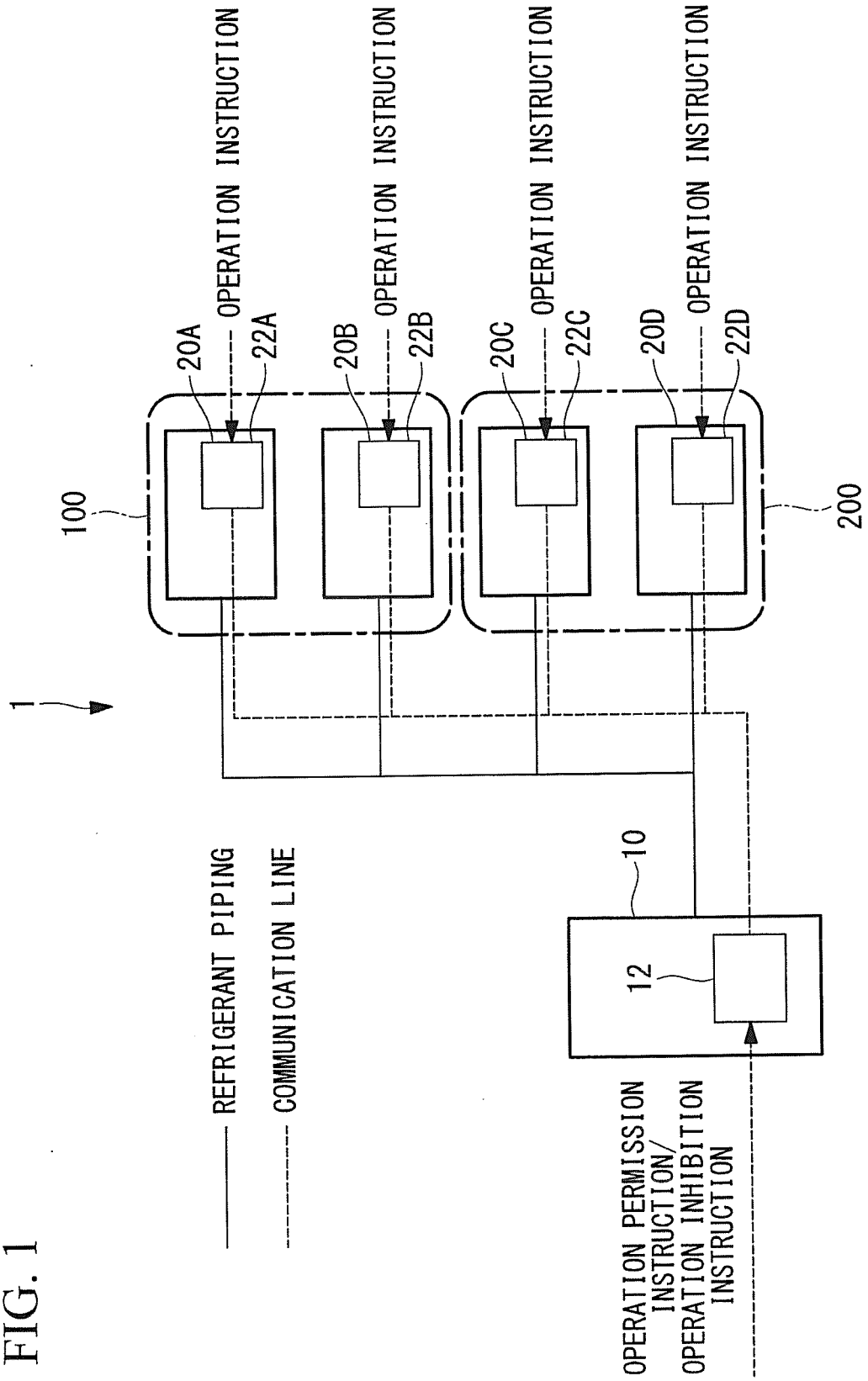

1
100
200
20A
22A
20B
22B
20C
22C
20D
22D
OPERATION INSTRUCTION
OPERATION INSTRUCTION
OPERATION INSTRUCTION
OPERATION INSTRUCTION
10
12
REFRIGERANT PIPING
COMMUNICATION LINE
OPERATION PERMISSION INSTRUCTION/
OPERATION INHIBITION INSTRUCTION

