



(12)

EUROPEAN PATENT APPLICATION

(43)

Date of publication:
12.02.2014 Bulletin 2014/07

(51)

Int Cl.:
F24F 11/00 (2006.01)

(21)

Application number: 13179410.9

(22)

Date of filing: 06.08.2013

(84) Designated Contracting States: AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR Designated Extension States: BA ME	(71) Applicant: Mitsubishi Electric Corporation Chiyoda-ku Tokyo 100-8310 (JP) (72) Inventor: Takahara, Hideki Tokyo, 100-8310 (JP) (74) Representative: Pfenning, Meinig & Partner GbR Patent- und Rechtsanwälte Theresienhöhe 13 80339 München (DE)
(30) Priority: 09.08.2012 JP 2012177594	

(54)

Air-conditioning remote controller, indoor unit, and air-conditioning system

(57)

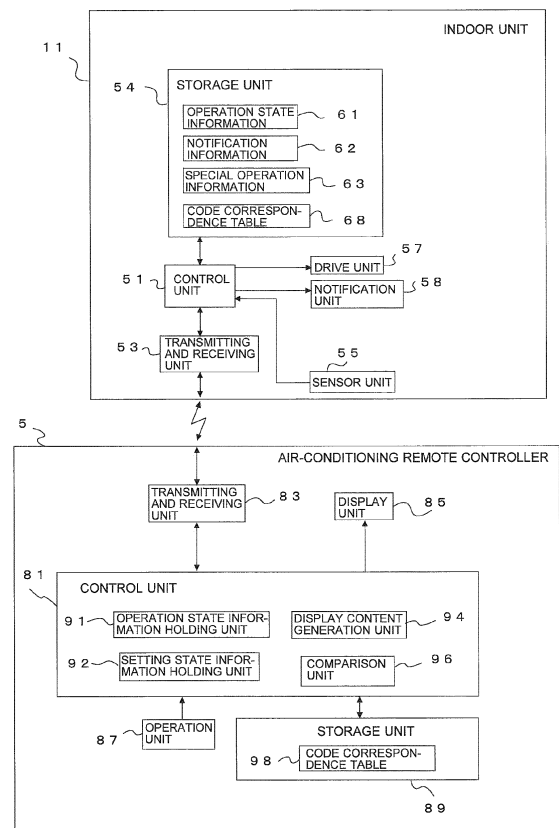
A remote controller (5) capable of notifying whether or not the operation content of an indoor unit (11) and settings on a remote controller are consistent.

An air-conditioning remote controller (5) for transmitting a control command to an indoor unit (11) includes a transmitting and receiving unit (83) that receives an operation content of the indoor unit (11), a control unit (81) that compares the operation content of the indoor unit (11) with a setting on the air-conditioning remote controller (5), and a display unit (85) that displays display content based on a comparison result obtained by the control unit (81). The control unit (81) causes the display unit (85) to give notification of presence of an inconsistency between the operation content of the indoor unit (11) and the setting on the air-conditioning remote controller (5) and at least one of the cause of the inconsistency and a method for making the operation and the setting consistent if inconsistency is present between the operation and the setting in a special operation mode in which the indoor unit 11 performs determination and performs operation.

A indoor unit (11) for receiving a cotrol command fro an air-conditioning remote controller (5).

An air-conditioning system (1) comprising the air-conditioning remote controller (5) and an air conditioning apparatus including an indoor unit (11) and an outdoor unit (15).

FIG. 2



Description

[Technical Field]

[0001] The present invention relates to an air-conditioning remote controller, an indoor unit, and an air-conditioning system.

[Background Art]

[0002] Some existing air-conditioning remote controllers for air-conditioning apparatuses are configured to flash and display any inconsistencies between the operation content of indoor units and settings on the air-conditioning remote controllers by using display units if there are inconsistencies (see, for example, Patent Literature 1).

[Citation List]

[Patent Literature]

[0003] [Patent Literature 1] Japanese Unexamined Patent Application Publication No. 2002-81724 (paragraph [0010])

[Summary of Invention]

[Technical Problem]

[0004] Some recent air-conditioning apparatuses have incorporated therein various sensors such as a pyroelectric sensor, a thermopile sensor, a radiation sensor, a temperature and humidity sensor, and a camera, and the operation state of the air-conditioning apparatuses is automatically changed in accordance with various information detected by the various sensors. An air-conditioning remote controller described in Patent Literature 1 simply makes any inconsistencies between the operation content of an indoor unit and settings on the air-conditioning remote controller be displayed but does not give notification of the cause of the inconsistencies or a method for correcting the inconsistencies to provide a consistent state.

Consequently, there has been a problem in that improvements in usability and convenience are not achievable.

[0005] The present invention has been made in order to overcome the foregoing problem, and it is an object thereof to provide an air-conditioning remote controller, an indoor unit, and an air-conditioning system, which are capable of giving notification of any inconsistency between the operation content of the indoor unit and settings on the air-conditioning remote controller if there is such an inconsistency due to the automatic change of the operation state, the cause of the inconsistencies, and a method for correcting the inconsistencies to provide a consistent state by using a display unit.

[Solution to Problem]

[0006] An air-conditioning remote controller according to the present invention is an air-conditioning remote controller including a transmitting and receiving unit that transmits a control command to an indoor unit and receives an operation content of the indoor unit, a control unit that compares the operation content of the indoor unit with a setting on the air-conditioning remote controller, and a display unit that displays display content based on a comparison result obtained by the control unit, wherein the control unit causes the display unit to give notification of presence of an inconsistency between the operation content of the indoor unit and the setting on the air-conditioning remote controller and at least one of a cause of the inconsistency and a method for making the operation content of the indoor unit and the setting on the air-conditioning remote controller consistent in a case where inconsistency is present between the operation content of the indoor unit and the setting on the air-conditioning remote controller in a special operation mode in which the indoor unit performs determination and performs operation.

[Advantageous Effects of Invention]

[0007] According to the present invention, notification of any inconsistencies between the operation content of an indoor unit and settings on an air-conditioning remote controller, the cause of the inconsistencies, and a method for correcting the inconsistencies to provide a consistent state are notified using a display unit if there are inconsistencies due to the automatic change of the operation state. This makes it possible to notify a user of any inconsistencies in content between the operation and the settings, the cause of the inconsistencies, and a method for correcting the inconsistencies to provide a constant state. Therefore, there is an advantage of improving usability and convenience.

[Brief Description of Drawings]

[0008]

[Fig. 1] Fig. 1 is a diagram illustrating a schematic configuration of an air-conditioning system 1 according to Embodiment 1 of the present invention.

[Fig. 2] Fig. 2 is a block diagram illustrating an example electrical configuration of an indoor unit 11 and an air-conditioning remote controller 5 according to Embodiment 1 of the present invention.

[Fig. 3] Fig. 3 is a diagram illustrating an example of a code correspondence table 98 stored in a storage unit 89 according to Embodiment 1 of the present invention.

[Fig. 4] Fig. 4 is a diagram illustrating an example of a code correspondence table 68 stored in a storage unit 54 according to Embodiment 1 of the present

invention.

[Fig. 5] Fig. 5 is a diagram illustrating an example configuration of the external appearance of the air-conditioning remote controller 5 according to Embodiment 1 of the present invention.

[Fig. 6] Fig. 6 is a flowchart depicting an example of control performed by a control unit 51 and a control unit 81 according to Embodiment 1 of the present invention.

[Fig. 7] Fig. 7 is a diagram illustrating an example of the code correspondence table 98, which is stored in the storage unit 89 while the operation mode is not a special operation mode, according to Embodiment 1 of the present invention.

[Fig. 8] Fig. 8 is a diagram illustrating an example of display on the air-conditioning remote controller 5 according to Embodiment 1 of the present invention in a case where operation state information and setting state information are consistent.

[Fig. 9] Fig. 9 is a diagram illustrating an example of the code correspondence table 98, which is stored in the storage unit 89 while in the special operation mode, according to Embodiment 1 of the present invention.

[Fig. 10] Fig. 10 is a diagram illustrating an example of display on the air-conditioning remote controller 5 according to Embodiment 1 of the present invention in a case where the operation state information and the setting state information are not consistent.

[Fig. 11] Fig. 11 is a diagram illustrating another example of display on the air-conditioning remote controller 5 according to Embodiment 1 of the present invention in a case where the operation state information and the setting state information are not consistent.

[Fig. 12] Fig. 12 is a diagram illustrating a first example of separate display on the air-conditioning remote controller 5 according to Embodiment 1 of the present invention in a case where the operation state information and the setting state information are not consistent.

[Fig. 13] Fig. 13 is a diagram illustrating a second example of separate display on the air-conditioning remote controller 5 according to Embodiment 1 of the present invention in a case where the operation state information and the setting state information are not consistent.

[Fig. 14] Fig. 14 is a diagram illustrating a third example of separate display on the air-conditioning remote controller 5 according to Embodiment 1 of the present invention in a case where the operation state information and the setting state information are not consistent.

[Fig. 15] Fig. 15 is a diagram illustrating another example configuration of the external appearance of the air-conditioning remote controller 5 according to Embodiment 1 of the present invention.

[Fig. 16] Fig. 16 is a block diagram illustrating an

example electrical configuration of an indoor unit 11 and an air-conditioning remote controller 5 according to Embodiment 2 of the present invention.

[Fig. 17] Fig. 17 is a flowchart depicting an example of control performed by a control unit 51 and a control unit 81 according to Embodiment 2 of the present invention.

[Fig. 18] Fig. 18 is a diagram illustrating a schematic configuration of an air-conditioning system 1 according to Embodiment 3 of the present invention.

[Description of Embodiments]

[0009] Embodiments of the present invention will be described in detail hereinafter with reference to the drawings.

Embodiment 1.

[0010] Fig. 1 is a diagram illustrating a schematic configuration of an air-conditioning system 1 according to Embodiment 1 of the present invention. As illustrated in Fig. 1, the air-conditioning system 1 is configured such that an air-conditioning apparatus 3 including an indoor unit 11 and an outdoor unit 15 communicates with an air-conditioning remote controller 5 via a communication medium. That is, the air-conditioning remote controller 5 is configured to transmit and receive control commands, information being related to the operation content of the indoor unit 11 in the air-conditioning apparatus 3, and so forth through mutual communication with the indoor unit 11.

[0011] An example configuration of the external appearance of the air-conditioning remote controller 5, an example configuration of the interior of the air-conditioning remote controller 5, and the details of processing of the air-conditioning remote controller 5 will be described below.

Further, the communication medium is not particularly limited. The communication medium may be, for example, wireless or wired. While in the foregoing description, the description has been given of an example in which the indoor unit 11 mutually communicates with the air-conditioning remote controller 5, the present invention is not particularly limited thereto. For example, although not illustrated in the drawings, the outdoor unit 15 may mutually communicate with the air-conditioning remote controller 5 to transmit and receive information being related to the operation content of the indoor unit 11 in the air-conditioning apparatus 3 and so forth.

[0012] The air-conditioning apparatus 3 includes a refrigerant circuit (not illustrated), and supplies cold air, warm air, or the like to the room by performing a cooling operation or heating operation. The refrigerant circuit is filled with refrigerant, and performs a vapor-compression refrigeration cycle by causing the refrigerant to circulate in a refrigerant pipe. The refrigerant circuit is formed by, for example, connecting a compressor provided in the

outdoor unit 15, an indoor heat exchanger provided in the indoor unit 11, an expansion valve provided in the outdoor unit 15, and an outdoor heat exchanger provided in the outdoor unit 15 (all of which are not illustrated).

[0013] Fig. 2 is a block diagram illustrating an example electrical configuration of the indoor unit 11 and the air-conditioning remote controller 5 according to Embodiment 1 of the present invention. As illustrated in Fig. 2, the air-conditioning remote controller 5 includes a control unit 81, a transmitting and receiving unit 83, a display unit 85, an operation unit 87, a storage unit 89, and so forth. The indoor unit 11 includes a control unit 51, a transmitting and receiving unit 53, a storage unit 54, a sensor unit 55, a drive unit 57, a notification unit 58, and so forth.

[0014] An example electrical configuration of the air-conditioning remote controller 5 will be described. The description will be given here of a function configuration of the air-conditioning remote controller 5. The external appearance of the air-conditioning remote controller 5 will be described below with reference to Fig. 5, and the operation will be described below with reference to Figs. 6 to 11.

[0015] The control unit 81 fetches a processing program or the like from the storage unit 89, and executes the processing program or the like in accordance with the frequency of an oscillator (not illustrated) that supplies a constant clock. When the operation unit 87 is operated by a user, the control unit 81 supplies a control command that is a code for controlling the air-conditioning apparatus 3 to the transmitting and receiving unit 83 or supplies the operation result obtained by the operation unit 87 to the display unit 85 in accordance with the operation.

Specifically, the control unit 81 includes an operation state information holding unit 91, a setting state information holding unit 92, a display content generation unit 94, and a comparison unit 96.

[0016] Since the control unit 81 is mainly constituted by, for example, a microprocessor unit, the operation state information holding unit 91 and the setting state information holding unit 92 are formed by units associated with the microprocessor unit, such as a register and a cache memory (all of which are not illustrated).

The operation state information holding unit 91 is configured to hold information being related to the operation content of the indoor unit 11, which is acquired from the transmitting and receiving unit 53 of the indoor unit 11. Examples of the information being related to the operation content of the indoor unit 11 include special operation information, operation state information, and notification information. These pieces of information are encoded into codes, and the codes are held in the operation state information holding unit 91.

[0017] The setting state information holding unit 92 is configured to hold information being related to settings set on the air-conditioning remote controller 5. For example, the setting state information holding unit 92 holds

the operation state information described above in accordance with an operation signal of the operation unit 87. That is, the setting state information holding unit 92 holds a code into which operation state information generated in accordance with an operation signal of the operation unit 87 is encoded.

[0018] The control unit 81 includes the display content generation unit 94. The display content generation unit 94 generates a two-dimensional or three-dimensional image based on the information held in the operation state information holding unit 91 and the setting state information holding unit 92, a comparison result obtained by the comparison unit 96, and display text, display image data, or the like input from the storage unit 89, and supplies the generated image to the display unit 85.

[0019] The control unit 81 includes the comparison unit 96. The comparison unit 96 compares the information held in the operation state information holding unit 91 with the information held in the setting state information holding unit 92 to determine whether or not there are inconsistencies. That is, the comparison unit 96 executes a process for comparing codes held in the operation state information holding unit 91 with codes held in the setting state information holding unit 92.

[0020] The transmitting and receiving unit 83 performs a modulation process on the codes supplied from the control unit 81 to generate transmission signals, and transmits the modulated transmission signals to the indoor unit 11. The transmitting and receiving unit 83 performs a demodulation process on the codes supplied from the transmitting and receiving unit 53 of the indoor unit 11 to generate reception signals, and supplies the demodulated reception signals to the control unit 81.

The display unit 85 is configured to display data stored in the storage unit 89 or display the processing results of the control unit 81.