FIG. 2A

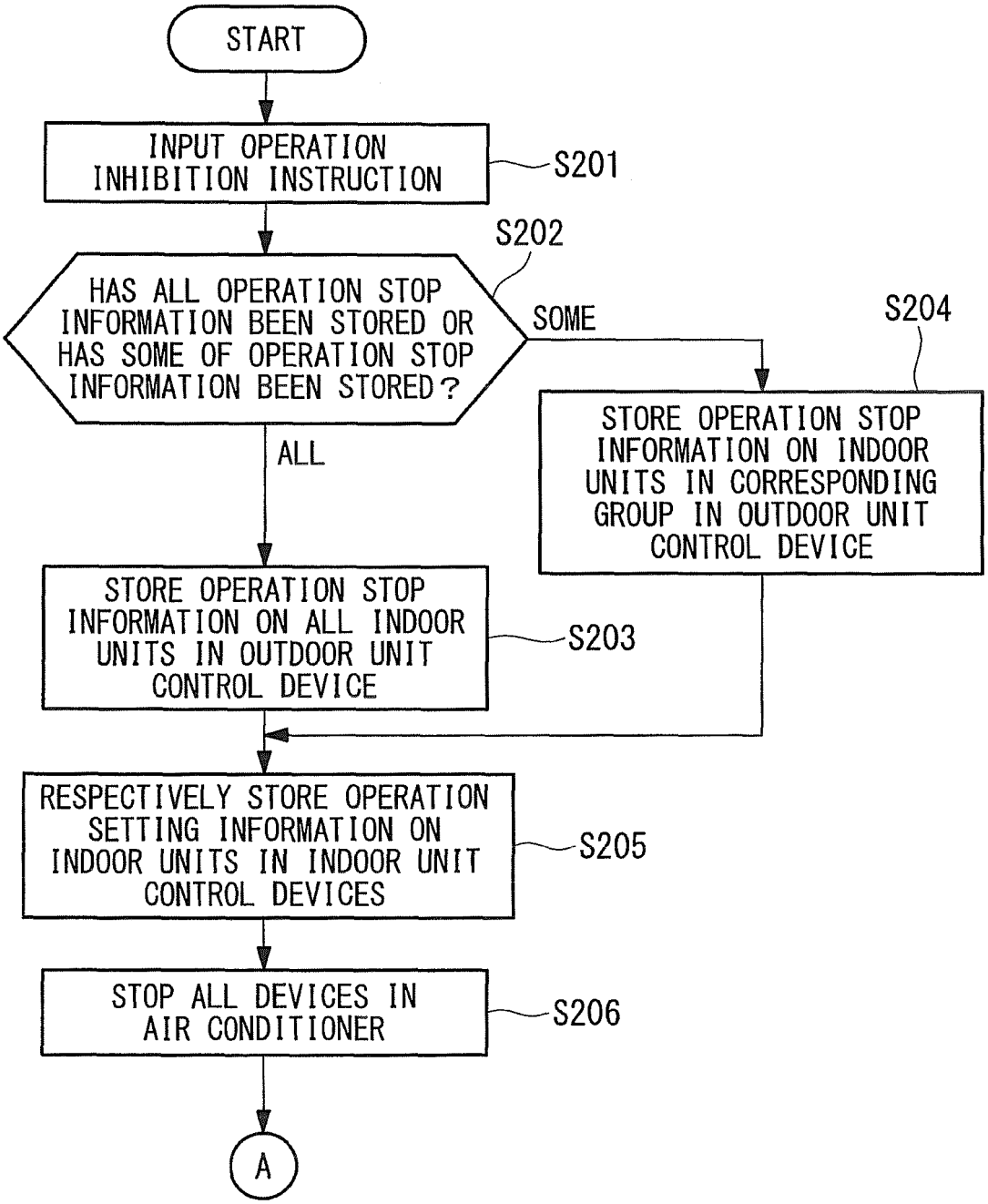

START
INPUT OPERATION INHIBITION INSTRUCTION
S201
S202
HAS ALL OPERATION STOP INFORMATION BEEN STORED OR HAS SOME OF OPERATION STOP INFORMATION BEEN STORED?
SOME
S204
STORE OPERATION STOP INFORMATION ON INDOOR UNITS IN CORRESPONDING GROUP IN OUTDOOR UNIT CONTROL DEVICE
ALL
STORE OPERATION STOP INFORMATION ON ALL INDOOR UNITS IN OUTDOOR UNIT CONTROL DEVICE
S203
RESPECTIVELY STORE OPERATION SETTING INFORMATION ON INDOOR UNITS IN INDOOR UNIT CONTROL DEVICES
S205
STOP ALL DEVICES IN AIR CONDITIONER
S206
A

FIG. 2B

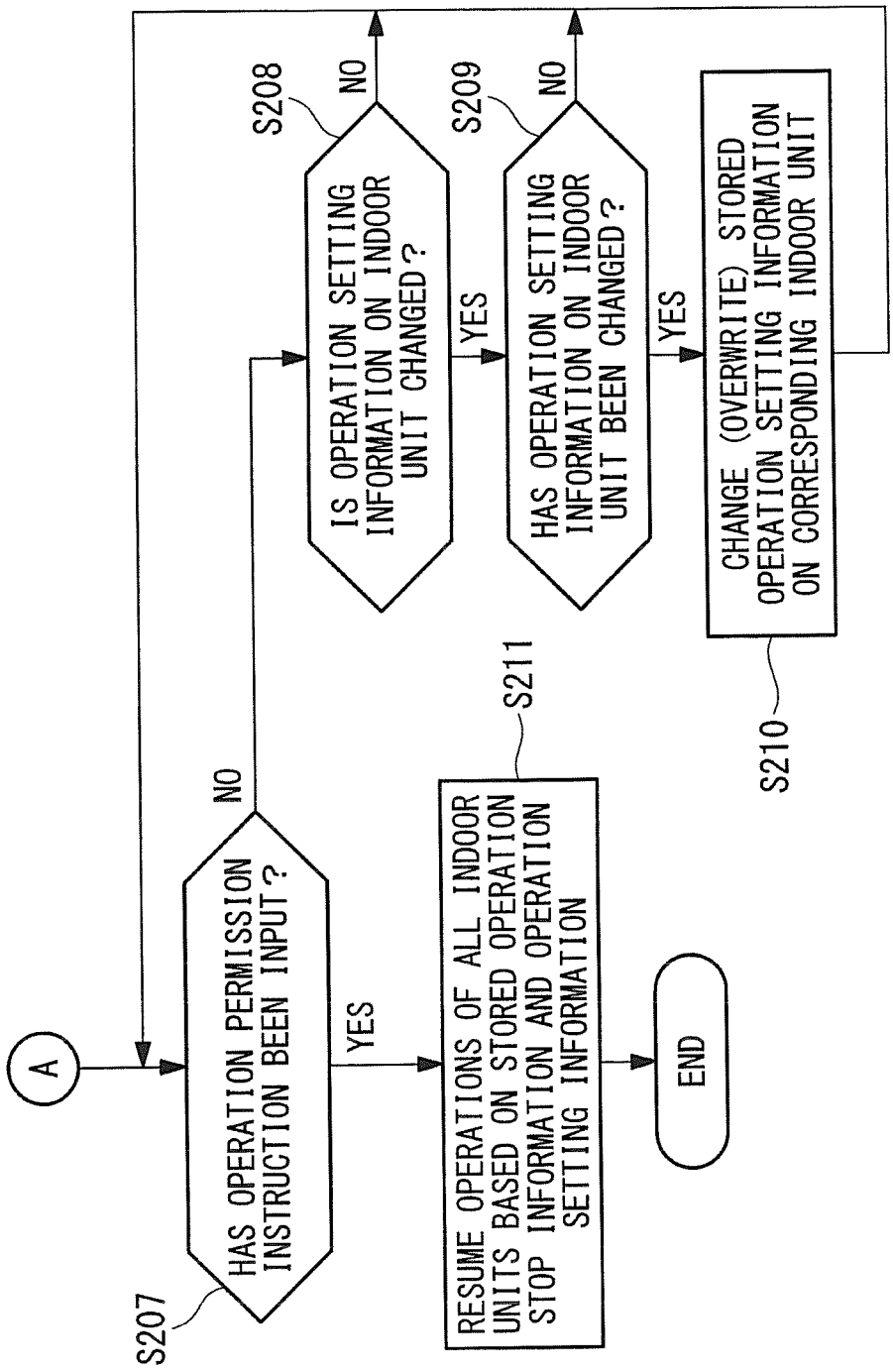

A
S207
HAS OPERATION PERMISSION INSTRUCTION BEEN INPUT?
NO
YES
S208
IS OPERATION SETTING INFORMATION ON INDOOR UNIT CHANGED?
NO
YES
S209
HAS OPERATION SETTING INFORMATION ON INDOOR UNIT BEEN CHANGED?
NO
YES
S210
CHANGE (OVERWRITE) STORED OPERATION SETTING INFORMATION ON CORRESPONDING INDOOR UNIT
S211
RESUME OPERATIONS OF ALL INDOOR UNITS BASED ON STORED OPERATION STOP INFORMATION AND OPERATION SETTING INFORMATION
END

FIG. 3A

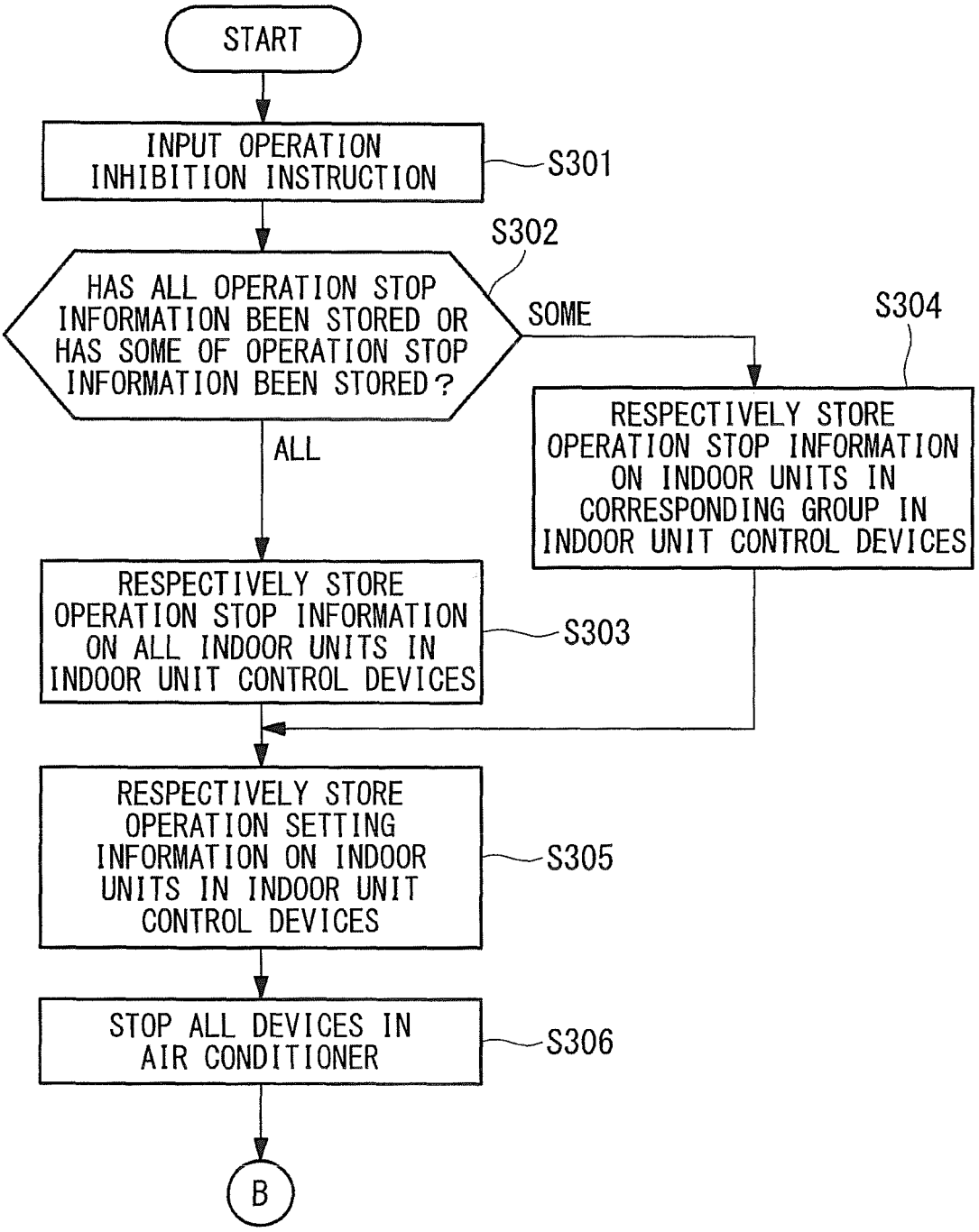

START
INPUT OPERATION INHIBITION INSTRUCTION
S301
S302
HAS ALL OPERATION STOP INFORMATION BEEN STORED OR HAS SOME OF OPERATION STOP INFORMATION BEEN STORED?
SOME
S304
ALL
RESPECTIVELY STORE OPERATION STOP INFORMATION ON INDOOR UNITS IN CORRESPONDING GROUP IN INDOOR UNIT CONTROL DEVICES
RESPECTIVELY STORE OPERATION STOP INFORMATION ON ALL INDOOR UNITS IN INDOOR UNIT CONTROL DEVICES
S303
RESPECTIVELY STORE OPERATION SETTING INFORMATION ON INDOOR UNITS IN INDOOR UNIT CONTROL DEVICES
S305
STOP ALL DEVICES IN AIR CONDITIONER
S306
B