When any of various operation buttons of the operation unit 87 is pressed, a code corresponding to the operation button is generated. The generated code is supplied to the control unit 81 to perform internal control of the air-conditioning remote controller 5. The details of the various operation buttons will be described below with reference to Fig. 5.

[0021] The storage unit 89 temporarily saves data using, for example, a rewritable RAM (Random Access Memory). The storage unit 89 stores a processing program, parameters, codes corresponding to the various operation buttons, information corresponding to a code acquired from the indoor unit 11, and so forth by using, for example, a read-only ROM (Read Only Memory). That is, the storage unit 89 is constituted by a RAM, a ROM, and the like.

The storage unit 89 includes a code correspondence table 98, which will be described in detail with reference to Fig. 3. The code correspondence table 98 is a table in which a code is linked to various contents corresponding to the code, and will be described in detail with reference to Fig. 3.

The storage unit 89 includes a processing program, various data, and so forth in addition to the code correspondence table 98, which will not be illustrated in the drawings. For example, the storage unit 89 holds various template image data and the like concerning display images, which are used by the display content generation unit 94 to generate various images, various template text data and the like concerning display text, which are used to generate various text, and so forth.

[0022] An example electrical configuration of the indoor unit 11 will be described. The control unit 51 fetches a processing program or the like from the storage unit 54, and executes the processing program or the like in accordance with the frequency of a transmitter (not illustrated) that supplies a constant clock. The control unit 51 controls the air-conditioning apparatus 3 in accordance with a detection value detected by the sensor unit 55. For example, the control unit 51 supplies control instructions to the drive unit 57 to control a compressor, a four-way valve, an outdoor fan, an indoor fan, and an expansion valve.

[0023] The control unit 51 stores operation state information 61, notification information 62, special operation information 63, and so forth in the storage unit 54 while the air-conditioning apparatus 3 is in operation. When causing the transmitting and receiving unit 53 to transmit the operation state information 61, the notification information 62, the special operation information 63, and so forth stored in the storage unit 54 to the air-conditioning remote controller 5, the control unit 51 performs encoding using a code correspondence table 68 stored in the storage unit 54 to obtain codes, and modulates and transmits the codes.

[0024] The transmitting and receiving unit 53 performs a modulation process on the codes supplied from the control unit 51 to generate transmission signals, and transmits the modulated transmission signals to the air-conditioning remote controller 5. The transmitting and receiving unit 53 performs a demodulation process on the codes supplied from the transmitting and receiving unit 83 of the air-conditioning remote controller 5 to generate reception signals, and supplies the demodulated reception signals to the control unit 51.

[0025] The storage unit 54 temporarily saves data using, for example, a rewritable RAM (Random Access Memory). The storage unit 54 stores a processing program, parameters, various codes, and information corresponding to codes acquired from the air-conditioning remote controller 5, and so forth by using, for example, a read-only ROM (Read Only Memory). That is, the storage unit 54 is constituted by a RAM, a ROM, and the like. The storage unit 54 includes a code correspondence table 68, which will be described in detail with reference to Fig. 4. The code correspondence table 68 is a table in which a code is linked to various contents corresponding to the code.

[0026] The sensor unit 55 is formed by, for example, a pyroelectric sensor, a thermopile sensor, a radiation

sensor, a temperature and humidity sensor, a camera, and so forth. The indoor unit 11 performs an operation in a special operation mode or a normal operation mode using detection values detected by the sensor unit 55.

For example, when the sensor unit 55 detects the absence of a person in the room to be air-conditioned by using the thermopile sensor or the like in the special operation mode, the control unit 51 enters an automatic OFF mode. After that, when the sensor unit 55 detects the presence of a person, the control unit 51 enters an automatic ON mode.

[0027] The normal operation mode and the special operation mode will be specifically described. The indoor unit 11 has a normal operation mode and a special operation mode.

The normal operation mode is an operation mode executed when, for example, a scene selection button 87b, described below, is pressed. When the scene in which "whole room heating" is desired is selected, the indoor unit 11 performs control in accordance with the request while performing sensing using the various sensors described above, the details of which will be given later. The normal operation mode also includes other operations such as a cooling operation, a heating operation, a dry (dehumidification) operation, and a fan operation.

In contrast, the special operation mode is an operation mode that is independent of settings on the air-conditioning remote controller 5. For example, while the "automatic ON mode" is being executed by the indoor unit 11, the indoor unit 11 automatically provides a transition of the control state of the indoor unit 11 to the operation ON when detecting the presence of a person in the room as a result of sensing by the various sensors, even though "operation OFF" is set on the air-conditioning remote controller 5, the details of which will be given later.

[0028] The drive unit 57 also controls, for example, the angle of flaps that are blades for adjusting the vertical air direction, the angle of louvers that are blades for adjusting the horizontal air direction, and the like.

[0029] In a case where the operation state information acquired from the air-conditioning remote controller 5 is different from the operation state information 61 held in the indoor unit 11 while the special operation mode is being executed by the control unit 51, the notification unit 58 notifies that the operation state information acquired from the air-conditioning remote controller 5 is different from the operation state information 61 held in the indoor unit 11. For example, the notification unit 58 notifies that the operation state is not normal using sound, light, or the like. Specifically, in a case where the notification unit 58 is constituted by an LED (Light Emitting Diode) as a light-emitting element, the notification unit 58 notifies that the operation state is not normal by causing the LED to flash at certain intervals, for example, every one second.

[0030] In a case where the operation state information acquired from the air-conditioning remote controller 5 is different from the operation state information 61 held in the indoor unit 11, for example, the notification unit 58

may change the interval of flashing of the LED, with respect to the normal state. Specifically, the notification unit 58 may notify the user of the difference by flashing at short flashing intervals. Alternatively, the notification unit 58 may give notification first at short flashing intervals and then by increasing the interval of flashing stepwise. In summary, any method may be used to notify that the state is not normal.

In a case where the notification unit 58 is constituted by a buzzer, the notification unit 58 notifies that the operation state is not normal by causing the buzzer to sound at certain intervals, for example, every two seconds.

The configurations of the notification unit 58 described above are merely examples, and the present invention is not particularly limited thereto.

[0031] Fig. 3 is a diagram illustrating an example of the code correspondence table 98 stored in the storage unit 89 according to Embodiment 1 of the present invention. As illustrated in Fig. 3, the code correspondence table 98 stores special operation information, operation state information, and notification information. Among these pieces of information, information being related to settings on the air-conditioning remote controller 5 is the operation state information. Further, information being related to operations of the indoor unit 11 includes the special operation information, the operation state information, and the notification information.

[0032] The operation state information is information being related to the normal operation mode, more specifically, information being related to normal operations performed when the indoor unit 11 operates in association with the outdoor unit 15. This information is encoded into codes. That is, the operation state information is information being related to operations of the indoor unit 11. As described below, the operation state information includes a code representing the special operation mode. That is, the operation state information has a data structure in which it is possible to determine whether or not the operation mode is the special operation mode by checking the operation state information and in which, if the operation mode is the special operation mode, as described below, the details can be found by checking the special operation information.

[0033] The special operation information is information being related to the special operation mode. As described in the example above, the special operation mode is an operation mode in which the indoor unit 11 automatically executes control in accordance with the detection results of the various sensors, instead of executing control in accordance with a setting set on the air-conditioning remote controller 5, or is an operation mode based on an operation performed using a sub-remote controller 6 described below or the like. The special operation information includes codes into which the information is encoded. Accordingly, the special operation information includes codes that are used when control is performed in accordance with control commands from devices other than the air-conditioning remote controller 5.

[0034] The notification information is proposal information promoting energy conservation against the current operating state of the air-conditioning apparatus 3, and includes codes into which this information is encoded.

[0035] The special operation information has an item in which a code is stored, and a corresponding cause-of-state-inconsistency correspondence table is linked to the code.

The operation state information has items in which a code and code correspondence information corresponding to the code are stored, and a corresponding operation state information correspondence table is linked to the code.

The notification information has an item in which a code is stored, and a corresponding notification correspondence table is linked to the code.

[0036] The cause-of-state-inconsistency correspondence table is a table in which codes are linked to contents corresponding to the codes, that is, the causes of inconsistencies, to which state consistency method information for remedying each of the causes of inconsistencies is further linked.

For example, Code 1 is assigned the automatic ON mode as the cause of inconsistencies, and is linked to Code 1 state consistency method information as remedial measures against the inconsistencies. Further, Code 2 is assigned the automatic OFF mode as the cause of inconsistencies, and is linked to Code 2 state consistency method information as remedial measures against the inconsistencies. Further, Code 3 is assigned an automatic power-saving mode as the cause of inconsistencies, and is linked to Code 3 state consistency method information as remedial measures against the inconsistencies. Further, Code 4 is assigned an automatic control mode as the cause of inconsistencies, and is linked to Code 4 state consistency method information as remedial measures against the inconsistencies. Further, Code 5 is assigned operation on other remote controllers etc. as the cause of inconsistencies, and is linked to Code 5 state consistency method information as remedial measures against the inconsistencies. Further, Code 99 is assigned transmission or reception failure as the cause of inconsistencies, and is linked to Code 99 state consistency method information as remedial measures against the inconsistencies.

[0037] As described below, Codes 1 to 5 correspond to the special operation mode, and Code 99, described above, does not correspond to the special operation mode.

[0038] The automatic ON mode is a mode in which the operation content of the air-conditioning apparatus 3 is automatically started in accordance with a detection value detected by the sensor unit 55 described below. For example, in a case where the sensor unit 55 is provided with a thermopile sensor, it is possible to detect the presence or absence of a person inside the house. Accordingly, the automatic ON mode is a mode in which the operation content of the air-conditioning apparatus 3 is

automatically started in response to a transition from the absence of a person to the presence of a person inside the house.

[0039] The automatic OFF mode is a mode in which the operation content of the air-conditioning apparatus 3 is automatically stopped in accordance with a detection value detected by the sensor unit 55 described below. For example, in a case where the sensor unit 55 is provided with a thermopile sensor, it is possible to detect the presence or absence of a person inside the house. Accordingly, a mode in which the air-conditioning apparatus 3 automatically stops its operation in response to a transition from the presence of a person to the absence of a person inside the house is set as the automatic OFF mode.

[0040] The automatic power-saving mode is a mode in which the operation content of the air-conditioning apparatus 3 is automatically ongoing on the energy conservation side in accordance with a detection value detected by the sensor unit 55 described below. For example, the indoor unit 11 resets the set temperature high for cooling operation, and resets the set temperature low for heating operation. Thus, the air-conditioning operation is controlled on the energy conservation side, that is, in a power-saving manner.

[0041] The automatic control mode is a mode for automatically controlling the individual operation modes, the temperature setting, the fan speed, the air direction, and so forth in accordance with detection values of the room temperature, the feeling temperature for human body, and the like which are detected by the sensor unit 55, described below. For example, in a case where the sensor unit 55 is provided with a radiation sensor or a temperature and humidity sensor, it is possible to detect the room temperature and the feeling temperature for human body. Accordingly, the automatic control mode is a mode in which the individual operation modes, the temperature setting, the fan speed, the air direction, and so forth are automatically controlled in response to the detection of the room temperature and the feeling temperature for human body inside the house.

As described below with reference to Fig. 18, the operation on other remote controllers etc. is an operation in which the operation content of the air-conditioning apparatus 3 is controlled in accordance with control commands based on an operation performed through the sub-remote controller 6, an operation performed using an energy management system 7, which will be described below with reference to Fig. 18, and the like.

[0042] Any of the operations in the automatic ON mode, the automatic OFF mode, the automatic power-saving mode, the automatic control mode, and the operation on other remote controllers etc., described above, corresponds to the special operation mode, and the transmission or reception failure, described subsequently, does not correspond to the special operation mode. The special operation mode described above is an example, and the present invention is not particularly limited

thereto.

[0043] As described below with reference to Fig. 6, the transmission or reception failure corresponds to an inconsistency between the operation state information and the setting state information despite not being in the special operation mode.

The codes used in the foregoing description are examples, and the present invention is not particularly limited thereto.

[0044] The operation state information correspondence table is a table in which codes are linked to contents corresponding to the codes.

For example, Code 101 is assigned the operation ON as the content thereof. Further, Code 102 is assigned the operation OFF as the content thereof. Further, Code 103 is assigned cooling as the content thereof. Further, Code 104 is assigned heating as the content thereof. Further, Code 105 is assigned dry (dehumidification) as the content thereof. Further, Code 106 is assigned fan as the content thereof. Further, Code 107 is assigned the special operation mode as the content thereof. Further, Code 108 is assigned the temperature setting as the content thereof. Further, Code 109 is assigned the humidity setting as the content thereof. Further, Code 110 is assigned the fan speed as the content thereof. Further, Code 111 is assigned the air direction as the content thereof.

[0045] For Codes 103 to 106, code correspondence information in addition to the codes is stored in an item of the operation state information. For example, since Code 103 is assigned a cooling operation, information being related to the temperature setting corresponding to Code 108, information being related to the fan speed corresponding to Code 110, and information being related to the air direction corresponding to Code 111 are stored.

That is, Code 103, Code 108, Code 110, and Code 111 are stored in the item "code", and pieces of information corresponding to the respective codes are stored in the item "code correspondence information" in a mutually distinguishable manner.

Codes 103 to 106 and a code representing laundry (not illustrated) correspond to the normal operation mode.

[0046] The notification correspondence table is a table in which codes are linked to contents corresponding to the codes, to which method information on the respective contents is further linked.

For example, Code a is assigned detection of open window as the content thereof, and is linked to Code a notification method information as the method therefor. Further, Code b is assigned recommendation of power-saving operation as the content thereof, and is linked to Code b notification method information as the method therefor. Further, Code c is assigned recommendation of operation stop as the content thereof, and is linked to Code c notification method information as the method therefor. Further, Code d is assigned optimum operation as the content thereof, and is linked to Code d notification method information as the method therefor. Further, Code e

is assigned failure as the content thereof, and is linked to Code e notification method information as the method therefor.

For no specific codes being set, the content remains blank, and is linked to dummy information as the method therefor.

[0047] Detection of open window is a content of a setting that allows notification that a window or curtain is open. Recommendation of power-saving operation is a content of a setting that allows notification that an operation in a power-saving manner would be better for energy conservation. Recommendation of operation stop is a content of a setting that allows notification of the proposal of stopping of operation. Optimum operation is a content of a setting that allows notification of proposal of an optimum operation. Failure is a content of a setting that allows notification that a failure has probably occurred.

[0048] An example in which each code is linked to a table will be described below with reference to Figs. 7 to 11. In the foregoing description, the description has been given of an example of the code correspondence table 98 concerning settings on the air-conditioning remote controller 5. The code correspondence table 68 concerning operations set in the indoor unit 11 may be formed by, with respect to the code correspondence table 98, removing the respective pieces of code state consistency method information from the cause-of-state-inconsistency correspondence table and removing the respective pieces of code notification method information from the notification correspondence table.

The pieces of information described above may not necessarily be removed. Further, the codes used in the foregoing description are examples, and the present invention is not particularly limited thereto.

[0049] On the basis of the configuration of the code correspondence table 98 described above, for example, when processing a code stored in the setting state information holding unit 92, the air-conditioning remote controller 5 expands the code into the code correspondence table 98, thereby forming a link between the operation state information and the operation state information correspondence table and forming a link between the notification information and the notification correspondence table.

Further, for example, when processing a code stored in the operation state information holding unit 91, the air-conditioning remote controller 5 expands the code into the code correspondence table 98, thereby forming a link between the special operation information and the cause-of-state-inconsistency correspondence table, forming a link between the operation state information and the operation state information correspondence table, and forming a link between the notification information and the notification correspondence table.

[0050] Fig. 4 is a diagram illustrating an example of the code correspondence table 68 stored in the storage unit 54 according to Embodiment 1 of the present invention.

A configuration similar to that of the air-conditioning remote controller 5 will not be described. That is, here, the description will be directed to special operation information and the configuration of a cause-of-state-inconsistency correspondence table linked to the special operation information. As illustrated in Fig. 4, information being related to operations of the indoor unit 11 includes special operation information, operation state information, and notification information.

A code is stored as special operation information, and a corresponding cause-of-state-inconsistency correspondence table is linked to the code.

[0051] The cause-of-state-inconsistency correspondence table is a table in which codes are linked to contents corresponding to the codes, that is, the causes of inconsistencies.

For example, Code 1 is assigned an automatic ON mode as the cause of inconsistencies. Further, Code 2 is assigned an automatic OFF mode as the cause of inconsistencies. Further, Code 3 is assigned an automatic power-saving mode as the cause of inconsistencies. Further, Code 4 is assigned an automatic control mode as the cause of inconsistencies. Further, Code 5 is assigned operation on other remote controllers etc. as the cause of inconsistencies. Further, Code 99 is assigned transmission or reception failure as the cause of inconsistencies.

As described above, Codes 1 to 5 correspond to the special operation mode, and Code 99, described above, does not correspond to the special operation mode.

[0052] The automatic ON mode, the automatic OFF mode, the automatic power-saving mode, the automatic control mode, the operation on other remote controllers etc., and the transmission or reception failure are similar to those described above, and the details thereof will not be described here.

The codes used in the foregoing description are examples, and the present invention is not particularly limited thereto.

[0053] In this manner, the difference between the code correspondence table 68 and the code correspondence table 98 is that the code correspondence table 68 contains no links concerning various pieces of method information. The reason for this is that there is no need to set up a link to various pieces of method information on the indoor unit 11 side. In a configuration in which notification of various methods is given on the indoor unit 11 side, information on the methods is necessary as a matter of course, and is therefore linked.

The storage unit 54 stores the operation state information 61, the notification information 62, and the special operation information 63 when each of them is supplied from the control unit 51.

[0054] Fig. 5 is a diagram illustrating an example configuration of the external appearance of the air-conditioning remote controller 5 according to Embodiment 1 of the present invention. As illustrated in Fig. 5, the air-conditioning remote controller 5 has a substantially rectangular

parallelepiped housing 17 formed of synthetic resin or the like, and includes the transmitting and receiving unit 83, the display unit 85, and the operation unit 87.

The illustration of the thickness of the air-conditioning remote controller 5 is omitted.

[0055] As described above, the transmitting and receiving unit 83 transmits and receives signals and the like indicating the operation content of the indoor unit 11, control commands, and so forth, which are encoded into codes, to and from the indoor unit 11. The transmitting and receiving unit 83 is formed of, for example, an LED configured to transmit infrared signals using the LED as a light-emitting element, and a photodiode configured to receive infrared signals using the photodiode as a light receiving element.

The transmitting and receiving unit 53 incorporated in the indoor unit 11 is also achievable with a similar configuration.

[0056] The display unit 85 is constituted by, for example, a liquid crystal display device or the like, and displays the set temperature, the operation mode, and so forth, which indicate a setting for the air-conditioning apparatus 3, which have been made by the air-conditioning remote controller 5, the operation content of the air-conditioning apparatus 3, and so forth.

After receiving information from the indoor unit 11, the display unit 85 indicates a method for promoting energy conservation in a case where the operation content of the indoor unit 11 and the setting set by the air-conditioning remote controller 5 are consistent.

After receiving information from the indoor unit 11, if there are any inconsistencies between the operation content of the indoor unit 11 and the setting set by the air-conditioning remote controller 5, the display unit 85 displays the occurrence of the inconsistencies, the cause of the inconsistencies, and a method to overcome the inconsistencies.

[0057] An example of the details of the display of a method for promoting energy conservation in a case where the operation content of the indoor unit 11 and the setting set by the air-conditioning remote controller 5 are consistent will be described below with reference to Fig. 8.

An example of the details of display in a case where there are inconsistencies between the operation content of the indoor unit 11 and the setting set by the air-conditioning remote controller 5 will be described below with reference to Figs. 10 and 11.

[0058] The operation unit 87 is constituted by, for example, various operation buttons and so forth, and is an interface that receives instructions such as starting and stopping the operation content of the air-conditioning apparatus 3, changing the operation mode of the air-conditioning apparatus 3, and changing the temperature setting.

Specifically, the operation unit 87 includes an operation ON/OFF button 87a, the scene selection button 87b, an upward pointing triangular button 87c, a downward point-

ing triangular button 87d, a back button 87e, a menu button 87f, an enter button 87g, an information button 87h, a cool button 87i, a dry (dehumidification) button 87j, and a heat button 87k.

[0059] The operation ON/OFF button 87a is an interface that receives operation start and stop instructions for the air-conditioning apparatus 3. When the operation ON/OFF button 87a is pressed while the air-conditioning apparatus 3 is not in operation, the air-conditioning apparatus 3 starts its operation, and an operation mode set by the air-conditioning remote controller 5, a set temperature, and a set humidity are displayed on the display unit 85. When the operation ON/OFF button 87a is pressed while the air-conditioning apparatus 3 is in operation, the air-conditioning apparatus 3 stops the operation.

[0060] The scene selection button 87b is an interface for presenting preset requests that are predictable in list view by operation mode.

For example, if the operation mode is heating, predictable requests, such as "more heat closer to the floor", "rapid heating", "no direct airflow", and "whole room heating", are displayed as selectable options in a list format.

[0061] Further, for example, if the operation mode is cooling, predictable requests, such as "rapid cooling", "no direct airflow", and "cooling with airflow", are displayed as selectable options in a list format. Further, for example, if the operation mode is dry (dehumidification), predictable requests, such as "sterilization and deodorization", "fan only", "circulation of air", and "comfortable sleep", are displayed as selectable options in a list format.

[0062] The upward pointing triangular button 87c is an interface that receives a change to increase the set temperature displayed on the display unit 85. For example, each time the upward pointing triangular button 87c is pressed once, the set temperature is increased by a certain range. Processing for increasing the temperature in steps of, for example, +0.5°C is executed for the air-conditioning apparatus 3. Further, processing for increasing the temperature in steps of, for example, +1°C is executed for the air-conditioning apparatus 3. The ranges of increase in temperature described above are examples, and the present invention is not particularly limited thereto.

The upward pointing triangular button 87c is also used to displace the position of the display content displayed on the display unit 85 or select an item being presented in the display content.

[0063] The downward pointing triangular button 87d is an interface that receives a change to decrease the set temperature displayed on the display unit 85. For example, each time the downward pointing triangular button 87d is pressed once, the set temperature is decreased in a certain range. Processing for decreasing the temperature in steps of, for example, -0.5°C is executed for the air-conditioning apparatus 3. Further, processing for decreasing the temperature in steps of, for example, -1°C is executed for the air-conditioning apparatus 3. The

ranges of decrease in temperature described above are examples, and the present invention is not particularly limited thereto.

The downward pointing triangular button 87d is also used to displace the position of the display content displayed on the display unit 85 or select an item being presented in the display content.

[0064] The back button 87e is an interface that receives processes such as returning the screen currently being displayed on the display unit 85 to the immediately previous screen.

The menu button 87f is an interface that receives the details of the menu settings currently being displayed on the display unit 85.

The enter button 87g is an interface that receives processes such as setting the item currently being displayed on the display unit 85 and checking the operation content of the air-conditioning apparatus 3 while the air-conditioning apparatus 3 is in operation.

The information button 87h is an interface that receives a process for requesting the indoor unit 11 to send information being related to the operation content of the indoor unit 11, which is held in the indoor unit 11. The details of a process performed when the information button 87h is pressed will be described below with reference to Figs. 6 to 11.

[0065] The cool button 87i is an interface that receives a process for requesting the air-conditioning apparatus 3 to perform an operation for a cooling operation mode. The dry button 87j is an interface that receives a process for requesting the air-conditioning apparatus 3 to perform an operation for a dry (dehumidification) operation mode. The heat button 87k is an interface that receives a process for requesting the air-conditioning apparatus 3 to perform an operation for a heating operation mode. The shapes of the various buttons illustrated in Fig. 5 are examples, and the present invention is not particularly limited thereto.

[0066] While in the foregoing description, the description has been given of an example in which the operation unit 87 is constituted by various buttons, the present invention is not particularly limited thereto. For example, in a case where the display unit 85 is constituted by a touch panel display, the operation unit 87 may be formed on the display unit 85.

In a case where the air-conditioning remote controller 5 is provided with a voice recognition processing unit, the voice recognition processing unit may have the function corresponding to the operation unit 87. For example, when a user utters voice like "Operation ON", the voice recognition processing unit may parse the voice made by the user, and perform control in accordance with the result of parse. Specifically, the voice may be divided into the words "Operation" and "ON", and the meanings of the words may be linked together.

Further, in a case where the air-conditioning remote controller 5 is provided with an imaging unit having a motion capture function, any of the various buttons of the oper-

ation unit 87 may be specified in accordance with tracking of the eye movement using the imaging unit. For example, if the eye movement stops at the "upward pointing triangular button 87c", the upward pointing triangular button 87c may be regarded as having been specified and processing may be performed.

[0067] The external appearance configuration of the air-conditioning remote controller 5 described above is an example, and the present invention is not particularly limited thereto. For example, each of the various buttons may have a substantially rectangular parallelepiped shape.

[0068] Fig. 6 is a flowchart depicting an example of control performed by the control unit 51 and the control unit 81 according to Embodiment 1 of the present invention. Referring to Fig. 6, processing in which the processes of the control unit 51 and the processes of the control unit 81 are associated together will be described. Thus, the step numbers are not in order. Specifically, the description will be directed to the state where the processes of the control unit 51 are nested within the processes of the control unit 81.

The example of control performed by the control unit 81 will be described by referring to the processes of steps S101 to S110, and the example of control performed by the control unit 51 will be described by referring to the processes of steps S201 to S206.

That is, the processing on the air-conditioning remote controller 5 side will be described by referring to steps S101 to S110, and the processing on the indoor unit 11 side will be described by referring to steps S201 to S206. The processes described below are implemented by associating the air-conditioning remote controller 5 and the indoor unit 11 with each other, or may be implemented by direct association between the air-conditioning remote controller 5 and the outdoor unit 15.

(Step S101)

[0069] The control unit 81 determines whether or not the information button 87h has been pressed. If the information button 87h illustrated in Fig. 5 has been pressed, the control unit 81 proceeds to step S102. If the information button 87h illustrated in Fig. 5 is not pressed, the control unit 81 returns to step S101.

(Step S102)

[0070] The control unit 81 transmits an information acquisition request to the indoor unit 11. For example, the control unit 81 causes the transmitting and receiving unit 83 to transmit a request that the indoor unit 11 supply, as information being related to operations of the indoor unit 11, operation state information, notification information, and special operation information to the air-conditioning remote controller 5.

[0071] Hereafter, the processes on the indoor unit 11 side will be described with reference to steps S201 to

S206.

(Step S201)

[0072] The control unit 51 determines whether or not an information acquisition request has been received. If an information acquisition request has been received, the control unit 51 proceeds to step S202. If an information acquisition request is not received, the control unit 51 returns to step S201.

(Step S202)

[0073] The control unit 51 determines whether or not the special operation mode is in progress. If the operation mode is not the special operation mode the control unit 51 proceeds to step S203. On the other hand, if the special operation mode is in progress, the control unit 51 proceeds to step S205.

(Step S203)

[0074] The control unit 51 acquires operation state information. For example, if the operation content of the indoor unit 11 is cooling, the control unit 51 acquires a code corresponding thereto, a code related to the code, and code correspondence information on the codes.

[0075] Specifically, as described below with reference to Fig. 7, Code 103 is a code corresponding to cooling. If the operation content of the indoor unit 11 is cooling, the related codes are codes concerning the temperature setting, the humidity setting, the fan speed, and the air direction. Further, the code correspondence information is information corresponding to the set temperature value, the set humidity value, the set fan speed, and the set air direction.

More specifically, the control unit 51 acquires Code 103, Code 108, Code 109, Code 110, and Code 111 as codes. The control unit 51 also acquires encoded information corresponding to, for example, a set temperature value of 27.5°C, a set humidity value of 50%, the fan speed set high, and the air direction set downward. For example, digits are assigned to the set temperature value, the set humidity value, the set fan speed, and the set air direction, and an encoded hexadecimal representation thereof may be used. The encoded representation may be combined and transmitted once as a single unit. Alternatively, the encoded representation may be divided into portions by certain size before being transmitted, and the divided portions may be combined into a single unit on the receiver side.

(Step S204)

[0076] The control unit 51 acquires notification information. For example, if the operation content of the indoor unit 11 is cooling, the control unit 51 detects factors in the inhibition of cooling by using the sensor unit 55, and

acquires codes corresponding to the detection results. For example, if a warm place is found inside the house, the control unit 51 determines that a window is open, and acquires Code a.

(Step S205)

[0077] The control unit 51 acquires special operation information. For example, if the operation state information indicates Code 107, the control unit 51 is in the special operation mode. In this case, the control unit 51 acquires a code for special operation information. For example, if the special operation mode is being performed in the automatic ON mode, the control unit 51 acquires Code 1.

(Step S206)

[0078] The control unit 51 transmits the acquired information. The control unit 51 transmits, as information being related to the operation content of the indoor unit 11, a combination of codes among, for example, a code for special operation information, a code for operation state information, and a code for notification information, and then proceeds to step S103.

That is, a combination of codes among the code for special operation information, the code for operation state information, and the code for notification information corresponds to "first information" according to the present invention.

Then, the processing returns to step S103.

(Step S103)

[0079] The control unit 81 receives the acquired information. The control unit 81 holds the code concerning operation state information, which is included in the received information, in the operation state information holding unit 91, and stores the other information in the storage unit 89.

(Step S104)

[0080] The control unit 81 determines whether or not the operation state information and the setting state information are consistent. If the operation state information and the setting state information are consistent, the control unit 81 proceeds to step S105. If the operation state information and the setting state information are not consistent, the control unit 81 proceeds to step S106. Such a consistency determination process is executed by the comparison unit 96 included in the control unit 81, and the display content generation unit 94 generates an image to be displayed on the display unit 85, in accordance with the comparison result.