FIG. 3B

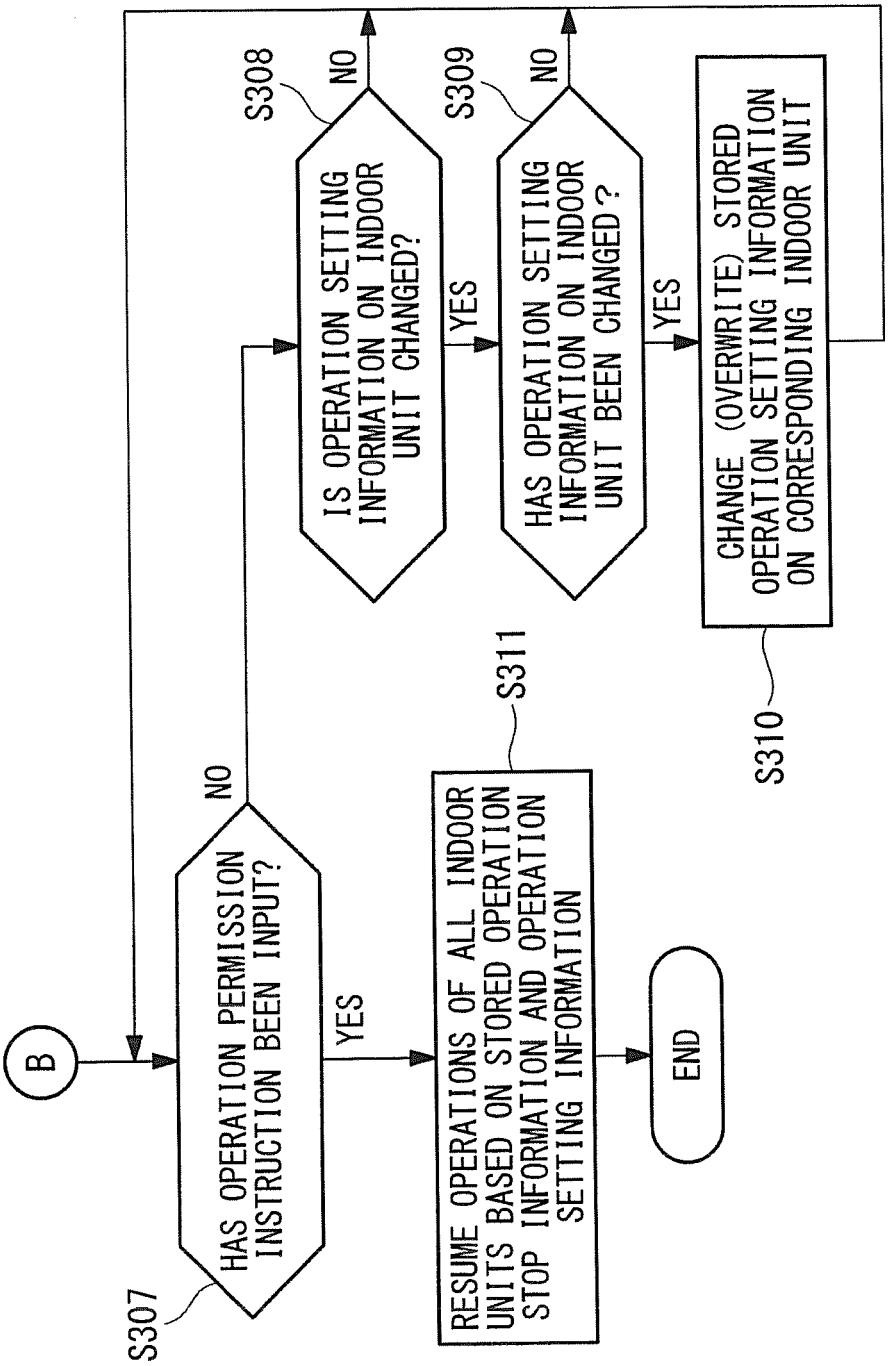

B
HAS OPERATION PERMISSION INSTRUCTION BEEN INPUT?
S307
NO
YES
IS OPERATION SETTING INFORMATION ON INDOOR UNIT CHANGED?
S308
NO
YES
HAS OPERATION SETTING INFORMATION ON INDOOR UNIT BEEN CHANGED?
S309
NO
YES
CHANGE (OVERWRITE) STORED OPERATION SETTING INFORMATION ON CORRESPONDING INDOOR UNIT
S310
RESUME OPERATIONS OF ALL INDOOR UNITS BASED ON STORED OPERATION STOP INFORMATION AND OPERATION SETTING INFORMATION
S311
END

FIG. 4

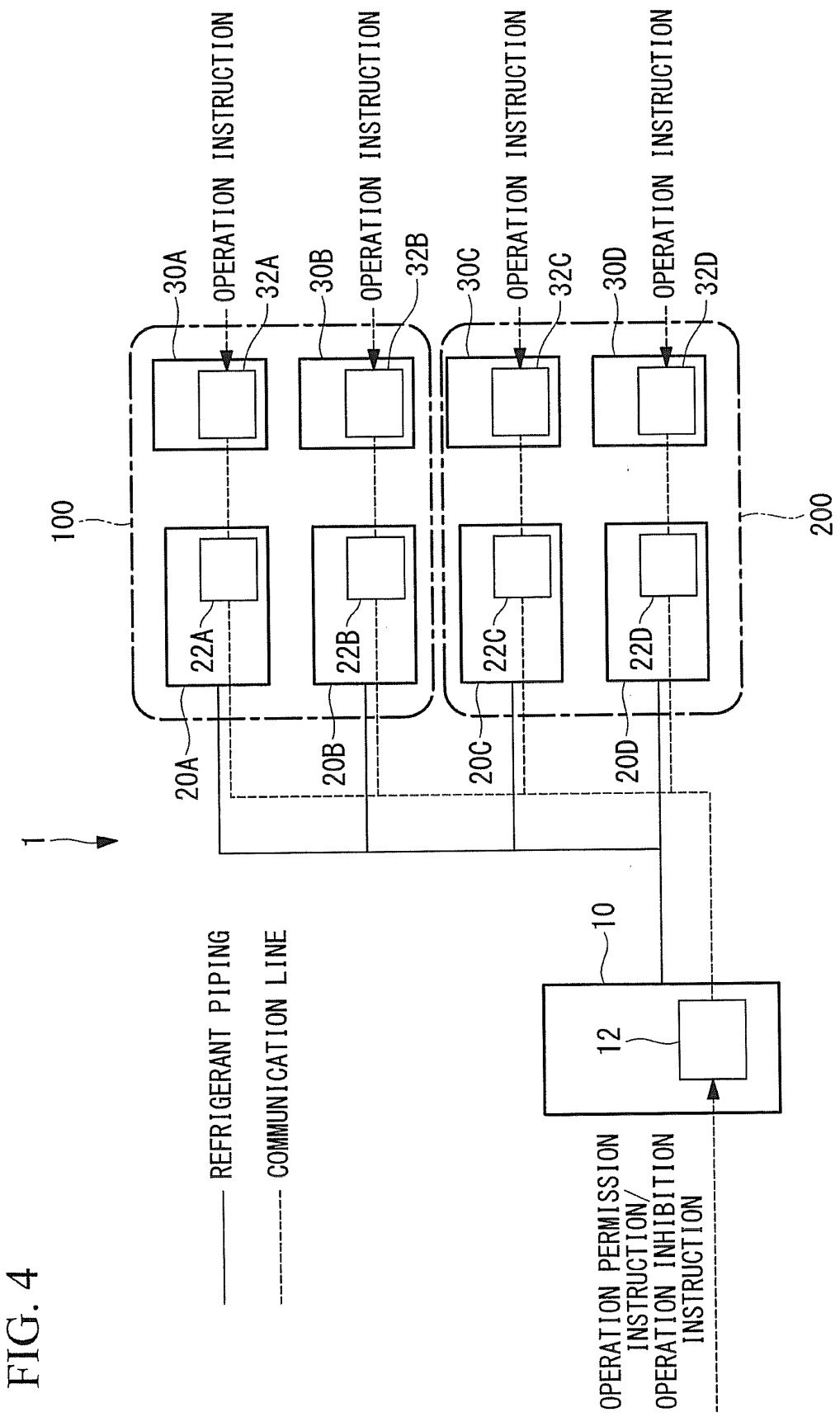

1
100
200
10
12
30A
30B
30C
30D
32A
32B
32C
32D
22A
22B
22C
22D
20A
20B
20C
20D
OPERATION INSTRUCTION
OPERATION INSTRUCTION
OPERATION INSTRUCTION
OPERATION INSTRUCTION
REFRIGERANT PIPING
COMMUNICATION LINE
OPERATION PERMISSION INSTRUCTION/ OPERATION INHIBITION INSTRUCTION