[0081] A process in the case where the operation state information and the setting state information are consistent (YES in step S104) corresponds to a process

in a case where the operation mode is not the special operation mode. The details of the code correspondence table 98 in this case will now be described with reference to Fig. 7.

[0082] Fig. 7 is a diagram illustrating an example of the code correspondence table 98, which is stored in the storage unit 89 in a case where the operation mode is not the special operation mode according to Embodiment 1 of the present invention.

First, the control unit 81 expands a code concerning operation state information, which is held in the operation state information holding unit 91, onto the code correspondence table 98. Further, it is assumed as a premise that the content of a setting set by a user operating the operation unit 87, that is, a code concerning setting state information, is held in the setting state information holding unit 92.

[0083] A consistency between the operation state information and the setting state information corresponds to a coincidence between the codes of both. As illustrated in Fig. 7, the codes obtained in this case are Codes 103, 108, 109, 110, and 110. Further, Code a is expanded into the notification information. Detection of open window is set as the content corresponding to Code a, and is linked to Code a notification method information as method information related thereto.

[0084] On the other hand, a process in the case where the operation state information and the setting state information are not consistent (NO in step S104) corresponds to a process in a case where the operation mode is in the special operation mode. The details of the code correspondence table 98 in this case will be described after step S106 with reference to Fig. 9.

(Step S105)

[0085] The control unit 81 generates display content from the received information. An example of the display content will be described with reference to Fig. 8. Fig. 8 is a diagram illustrating an example of display on the air-conditioning remote controller 5 according to Embodiment 1 of the present invention in a case where the operation state information and the setting state information are consistent.

As illustrated in Fig. 8, the display unit 85 displays a display text or a display image indicating content such as "There is a warm place on the wall", "Is any curtain or door open?", and "Energy will be saved if you close it". These pieces of content are created by the display content generation unit 94 described with reference to Fig. 3 in accordance with the Code a notification method information described with reference to Fig. 7.

(Step S106) to (Step S108)

[0086] The processes of step S106 to step S108 will now be described, if necessary, with reference to Fig. 8. That is, the description will be directed to the details of

the code correspondence table 98 in a case where the indoor unit 11 is in the special operation mode. Fig. 9 is a diagram illustrating an example of the code correspondence table 98, which is stored in the storage unit 89 in a case where the mode is the special operation mode, according to Embodiment 1 of the present invention.

[0087] The control unit 81 acquires inconsistency state information in accordance with the received information. Specifically, first, the control unit 81 determines whether or not the code concerning operation state information is that for the special operation mode, that is, Code 107. If the code concerning operation state information is not Code 107, the control unit 81 acquires, as inconsistency state information, Code 99 as a code corresponding thereto from the cause-of-state-inconsistency correspondence table. That is, an inconsistency between the operation state information and the setting state information in spite of being in the special operation mode corresponds to a failure of transmission and reception of information between the air-conditioning remote controller 5 and the indoor unit 11. Thus, the control unit 81 acquires Code 99, which is the code corresponding to the transmission or reception failure (steps S106 to S108).

[0088] If the codes concerning operation state information include Code 107, the control unit 81 refers to the code concerning special operation information, and acquires inconsistency state information. For example, as illustrated in Fig. 9, if the code concerning special operation information is Code 1, the inconsistency state information is Code 1 (step S106).

Then, the control unit 81 acquires cause information about the cause of inconsistencies in accordance with the inconsistency state information. Since the inconsistency state information is Code 1, the content corresponding thereto, that is, the "automatic ON mode", is acquired as the cause of inconsistencies (step S107).

Then, the control unit 81 acquires state consistency method information from the cause information. Here, the cause information is the "automatic ON mode". Thus, the control unit 81 acquires the "Code 1 state consistency method information" as the corresponding method information (step S108).

(Step S109)

[0089] The control unit 81 generates display content in accordance with the inconsistency state information, the cause information, and the state consistency method information.

For example, the display content generation unit 94 included in the control unit 81 generates a method for making the operation state information and the setting state information consistent in accordance with the Code 1 state consistency method information. That is, the display content generation unit 94 generates a screen of a method for making the operation content of the indoor unit 11 and the settings set on the air-conditioning remote con-

troller 5 consistent.

(Step S110)

[0090] The control unit 81 causes the display unit 85 to display the display content generated by the display content generation unit 94, and then terminates the process.

An example of the display content will now be described with reference to Figs. 10 and 11. Fig. 10 is a diagram illustrating an example of display on the air-conditioning remote controller 5 according to Embodiment 1 of the present invention in a case where the operation state information and the setting state information are not consistent. Fig. 11 is a diagram illustrating another example of display on the air-conditioning remote controller 5 according to Embodiment 1 of the present invention in a case where the operation state information and the setting state information are not consistent.

[0091] As illustrated in Fig. 10, a display item 85a, a display item 85b, and a display item 85c are displayed on the display unit 85.

The display item 85a indicates the cause of inconsistencies between the operation content of the indoor unit 11 and the settings on the air-conditioning remote controller 5, such as "The main body is operating in the automatic ON mode".

The display item 85b indicates presence of inconsistencies between the operation content of the indoor unit 11 and the settings on the air-conditioning remote controller 5, such as "The operation content of the main body and the settings on the remote control are not consistent".

The display item 85c indicates a method for making the operation content of the indoor unit 11 and the settings on the air-conditioning remote controller 5 consistent, such as "Press [Operation ON/OFF] to make the settings consistent with the operation content of the main body" in a case where there are inconsistencies.

[0092] As illustrated in Fig. 10, in a case where the indoor unit 11 is in the automatic ON mode, which is a special operation mode, the setting on the air-conditioning remote controller 5 is generally the operation OFF. In the example illustrated in Fig. 10, therefore, pressing of the operation ON/OFF button 87a is presented as a method for making the operation content of the indoor unit 11 and the setting on the air-conditioning remote controller 5 consistent.

Further, in a case where both operation modes are simply different, such as the case where the operation mode for the operation content of the indoor unit 11 is heating and the operation mode set on the air-conditioning remote controller 5 is cooling, a method for pressing the heat button 87k may be displayed so as to match the operation content of the indoor unit 11, namely, heating.

[0093] Then, as illustrated in Fig. 11, a display item 85a, a display item 85b, and a display item 85c are displayed on the display unit 85.

The display item 85a displays the cause of inconsisten-

cies between the operation content of the indoor unit 11 and the settings on the air-conditioning remote controller 5, such as "The main body is operating in the special function mode".

5 The display item 85b indicates presence of inconsistencies between the operation content of the indoor unit 11 and the settings on the air-conditioning remote controller 5, such as "The operation content of the main body and the settings on the remote control are not consistent".

10 The display item 85c indicates a method for making the operation content of the indoor unit 11 and the settings on the air-conditioning remote controller 5 consistent in a case where there are inconsistencies, such as "Which setting do you wish to make the state match, Main body [Enter] or Remote control [Back]?".

15 **[0094]** When the enter button 87g is pressed in accordance with the method illustrated in Fig. 11, in the air-conditioning remote controller 5, the code concerning operation state information, which is held in the setting state information holding unit 92, is overwritten and updated with the code concerning operation state information, which is held in the operation state information holding unit 91. Then, the display content generation unit 94 generates a display text or a display image to be displayed, in accordance with the overwritten and updated results, and the overwritten and updated content of the operation is displayed by the display unit 85.

In this case, the transmitting and receiving unit 83 may transmit a code concerning the operation state information, which is held in the air-conditioning remote controller 5, to the indoor unit 11. That is, the transmitting and receiving unit 83 may perform a process for holding in the air-conditioning remote controller 5 the operation state information acquired from the indoor unit 11 and transmitting the operation state information again to the indoor unit 11.

30 **[0095]** In contrast, when the back button 87e is pressed in accordance with the method illustrated in Fig. 11, the air-conditioning remote controller 5 transmits a code concerning the operation state information, which is held in the setting state information holding unit 92, to the indoor unit 11 via the transmitting and receiving unit 83. In this case, the indoor unit 11 overwrites and updates the operation state information thereon, that is, the operation state information on the indoor unit 11, with the settings on the air-conditioning remote controller 5.

35 **[0096]** In the foregoing description, the description has been given of an example in which indication of inconsistencies between the operation content of the indoor unit 11 and the settings on the air-conditioning remote controller 5, the cause of inconsistencies between the operation content of the indoor unit 11 and the settings on the air-conditioning remote controller 5, and a method for making the operation content of the indoor unit 11 and the settings on the air-conditioning remote controller 5 consistent if there are inconsistencies, are simultaneously displayed on a single screen. However, the present invention is not particularly limited thereto.

[0097] For example, indication of inconsistencies between the operation content of the indoor unit 11 and the settings on the air-conditioning remote controller 5, the cause of inconsistencies between the operation content of the indoor unit 11 and the settings on the air-conditioning remote controller 5, and a method for making the operation content of the indoor unit 11 and the settings on the air-conditioning remote controller 5 consistent if there are inconsistencies may be displayed in separate portions.

[0098] Fig. 12 is a diagram illustrating a first example of separate display on the air-conditioning remote controller 5 according to Embodiment 1 of the present invention in a case where the operation state information and the setting state information are not consistent. Fig. 13 is a diagram illustrating a second example of separate display on the air-conditioning remote controller 5 according to Embodiment 1 of the present invention in a case where the operation state information and the setting state information are not consistent. Fig. 14 is a diagram illustrating a third example of separate display on the air-conditioning remote controller 5 according to Embodiment 1 of the present invention in a case where the operation state information and the setting state information are not consistent.

[0099] Specifically, indication of inconsistencies between the operation content of the indoor unit 11 and the settings on the air-conditioning remote controller 5, the cause of inconsistencies between the operation content of the indoor unit 11 and the settings on the air-conditioning remote controller 5, and a method for making the operation content of the indoor unit 11 and the settings on the air-conditioning remote controller 5 consistent if there are inconsistencies, may be displayed in order on a screen-by-screen basis in the manner illustrated in Figs. 12 to 14. That is, the content to be displayed on the display unit 85 may be divided into portions, and the portions may be automatically displayed in order at certain time intervals, or may be displayed in order by scrolling through the portions. Furthermore, in a case where items are to be displayed on a screen-by-screen basis in the manner described above, screens may be switched using the upward pointing triangular button 87c, the downward pointing triangular button 87d, the enter button 87g, and the like.

The order in which the indication of inconsistencies between the operation content of the indoor unit 11 and the settings on the air-conditioning remote controller 5, the cause of inconsistencies between the operation content of the indoor unit 11 and the settings on the air-conditioning remote controller 5, and a method for making the operation content of the indoor unit 11 and the settings on the air-conditioning remote controller 5 consistent if there are inconsistencies, are to be displayed is not particularly limited.

[0100] Next, an example in which a dedicated button for making one of the operation content of the indoor unit 11 and the settings on the air-conditioning remote con-

troller 5 consistent with the other if there are inconsistencies is provided will be described with reference to Fig. 15.

Fig. 15 is a diagram illustrating another example configuration of the external appearance of the air-conditioning remote controller 5 according to Embodiment 1 of the present invention.

[0101] As illustrated in Fig. 15, a display item 85a, a display item 85b, and a display item 85c are displayed on the display unit 85.

The display item 85a displays the cause of inconsistencies between the operation content of the indoor unit 11 and the settings on the air-conditioning remote controller 5, such as "The main body is operating in the special function mode".

The display item 85b indicates presence of inconsistencies between the operation content of the indoor unit 11 and the settings on the air-conditioning remote controller 5, such as "The operation content of the main body and the settings on the remote control are not consistent".

The display item 85c indicates a method for making the operation content of the indoor unit 11 and the settings on the air-conditioning remote controller 5 consistent if there are inconsistencies, such as "Which setting do you wish to make the state match, [Main body] or [Remote control]?".

[0102] When a main body button 87n is pressed in accordance with the method illustrated in Fig. 15, in the air-conditioning remote controller 5, the code concerning the operation state information, which is held in the setting state information holding unit 92, is overwritten and updated with the code concerning the operation state information, which is held in the operation state information holding unit 91. Then, the display content generation unit 94 generates a display text or a display image to be displayed, in accordance with the overwritten and updated results, and the overwritten and updated content of the operation is displayed by the display unit 85.

In this case, the transmitting and receiving unit 83 may transmit a code concerning the operation state information, which is held in the air-conditioning remote controller 5, to the indoor unit 11. That is, the transmitting and receiving unit 83 may perform a process for holding in the air-conditioning remote controller 5 the operation state information acquired from the indoor unit 11 and transmitting the operation state information again to the indoor unit 11.

[0103] In contrast, when a remote control button 87m is pressed in accordance with the method illustrated in Fig. 15, the air-conditioning remote controller 5 transmits a code concerning operation state information, which is held in the setting state information holding unit 92, to the indoor unit 11 via the transmitting and receiving unit 83. In this case, the indoor unit 11 overwrites and updates the operation state information thereon with the content of the operation set on the air-conditioning remote controller 5.

In the foregoing description, the description has been

given of an example in which a display text or a display image is generated as display content. However, the present invention is not particularly limited thereto. For example, in a case where the air-conditioning remote controller 5 is provided with a voice output unit, notification may be given by reproducing voice synthesis information stored in advance. In a case where the air-conditioning remote controller 5 is also provided with a voice input unit, notification may be given by creating desired voice information by a user, inputting the voice information, and outputting the input voice information.

A display text is formed of, for example, font data of characters and the like, and a display image is formed of, for example, a raster image or a vector image. Furthermore, in a case where the air-conditioning remote controller 5 is provided with an Internet connection interface, desired text, images, moving images, audio, and the like may be downloaded, as necessary, and notification may be given by using them.

[0104] The main body button 87n corresponds to a "first-information-side consistency button" according to the present invention.

Further, the remote control button 87m corresponds to a "second-information-side consistency button" according to the present invention.

[0105] In this manner, it is possible to present inconsistencies between the operation and the settings, the cause of the inconsistencies between the operation and the settings, and a method for correcting the inconsistencies between the operation and the settings to provide a consistent state. Therefore, it is possible to improve usability and convenience.

[0106] In other words, the air-conditioning remote controller 5 mutually communicates with the air-conditioning apparatus 3, compares the operation content of the air-conditioning apparatus 3 with the settings on the air-conditioning remote controller 5, and gives notification of inconsistencies between the operation and the settings if inconsistencies have been found as a result of the comparison. Accordingly, in a case where there are inconsistencies between the operation content of the air-conditioning apparatus 3 and the settings on the air-conditioning remote controller 5 in the special operation mode, it is possible to notify a user of the inconsistencies between the settings and the operation, the cause of the inconsistencies, and a method for correcting the inconsistencies to provide a consistent state. Therefore, it is possible to improve usability and convenience.

[0107] As described above, in Embodiment 1, an air-conditioning remote controller for transmitting a control command to an indoor unit includes a transmitting and receiving unit that receives an operation content of the indoor unit, a control unit that compares the operation content of the indoor unit with a setting on the air-conditioning remote controller, and a display unit that displays display content based on a comparison result obtained by the control unit. The control unit causes the display unit to give notification of presence of an inconsistency

between the operation content of the indoor unit and the setting on the air-conditioning remote controller and at least one of a cause of the inconsistency and a method for making the operation content of the indoor unit and the setting on the air-conditioning remote controller consistent in a case where inconsistency is present between the operation content of the indoor unit and the setting on the air-conditioning remote controller in a special operation mode in which the indoor unit performs determination and performs operation. This allows a user to be notified of any inconsistencies between the operation content of the air-conditioning apparatus 3 and settings on the air-conditioning remote controller 5 if there are inconsistencies between the operation and the settings, the cause of the inconsistencies, and a method for correcting the inconsistencies to provide a consistent state. Therefore, it is possible to improve usability and convenience.

Embodiment 2.

[0108] The difference between Embodiment 2 and Embodiment 1 is that information, which is acquired using the information button 87h, is acquired using any other button without using the information button 87h.

In Embodiment 2, items are similar to those in Embodiment 1 unless otherwise specifically stated, and the same functions and configurations will be described using the same numerals.

Furthermore, the descriptions of configurations, functions, and operations similar to those in Embodiment 1 are omitted.

[0109] Fig. 16 is a block diagram illustrating example electrical configuration of an indoor unit 11 and an air-conditioning remote controller 5 according to Embodiment 2 of the present invention.

As illustrated in Fig. 16, the control unit 51 includes an operation state information holding unit 101, a setting state information holding unit 102, and a comparison unit 106.

The configuration and function of the operation state information holding unit 101 are similar to those of the operation state information holding unit 91, and a description thereof is omitted.

Further, the configuration and function of the setting state information holding unit 102 are similar to those of the setting state information holding unit 92, and a description thereof is omitted.

It is to be noted that the setting state information holding unit 102 stores codes relating to the setting state information holding unit 92, and the operation state information holding unit 101 stores codes relating to the content of the operation content of the indoor unit 11.

In this case, the control unit 51 stores various pieces of information stored in the storage unit 54 in the operation state information holding unit 101 and the setting state information holding unit 102, if necessary.

Further, the configuration and function of the comparison

unit 106 are similar to those of the comparison unit 96, and a description thereof is omitted.

[0110] Fig. 17 is a flowchart depicting an example of control performed by the control unit 51 and the control unit 81 according to Embodiment 2 of the present invention.

The processes of difference will be described here, and a description of the other processes is omitted.

(Step S501)

[0111] The control unit 81 determines whether or not, for example, the upward pointing triangular button 87c has been pressed. If the upward pointing triangular button 87c has been pressed, the control unit 81 proceeds to step S502. If the upward pointing triangular button 87c is not pressed, the control unit 81 returns to step S501. In the foregoing description, the description has been given of the case where the upward pointing triangular button 87c has been pressed. However, the present invention is not particularly limited thereto, and any other button may be used. That is, a button other than the information button 87h, the remote control button 87m, and the main body button 87n may be pressed.

The operation described above may be performed regardless of whether the air-conditioning apparatus 3 is in operation or not.

(Step S502)

[0112] The control unit 81 transmits a code concerning setting state information to the indoor unit 11.

[0113] Next, the processes of steps S601 to S605 will be described, and a description of the processes of steps S503 to S510 is omitted.

(Step S601)

[0114] The control unit 51 determines whether or not setting state information has been received. If setting state information has been received, the control unit 51 proceeds to step S602. If setting state information is not received, the control unit 51 returns to step S601.

(Step S602)

[0115] The control unit 51 determines whether or not the operation mode is the special operation mode. If the operation mode is not the special operation mode the control unit 51 proceeds to step S603. If the operation mode is the special operation mode, the control unit 51 proceeds to step S606.

(Step S603)

[0116] The control unit 51 reflects the setting state information. Specifically, the control unit 51 overwrites and updates the code concerning setting state information,

which has been received from the air-conditioning remote controller 5, with the code concerning the content of the operation content of the indoor unit 11, which is stored in the operation state information holding unit 101.

(Step S604)

[0117] The control unit 51 acquires the operation state information stored in the operation state information holding unit 101, that is, a code concerning the content of the operation content of the indoor unit 11, which is stored in the operation state information holding unit 101.

(Step S605)

[0118] The control unit 51 transmits the acquired information to the air-conditioning remote controller 5.

(Step S606)

[0119] The control unit 51 determines whether or not the operation state information and the setting state information are consistent or whether there is an inconsistency that does not affect the special operation state. If the operation state information and the setting state information are consistent or there is an inconsistency that does not affect the special operation state, the control unit 51 proceeds to step S603. If the operation state information and the setting state information are not consistent or there is an inconsistency that affects the special operation state, the control unit 51 proceeds to step S607.

(Step S607)

[0120] The control unit 51 acquires inconsistency state information, and proceeds to step S604.

[0121] In the manner described above, it is possible to acquire information, which is obtained using the information button 87h, using any other button in a similar manner without using the information button 87h. Therefore, it is possible to improve usability and convenience.

Embodiment 3.

[0122] In Embodiment 3, the difference from Embodiments 1 and 2 is that the operation content of the indoor unit 11 is changed by a device other than the air-conditioning remote controller 5.

In Embodiment 3, items are similar to those in Embodiments 1 and 2 unless otherwise specifically stated, and the same functions and configurations will be described using the same numerals.

Furthermore, the descriptions of configurations, functions, and operations similar to those in Embodiments 1 and 2 are omitted.

[0123] Fig. 18 is a diagram illustrating a schematic configuration of an air-conditioning system 1 according to

Embodiment 3 of the present invention. As illustrated in Fig. 18, the indoor unit 11 communicates with a sub-remote controller 6 via a communication medium. The indoor unit 11 communicates with an energy management system 7 via an IP network 10.

[0124] The indoor unit 11 is connected to the outdoor unit 15 through various pipes, signal lines, or the like. The indoor unit 11 and the outdoor unit 15, that is, the air-conditioning apparatus 3, perform air conditioning in accordance with a control command supplied from one of the air-conditioning remote controller 5, the sub-remote controller 6, and the energy management system 7, by changing the pressure of the refrigerant flowing through the refrigerant pipes and by the removal of heat or the transfer of heat from the refrigerant. The indoor unit 11 mutually communicates with the air-conditioning remote controller 5, the sub-remote controller 6, the energy management system 7, and so forth, thereby transmitting and receiving information being related to the operation content of the indoor unit 11 in the air-conditioning apparatus 3 and the like.

The sub-remote controller 6 has the same configuration and function as those of the air-conditioning remote controller 5, and is utilized as an auxiliary controller.

[0125] The energy management system 7 is configured to display the amount of power consumption of household electrical appliances at home or remotely control the operation content of the household electrical appliances. For example, the so-called HEMS (Home Energy Management System) is currently being introduced into homes.

As the energy management system 7, systems other than that described above, such as BEMS (Building and Energy Management System), FEMS (Factory Energy Management System), and CEMS (Cluster/Community Energy Management System), are introduced, as necessary.

In the foregoing description, the description has been given of an example in which the IP network 10 is used as a communication medium between the energy management system 7 and the indoor unit 11. However, the present invention is not particularly limited thereto. Although not illustrated in the drawings, the indoor unit 11 may communicate with the energy management system 7 via, for example, a telephone line. Further, the IP network 10 may be an IP network 10 based on wired communication, an IP network 10 based on wireless communication, or an IP network 10 based on optical communication.

[0126] On the basis of the configuration described above, the indoor unit 11 is capable of receiving a control command from a device other than the air-conditioning remote controller 5. For example, in a case where the sub-remote controller 6 transmits a control command to the indoor unit 11, the indoor unit 11 changes the operation in accordance with the control command. For example, in a case where the energy management system 7 transmits a control command to the indoor unit 11, the

indoor unit 11 changes the operation in accordance with the control command.

[0127] In this manner, even if the operation content of the indoor unit 11 is changed from the outside, the aforementioned processes described in Embodiments 1 and 2 are executed, thereby allowing the air-conditioning remote controller 5 to give notification of inconsistencies, the cause of the inconsistencies, and a method for correcting the inconsistencies to provide a consistent state by using the display unit 85.

Therefore, it is possible to improve usability and convenience.

[Reference Signs List]

[0128] 1 air-conditioning system, 3 air-conditioning apparatus, 5 air-conditioning remote controller, 6 sub-remote controller, 7 energy management system, 10 IP network, 11 indoor unit, 15 outdoor unit, 17 housing, 51 control unit, 53 transmitting and receiving unit, 54 storage unit, 55 sensor unit, 57 drive unit, 58 notification unit, 61 operation state information, 62 notification information, 63 special operation information, 68 code correspondence table, 81 control unit, 83 transmitting and receiving unit, 85 display unit, 85a to 85c display item, 87 operation unit, 87a operation ON/OFF button, 87b scene selection button, 87c upward pointing triangular button, 87d downward pointing triangular button, 87e back button, 87f menu button, 87g enter button, 87h information button, 87i cool button, 87j dry button, 87k heat button, 87m remote control button, 87n main body button, 89 storage unit, 91 operation state information holding unit, 92 setting state information holding unit, 94 display content generation unit, 96 comparison unit, 98 code correspondence table, 101 operation state information holding unit, 102 setting state information holding unit, 106 comparison unit.

Claims

1. An air-conditioning remote controller (5) comprising:

a transmitting and receiving unit (83) that transmits a control command to an indoor unit (11) and receives an operation content of the indoor unit (11);

a control unit (81) that compares the operation content of the indoor unit (11) with a setting on the air-conditioning remote controller (5); and
a display unit (85) that displays display content based on a comparison result obtained by the control unit (81), wherein

the control unit (81) causes the display unit (85) to give notification of presence of an inconsistency between the operation content of the indoor unit (11) and the setting on the air-conditioning remote controller (5) and at least one of

- a cause of the inconsistency and a method for making the operation content of the indoor unit (11) and the setting on the air-conditioning remote controller (5) consistent in a case where inconsistency is present between the operation content of the indoor unit (11) and the setting on the air-conditioning remote controller (5) in a special operation mode in which the indoor unit (11) performs determination and performs operation.
2. The air-conditioning remote controller (5) of Claim 1, further comprising an information acquisition button (87h) used to acquire the operation content of the indoor unit (11) by using the transmitting and receiving unit (83), wherein the control unit (81) includes an operation state information holding unit (91) that holds first information being related to the operation content of the indoor unit (11) supplied from the transmitting and receiving unit (83), and the control unit (81) holds the first information in the operation state information holding unit (91) when the information acquisition button is operated (87h).
 3. The air-conditioning remote controller (5) of Claim 1, further comprising a plurality of operation buttons used for inputting, by button operation, the operation content of the indoor unit (11), wherein the control unit (81) includes an operation state information holding unit (91) that holds first information being related to the operation content of the indoor unit (11) supplied from the transmitting and receiving unit (83), and the control unit (81) holds the first information in the operation state information holding unit (91) when one of the plurality of operation buttons is operated.
 4. The air-conditioning remote controller (5) of Claim 2 or 3, wherein the control unit (81) includes a setting state information holding unit (92) that holds second information being related to the setting on the air-conditioning remote controller (5), the second information being generated based on the setting on the air-conditioning remote controller (5), a comparison unit (96) that compares the first information with the second information to determine whether or not inconsistency is present between the first information and the second information, and a display content generation unit (94) that generates the display content in accordance with a comparison result obtained by the comparison unit (96), the display content including one or both of a display text and a display image.
 5. The air-conditioning remote controller (5) of Claim 4, wherein the comparison unit (96) compares the first information including information being related to at least one of being operating, stopping of operation, an operation mode including a normal operation mode and the special operation mode, a set temperature, a set humidity, a fan speed, and an air direction, with the second information including information being related to at least one of the being operating, the stopping of operation, the operation mode, the set temperature, the set humidity, the fan speed, and the air direction.
 6. The air-conditioning remote controller (5) of Claim 5, wherein the display content generation unit (94) generates display content concerning presence of an inconsistency between the first information and the second information, a cause of an inconsistency between the first information and the second information, and a method for making the first information and the second information consistent in a case where inconsistency is present between the first information and the second information.
 7. The air-conditioning remote controller (5) of Claim 6, wherein the control unit (81) simultaneously makes the presence of inconsistency, the cause of the inconsistency, and the method for making the first information and the second information consistent be displayed on a single screen.
 8. The air-conditioning remote controller (5) of Claim 6, wherein the control unit (81) makes the presence of inconsistency, the cause of the inconsistency, and the method for making the first information and the second information consistent be displayed in order on a screen-by-screen basis.
 9. The air-conditioning remote controller (5) of Claim 8, wherein the control unit (81) makes the presence of inconsistency, the cause of the inconsistency, and the method for making the first information and the second information consistent be displayed in order upon elapse of a preset time period or when one of the information acquisition button (87h) is operated and the plurality of operation buttons.
 10. The air-conditioning remote controller (5) of Claim 9, wherein the indoor unit (11) includes a sensor unit (55) that detects presence or absence of a person, and the control unit (81) links the cause of the inconsistency to the special operation mode from among a plurality of pieces of cause information, the plurality of pieces of cause information being set in advance, the special operation mode being performed in an automatic ON mode that allows automatic start in response to the detection of the presence of a person by the sensor unit (55).