FIG. 5A

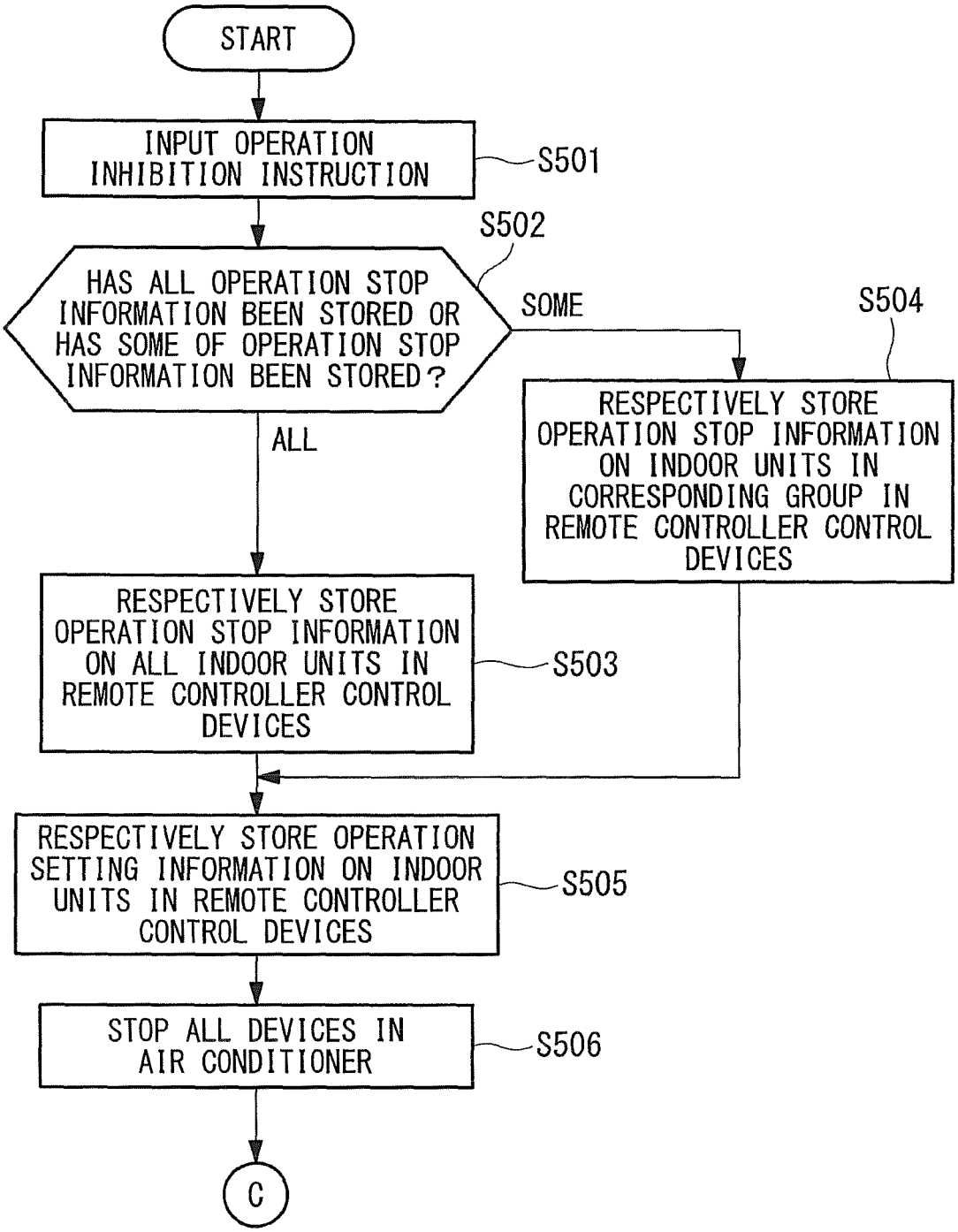

START
INPUT OPERATION INHIBITION INSTRUCTION
S501
S502
HAS ALL OPERATION STOP INFORMATION BEEN STORED OR HAS SOME OF OPERATION STOP INFORMATION BEEN STORED?
SOME
S504
RESPECTIVELY STORE OPERATION STOP INFORMATION ON INDOOR UNITS IN CORRESPONDING GROUP IN REMOTE CONTROLLER CONTROL DEVICES
ALL
RESPECTIVELY STORE OPERATION STOP INFORMATION ON ALL INDOOR UNITS IN REMOTE CONTROLLER CONTROL DEVICES
S503
RESPECTIVELY STORE OPERATION SETTING INFORMATION ON INDOOR UNITS IN REMOTE CONTROLLER CONTROL DEVICES
S505
STOP ALL DEVICES IN AIR CONDITIONER
S506
C

FIG. 5B

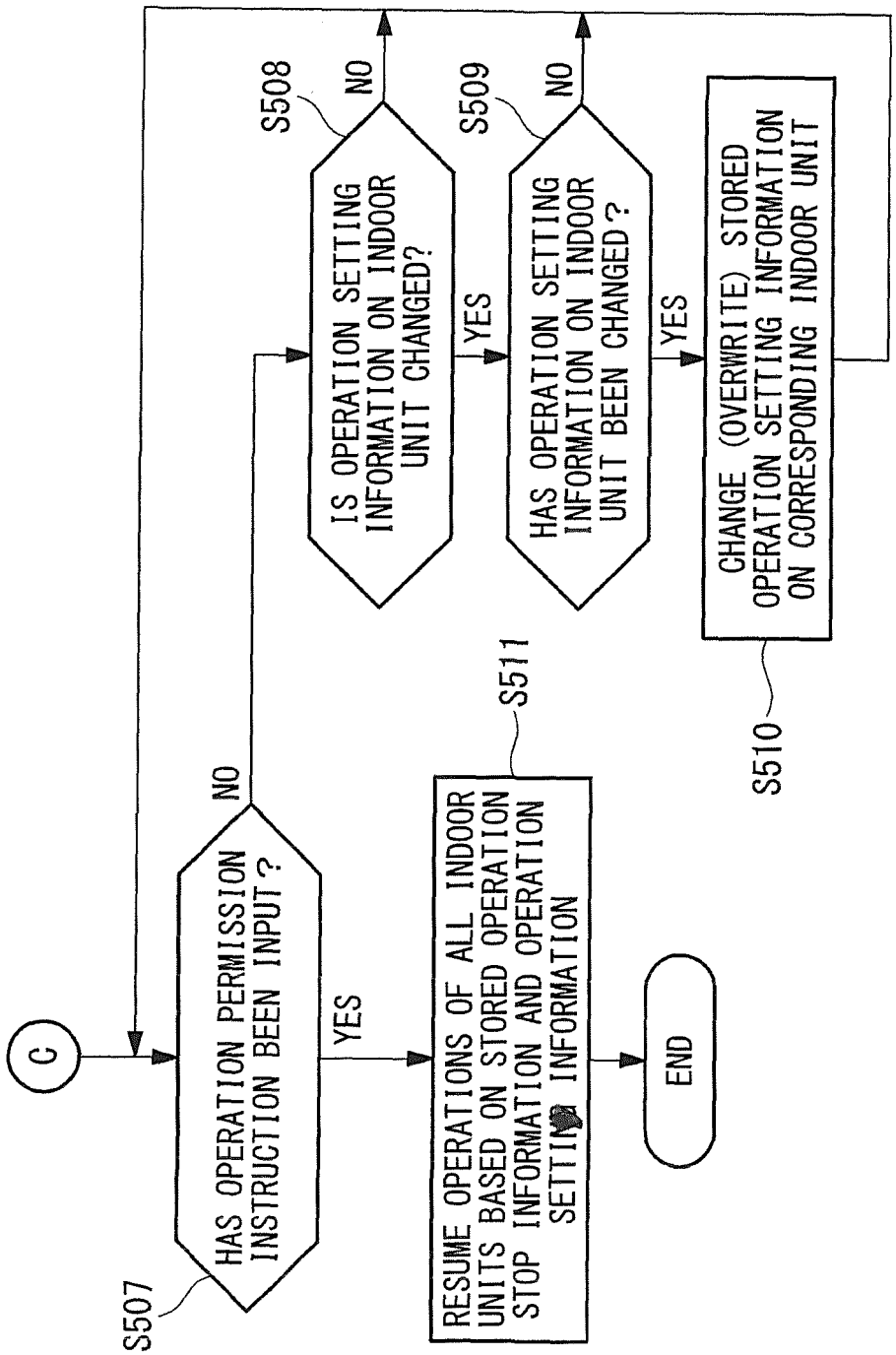

C
S507
HAS OPERATION PERMISSION INSTRUCTION BEEN INPUT?
NO
YES
S508
IS OPERATION SETTING INFORMATION ON INDOOR UNIT CHANGED?
NO
YES
S509
HAS OPERATION SETTING INFORMATION ON INDOOR UNIT BEEN CHANGED?
NO
YES
S510
CHANGE (OVERWRITE) STORED OPERATION SETTING INFORMATION ON CORRESPONDING INDOOR UNIT
S511
RESUME OPERATIONS OF ALL INDOOR UNITS BASED ON STORED OPERATION STOP INFORMATION AND OPERATION SETTING INFORMATION
END

FIG. 6A

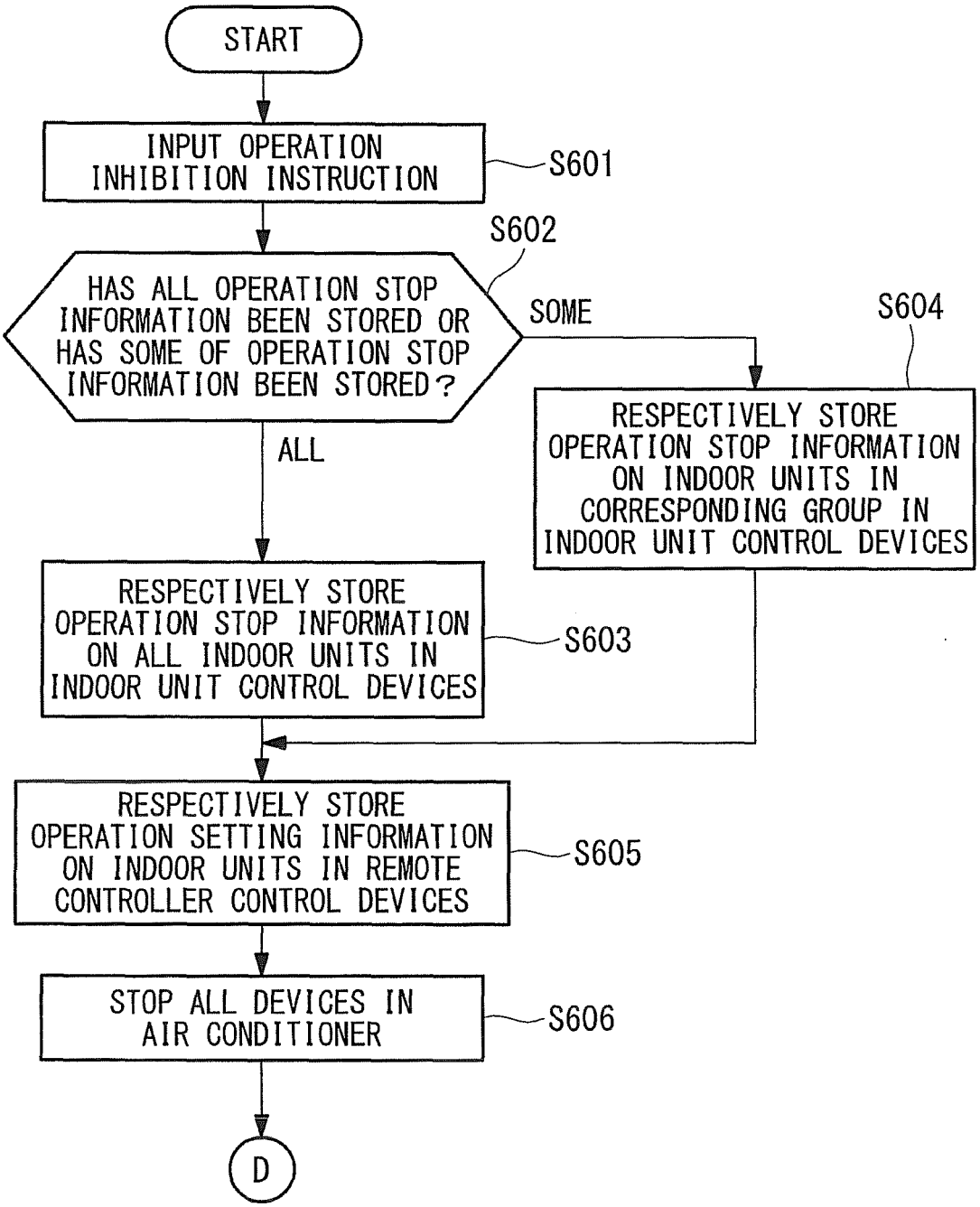

START
INPUT OPERATION INHIBITION INSTRUCTION
S601
S602
HAS ALL OPERATION STOP INFORMATION BEEN STORED OR HAS SOME OF OPERATION STOP INFORMATION BEEN STORED?
SOME
S604
RESPECTIVELY STORE OPERATION STOP INFORMATION ON INDOOR UNITS IN CORRESPONDING GROUP IN INDOOR UNIT CONTROL DEVICES
ALL
RESPECTIVELY STORE OPERATION STOP INFORMATION ON ALL INDOOR UNITS IN INDOOR UNIT CONTROL DEVICES
S603
RESPECTIVELY STORE OPERATION SETTING INFORMATION ON INDOOR UNITS IN REMOTE CONTROLLER CONTROL DEVICES
S605
STOP ALL DEVICES IN AIR CONDITIONER
S606
D