11. The air-conditioning remote controller (5) of Claim 9, wherein the indoor unit (11) includes a sensor unit (55) that detects presence or absence of a person, and
the control unit (81) links the cause of the inconsistency to the special operation mode from among a plurality of pieces of cause information, the plurality of pieces of cause information being set in advance, the special operation mode being performed in an automatic OFF mode that allows automatic stop in response to the detection of the absence of a person by the sensor unit (55). 5 10
12. The air-conditioning remote controller (5) of Claim 9, wherein the indoor unit (11) includes a sensor unit (55) that detects presence or absence of a person or detects an amount of activity of a person, and the control unit (81) links the cause of the inconsistency to the special operation mode from among a plurality of pieces of cause information, the plurality of pieces of cause information being set in advance, the special operation mode being performed in an automatic power-saving mode that allows an operation to be automatically performed in a power-saving manner in response to the detection of the presence of a person or a reduction in the amount of activity of a person by the sensor unit (55). 15 20 25
13. The air-conditioning remote controller (5) of Claim 9, wherein the indoor unit (11) includes a sensor unit (55) that detects a room temperature or a feeling temperature for human body, and
the control unit (81) links the cause of the inconsistency to the special operation mode from among a plurality of pieces of cause information, the plurality of pieces of cause information being set in advance, the special operation mode being performed in an automatic control mode for controlling the operation mode, the set temperature of the indoor unit (11), and the fan speed and air direction of the indoor unit (11) in response to the detection of the room temperature or the feeling temperature for human body by the sensor unit (55). 30 35 40
14. The air-conditioning remote controller (5) of Claim 9, wherein the indoor unit (11) includes a transmitting and receiving unit (53) that transmits and receives the control command, and
the control unit (81) links the cause of the inconsistency to the control command from among a plurality of pieces of cause information, the plurality of pieces of cause information being set in advance, the control command being based on one of a remote controller (6) different from the air-conditioning remote controller (5), a centralized management center (7) that collectively manages air conditioning for a building, and an energy management center that manages power consumption in a home. 45 50 55
15. The air-conditioning remote controller (5) of any one of Claims 10 to 14, further comprising a first-information-side consistency button (87n) used to make the second information consistent with the first information, wherein
the control unit (81) overwrites and updates the second information held in the setting state information holding unit (92) with the first information held in the operation state information holding unit (91) when the first-information-side consistency button (87n) is operated. 5
16. The air-conditioning remote controller (5) of any one of Claims 10 to 14, further comprising:
a first-information-side consistency button (87n) used to make the second information consistent with the first information; and
a second-information-side consistency button (87m) used to transmit the second information to the indoor unit (11) so that the first information is made consistent with the second information, wherein
the display content generation unit (94) generates promotion content for promoting selection of one of the first-information-side consistency button (87n) and the second-information-side consistency button (87m), and
the display unit (85) makes the promotion content be displayed. 20 25 30 35
17. An indoor unit (11) for receiving a control command from an air-conditioning remote controller (5), comprising:
a transmitting and receiving unit (53) that transmits and receives a setting on the air-conditioning remote controller (5); and
a control unit (51) that compares the setting on the air-conditioning remote controller (5) with an operation content of the indoor unit (11), wherein the control unit (51) causes the transmitting and receiving unit (83) to transmit information of presence of an inconsistency between the operation content of the indoor unit (11) and the setting on the air-conditioning remote controller (5) and a current operation content of the indoor unit (11) to the air-conditioning remote controller (5) in a case where inconsistency is present between the operation content of the indoor unit (11) and the setting on the air-conditioning remote controller (5) in a special operation mode in which the indoor unit (11) performs determination and performs operation, and
the control unit (81) causes the transmitting and receiving unit (53) to transmit a current operation content of the indoor unit (11) to the air-conditioning remote controller (5) in a case where the 40 45 50 55

operation content of the indoor unit (11) and the setting on the air-conditioning remote controller (5) are consistent in the special operation mode in which the indoor unit (11) performs determination and performs operation.

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18. The indoor unit (11) of Claim 17, further comprising a notification unit (58) that gives notification of presence of an inconsistency between the operation content of the indoor unit (11) and the setting on the air-conditioning remote controller (5) in a case where inconsistency is present between the operation content of the indoor unit (11) and the setting on the air-conditioning remote controller (5).

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19. An air-conditioning system (1) comprising:

the air-conditioning remote controller (5) of any one of Claims 1 to 16; and
an air-conditioning apparatus including the indoor unit (11) of Claim 17 or 18 that receives a control command from the air-conditioning remote controller (5), and an outdoor unit connected to the indoor unit (11) via a refrigerant pipe.

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20. The air-conditioning system (1) of Claim 19, further comprising an energy management system (7) that transmits and receives one of the operation content of the indoor unit (11) and the control command to and from the air-conditioning apparatus via a telephone line or an IP network (10).

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FIG. 1

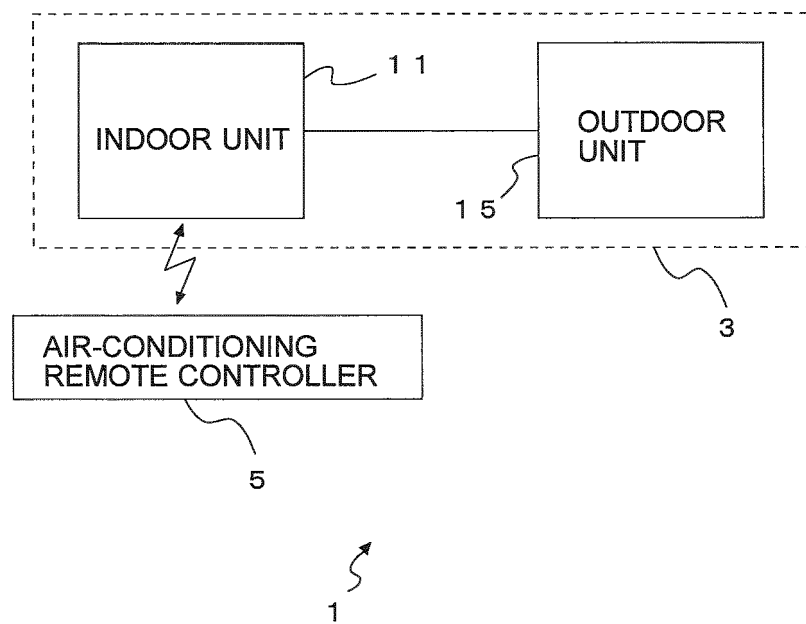


FIG. 2

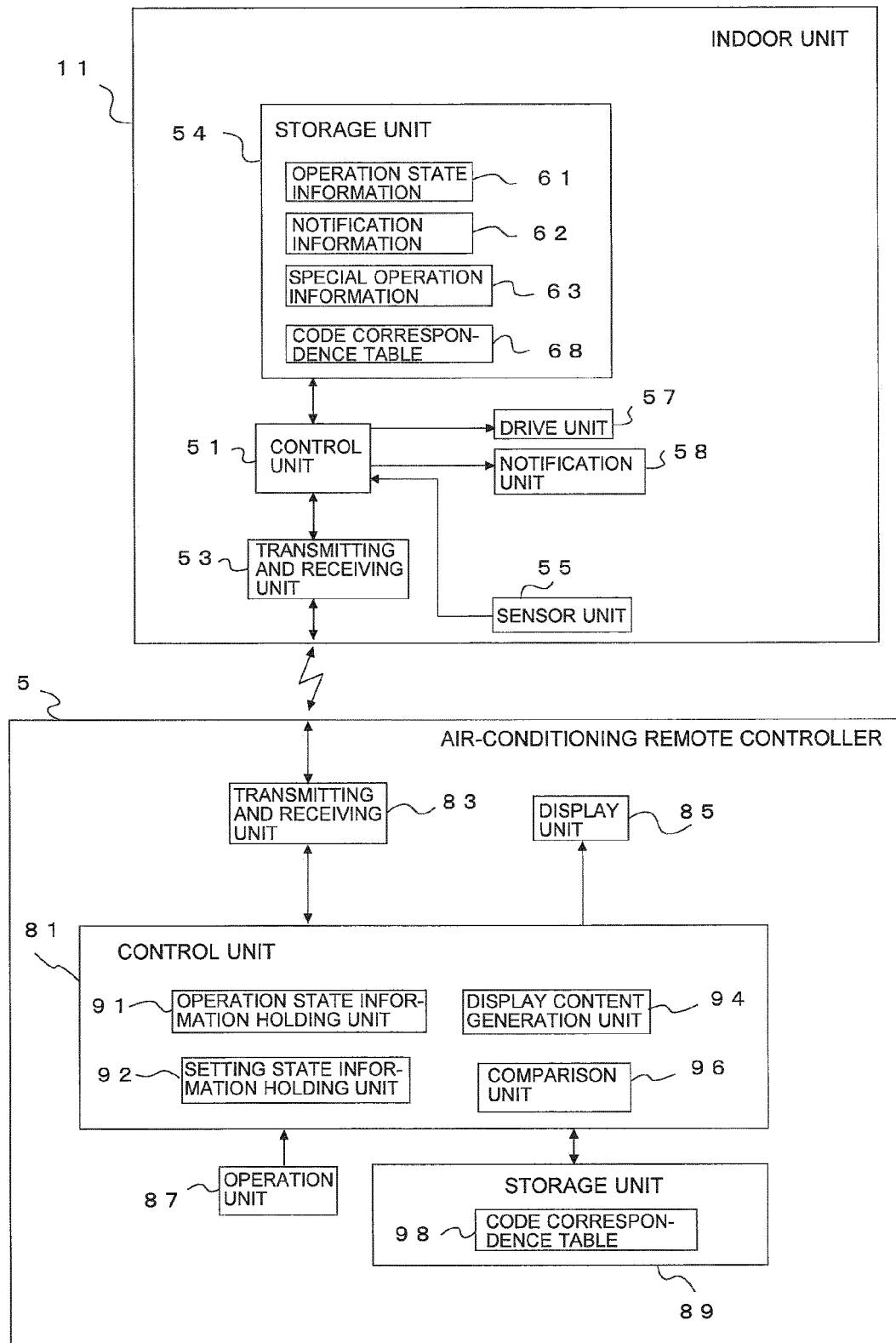


FIG. 3

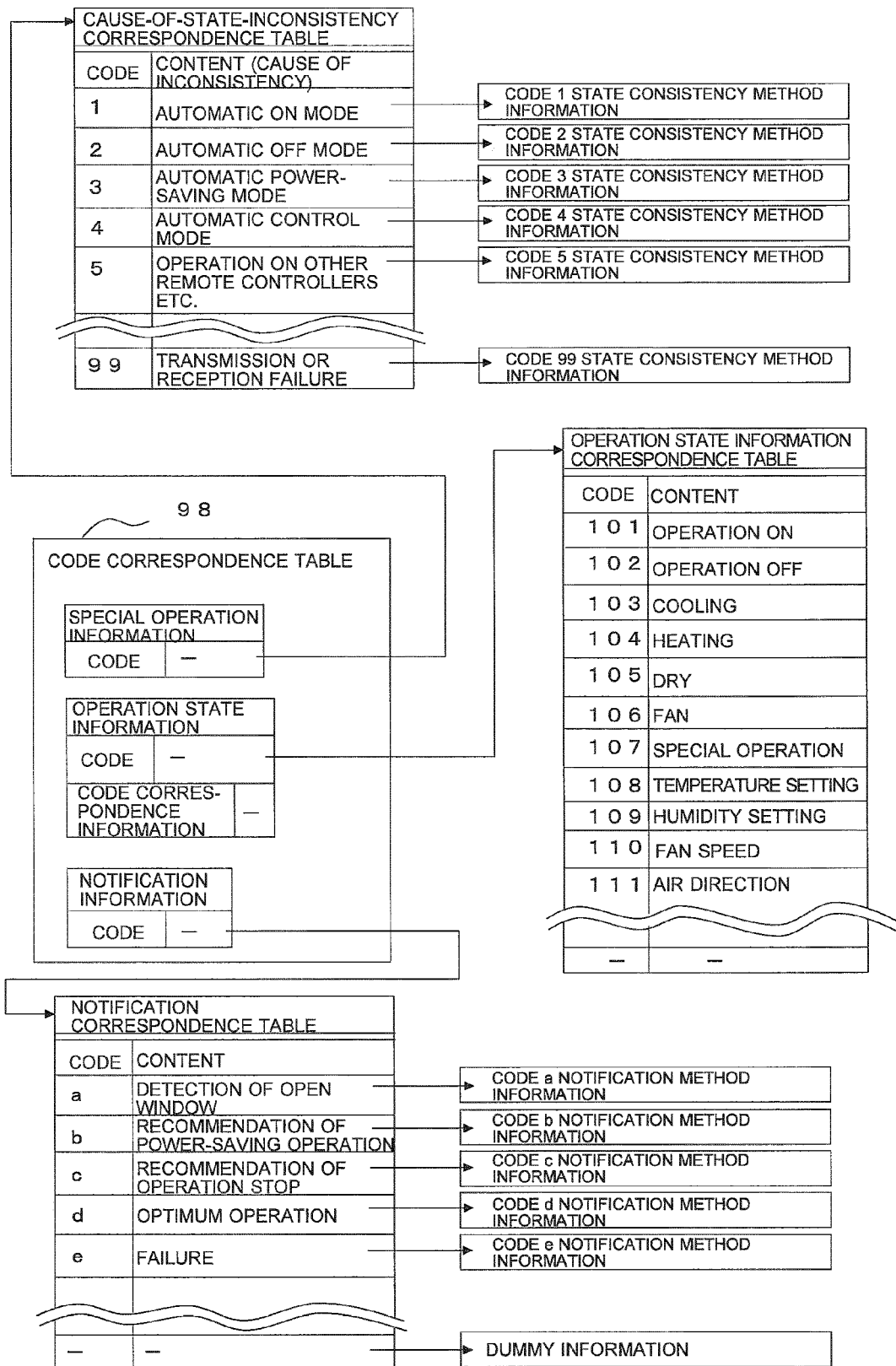


FIG. 4

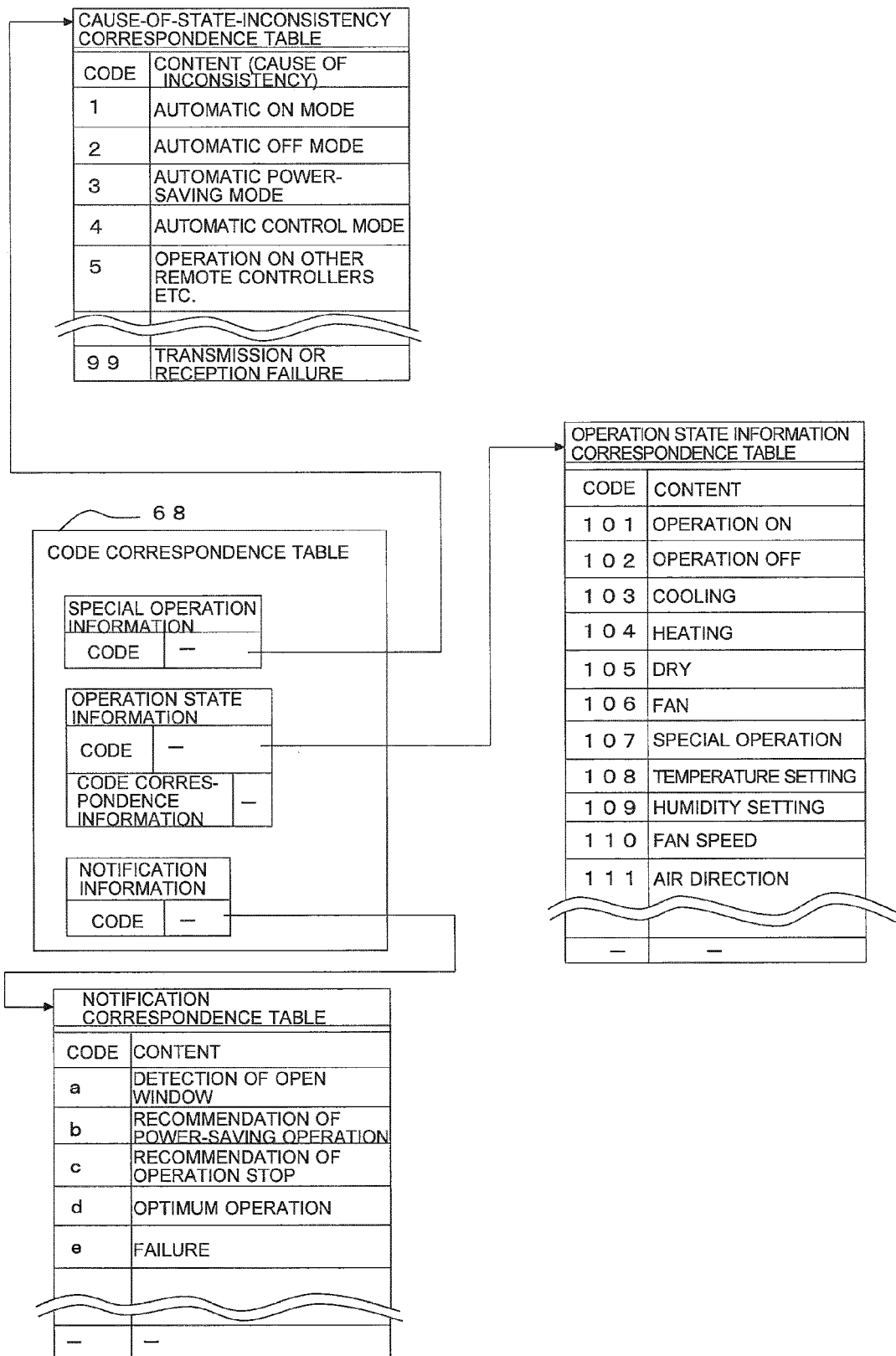


FIG. 5

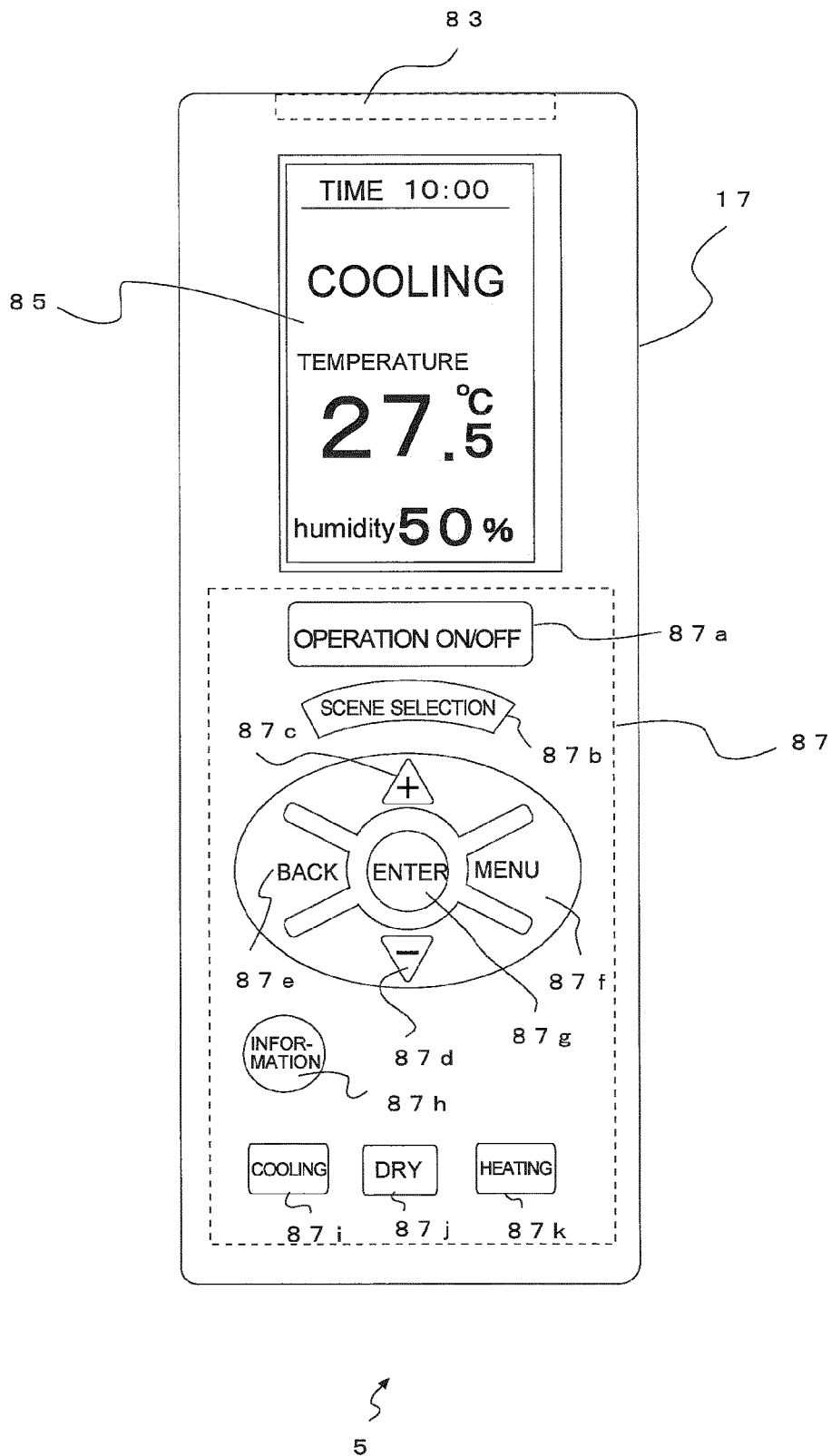


FIG. 6

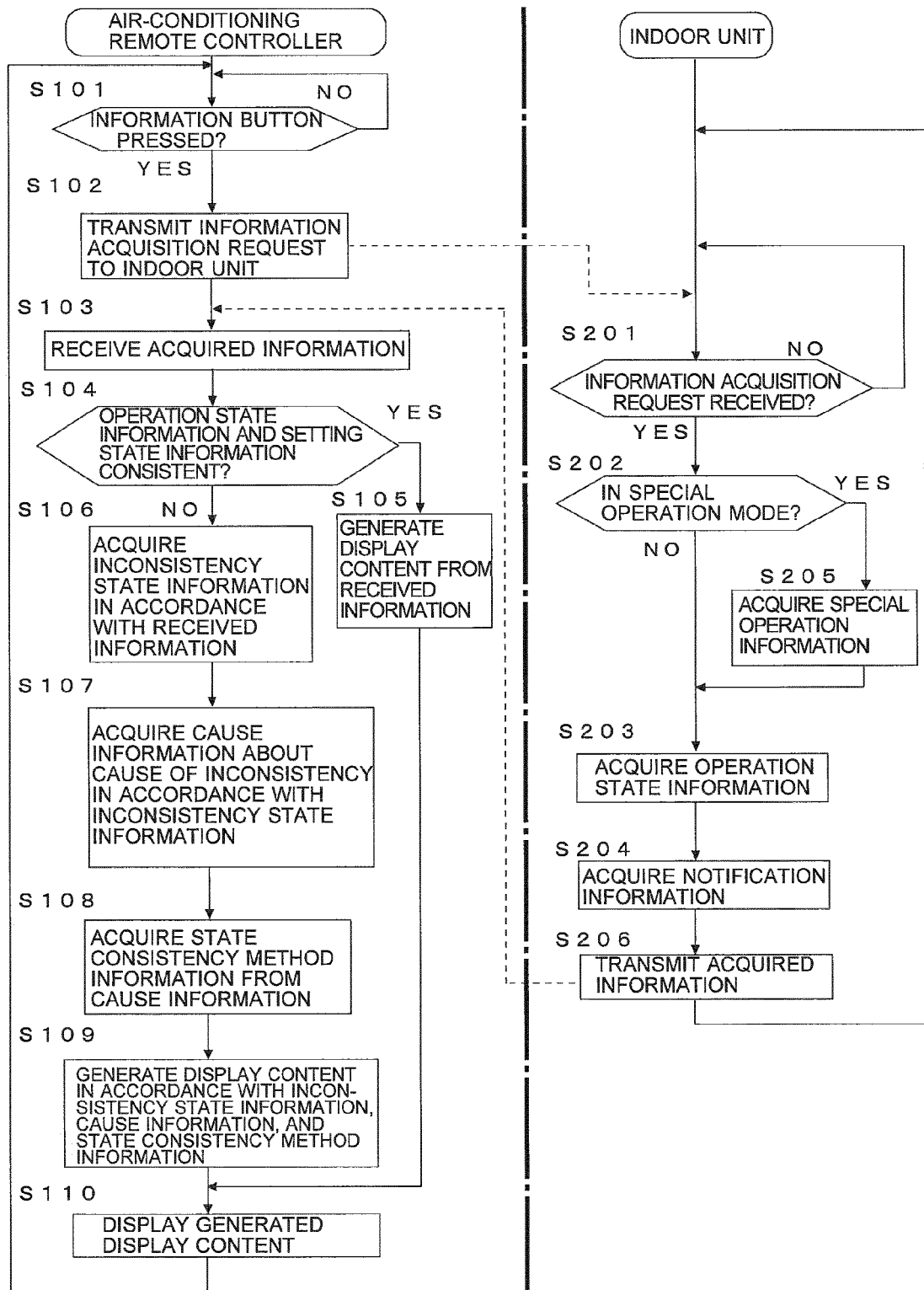