FIG. 6B

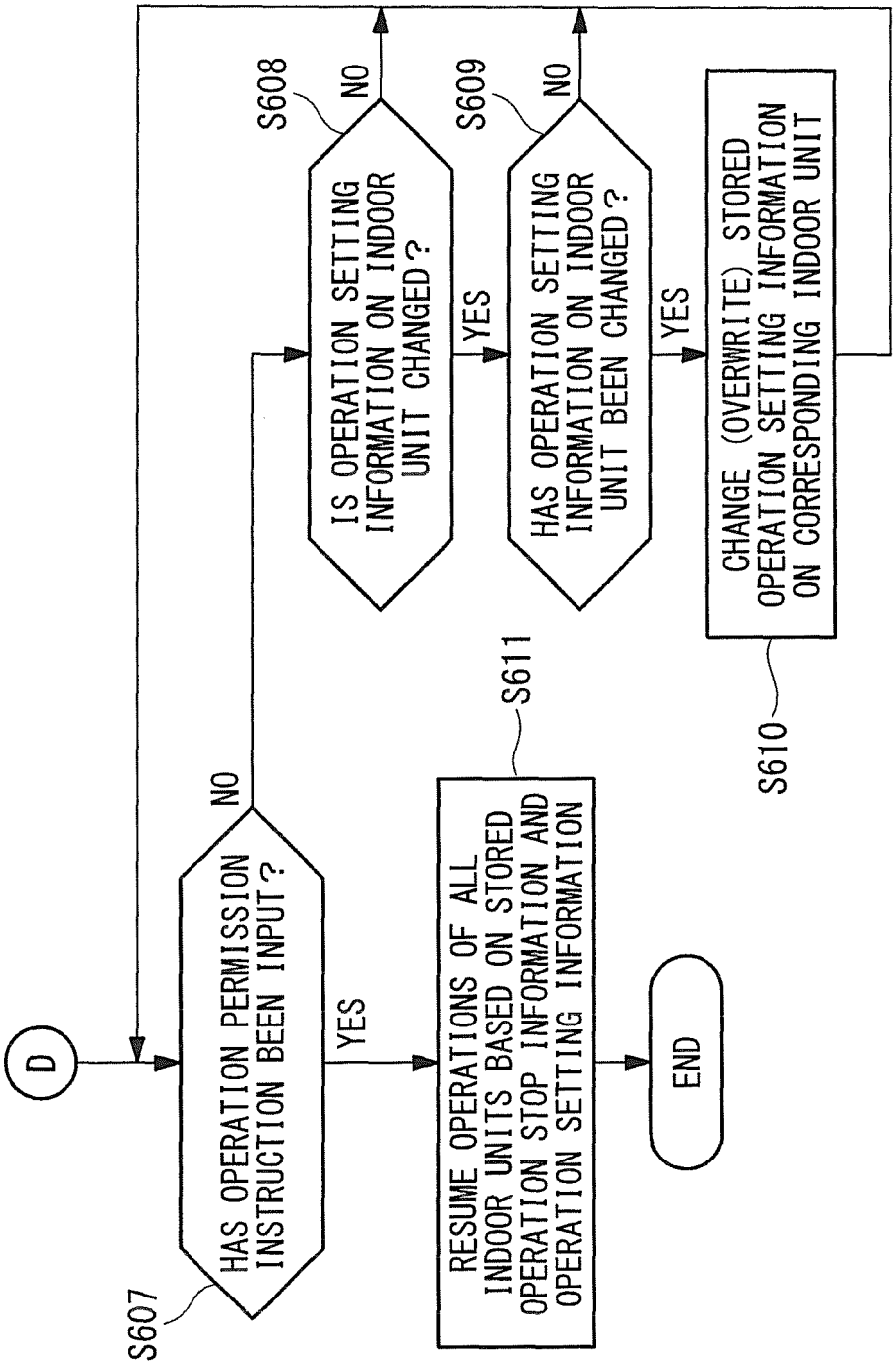

D
S607
HAS OPERATION PERMISSION INSTRUCTION BEEN INPUT?
NO
YES
S608
IS OPERATION SETTING INFORMATION ON INDOOR UNIT CHANGED?
NO
YES
S609
HAS OPERATION SETTING INFORMATION ON INDOOR UNIT BEEN CHANGED?
NO
YES
S610
CHANGE (OVERWRITE) STORED OPERATION SETTING INFORMATION ON CORRESPONDING INDOOR UNIT
S611
RESUME OPERATIONS OF ALL INDOOR UNITS BASED ON STORED OPERATION STOP INFORMATION AND OPERATION SETTING INFORMATION
END

FIG. 7A

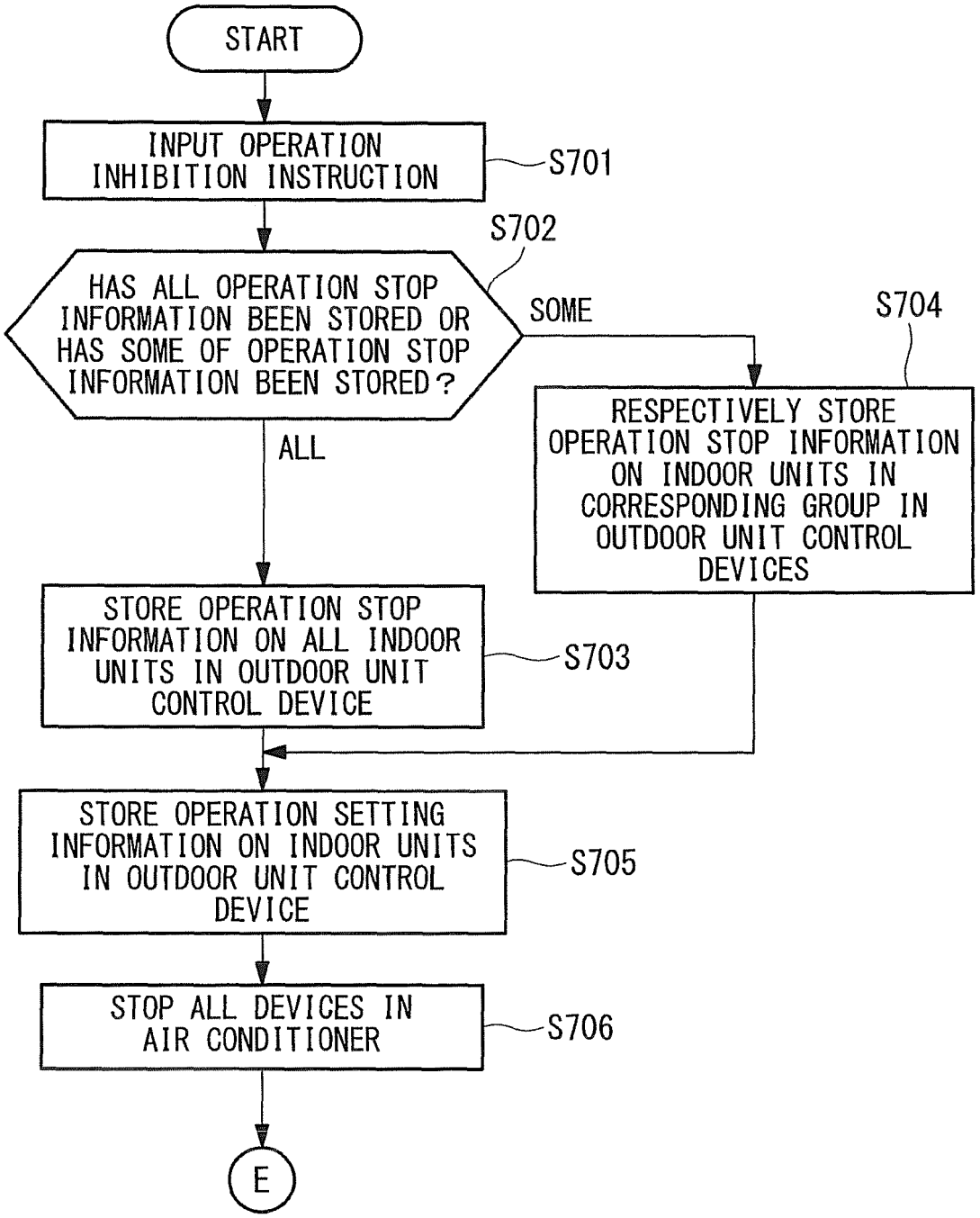
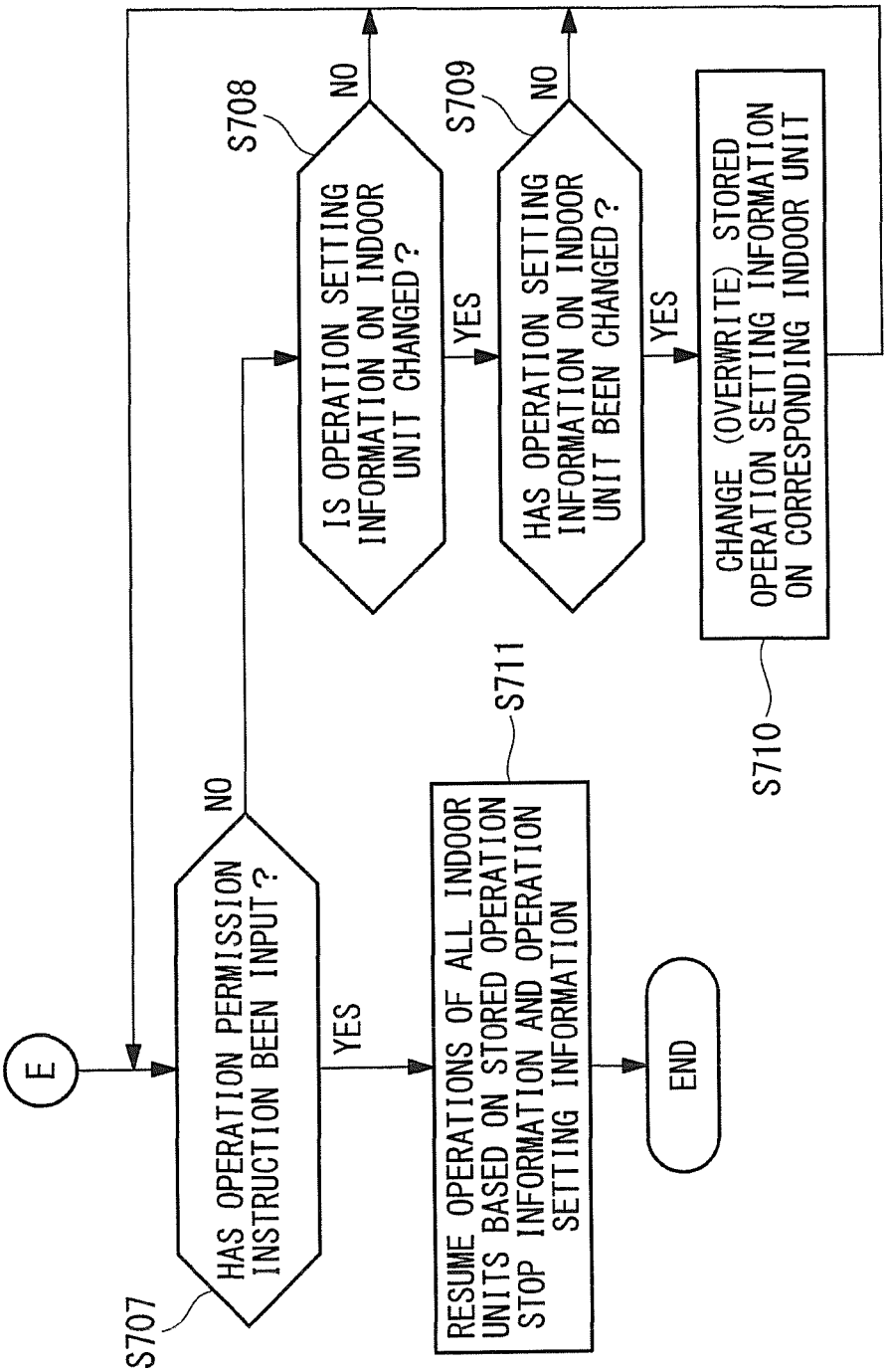

START
INPUT OPERATION INHIBITION INSTRUCTION
S701
S702
HAS ALL OPERATION STOP INFORMATION BEEN STORED OR HAS SOME OF OPERATION STOP INFORMATION BEEN STORED?
SOME
S704
ALL
RESPECTIVELY STORE OPERATION STOP INFORMATION ON INDOOR UNITS IN CORRESPONDING GROUP IN OUTDOOR UNIT CONTROL DEVICES
STORE OPERATION STOP INFORMATION ON ALL INDOOR UNITS IN OUTDOOR UNIT CONTROL DEVICE
S703
STORE OPERATION SETTING INFORMATION ON INDOOR UNITS IN OUTDOOR UNIT CONTROL DEVICE
S705
STOP ALL DEVICES IN AIR CONDITIONER
S706
E

FIG. 7B


E
S707
HAS OPERATION PERMISSION INSTRUCTION BEEN INPUT?
NO
YES
S708
IS OPERATION SETTING INFORMATION ON INDOOR UNIT CHANGED?
NO
YES
S709
HAS OPERATION SETTING INFORMATION ON INDOOR UNIT BEEN CHANGED?
NO
YES
S710
CHANGE (OVERWRITE) STORED OPERATION SETTING INFORMATION ON CORRESPONDING INDOOR UNIT
S711
RESUME OPERATIONS OF ALL INDOOR UNITS BASED ON STORED OPERATION STOP INFORMATION AND OPERATION SETTING INFORMATION
END

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2014/082012

A. CLASSIFICATION OF SUBJECT MATTER
F24F11/02(2006.01)i

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
F24F11/02

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2015
Kokai Jitsuyo Shinan Koho 1971-2015 Toroku Jitsuyo Shinan Koho 1994-2015

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	JP 2000-213796 A (Matsushita Electric Industrial Co., Ltd.), 02 August 2000 (02.08.2000), paragraphs [0012] to [0030]; fig. 1 to 9 (Family: none)	1,7-8,10 2-6,9
Y	JP 2012-13329 A (Mitsubishi Electric Corp.), 19 January 2012 (19.01.2012), paragraphs [0013], [0015], [0030] to [0040], [0053] to [0054] (Family: none)	2-3,5,9
Y	JP 2005-201494 A (Sanyo Electric Co., Ltd.), 28 July 2005 (28.07.2005), paragraph [0018] & EP 1555490 A1 & KR 10-2005-0074912 A & CN 1641280 A	4,6

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
02 March 2015 (02.03.15)	10 March 2015 (10.03.15)
Name and mailing address of the ISA/ Japan Patent Office 3-4-3,Kasumigaseki,Chiyoda-ku, Tokyo 100-8915,Japan	Authorized officer Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2014/082012

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 2009-41830 A (Panasonic Corp.), 26 February 2009 (26.02.2009), paragraphs [0035] to [0039] (Family: none)	9

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 2001241740 A **[0003]**