FIG. 7

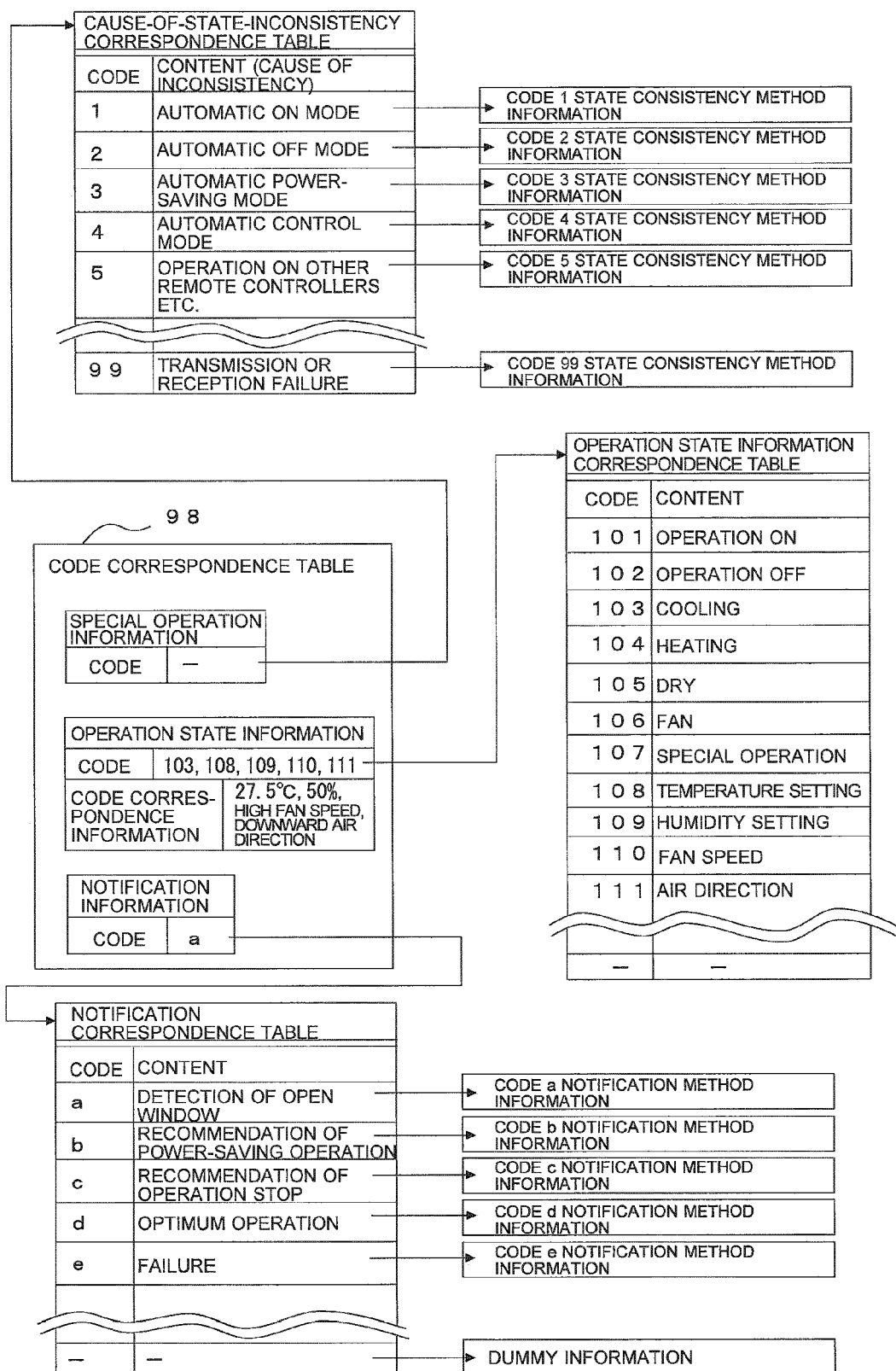


FIG. 8

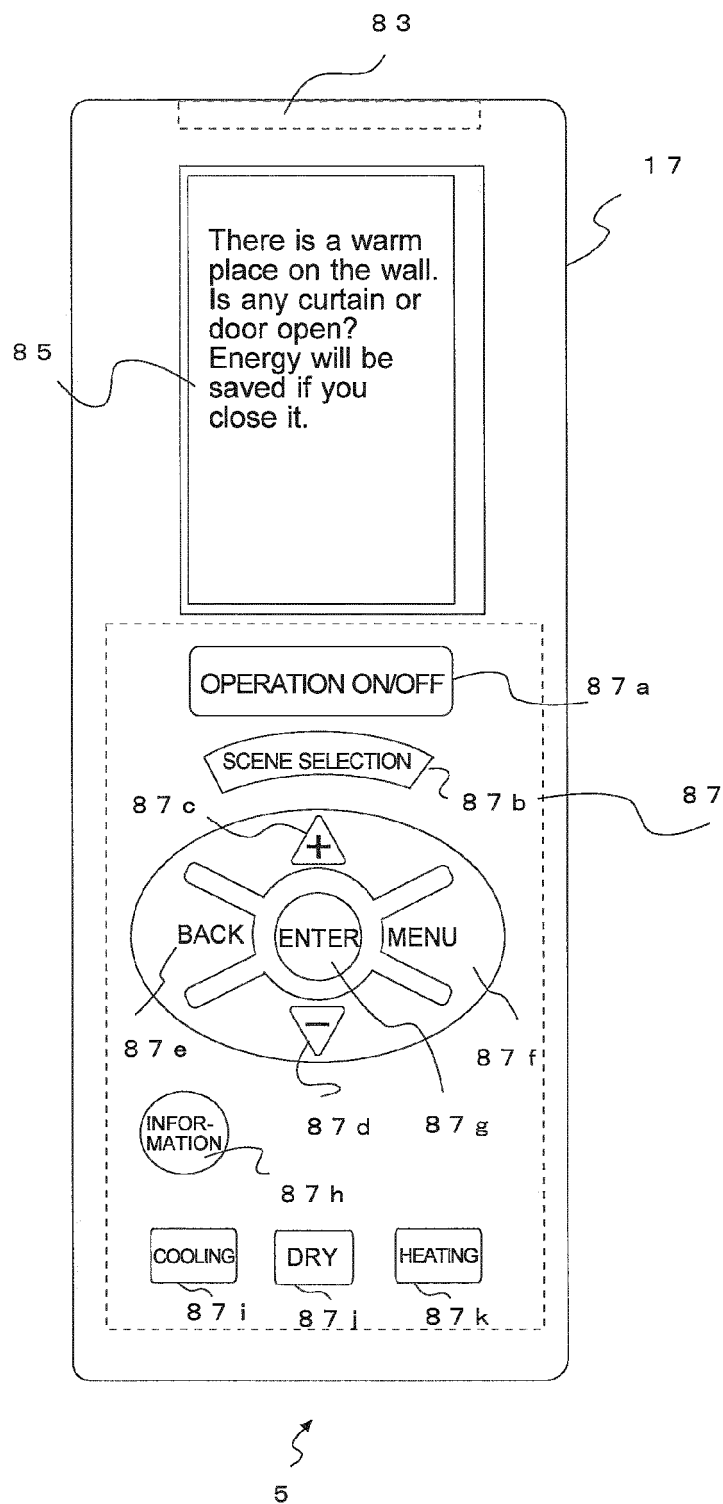


FIG. 9

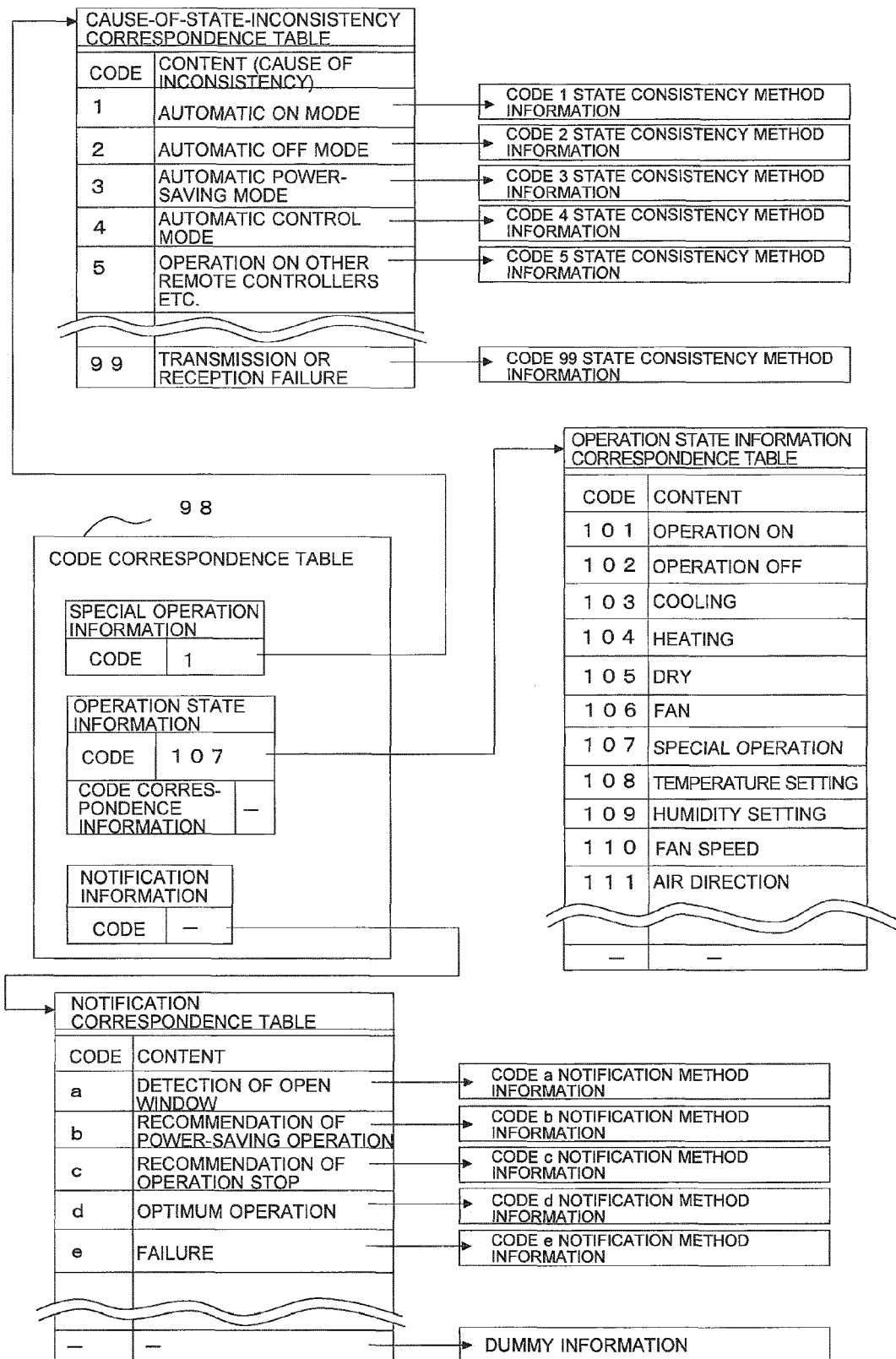


FIG. 10

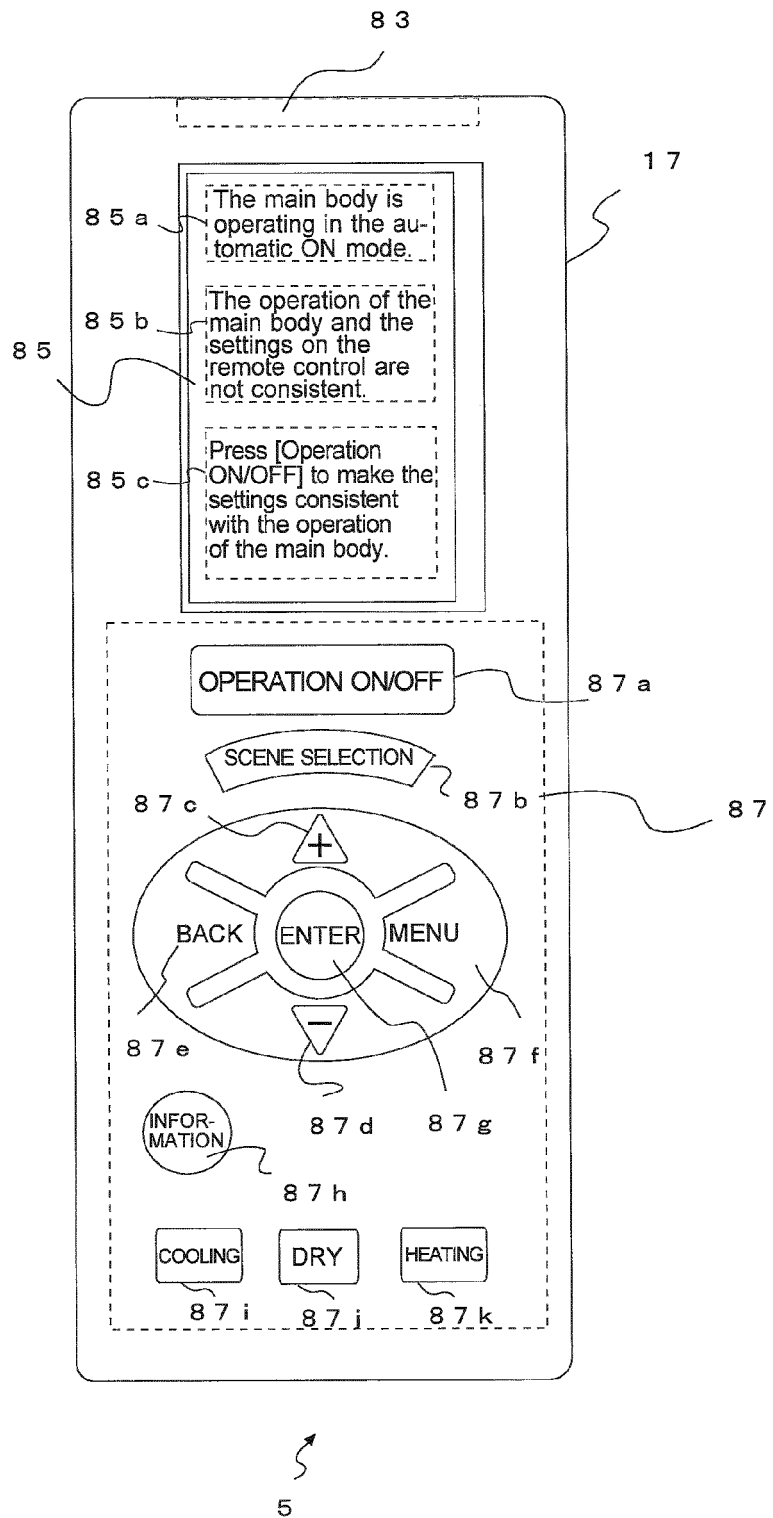


FIG. 11

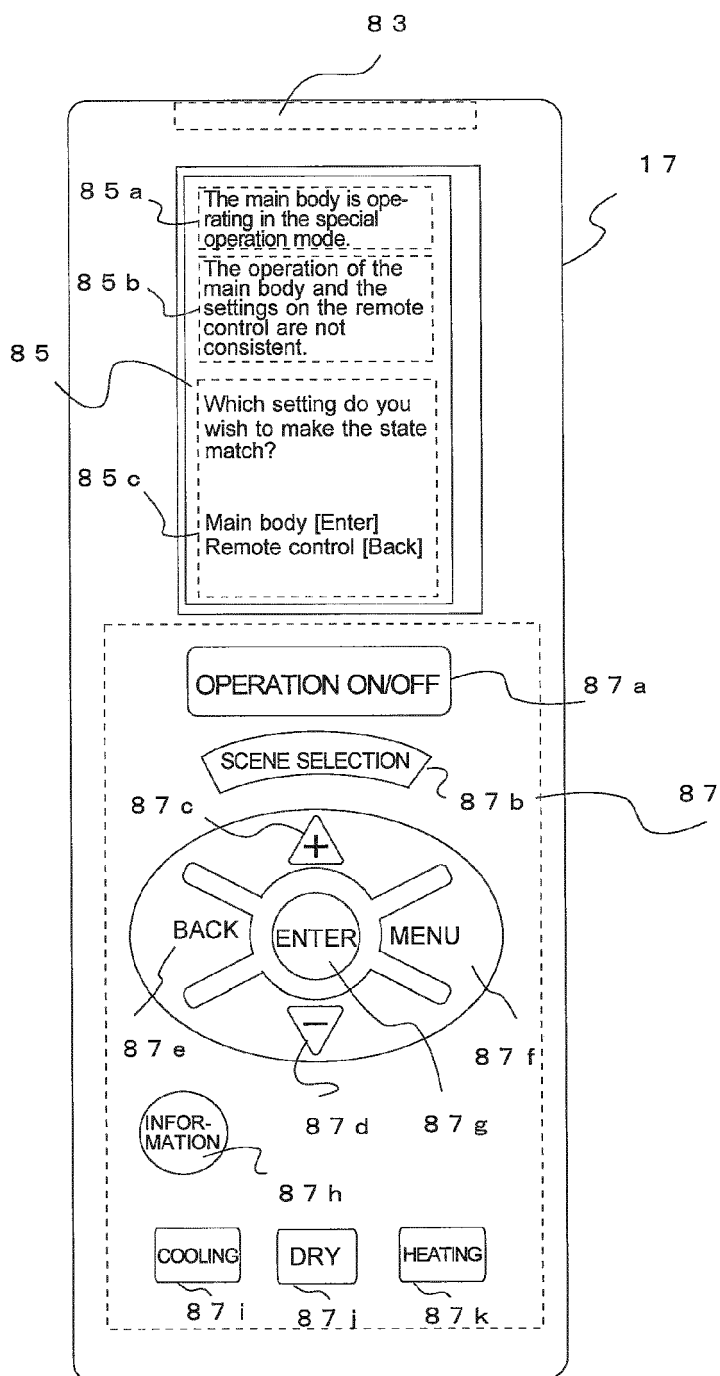


FIG. 12

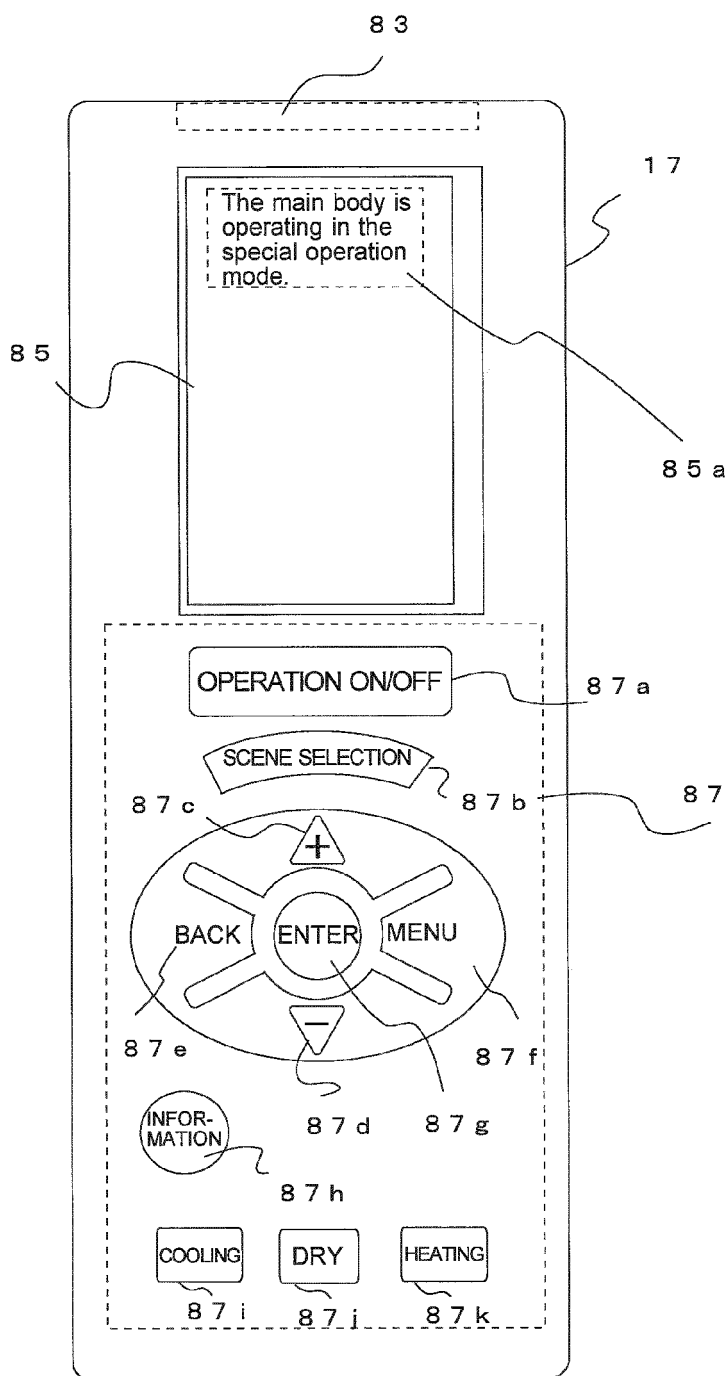


FIG. 13

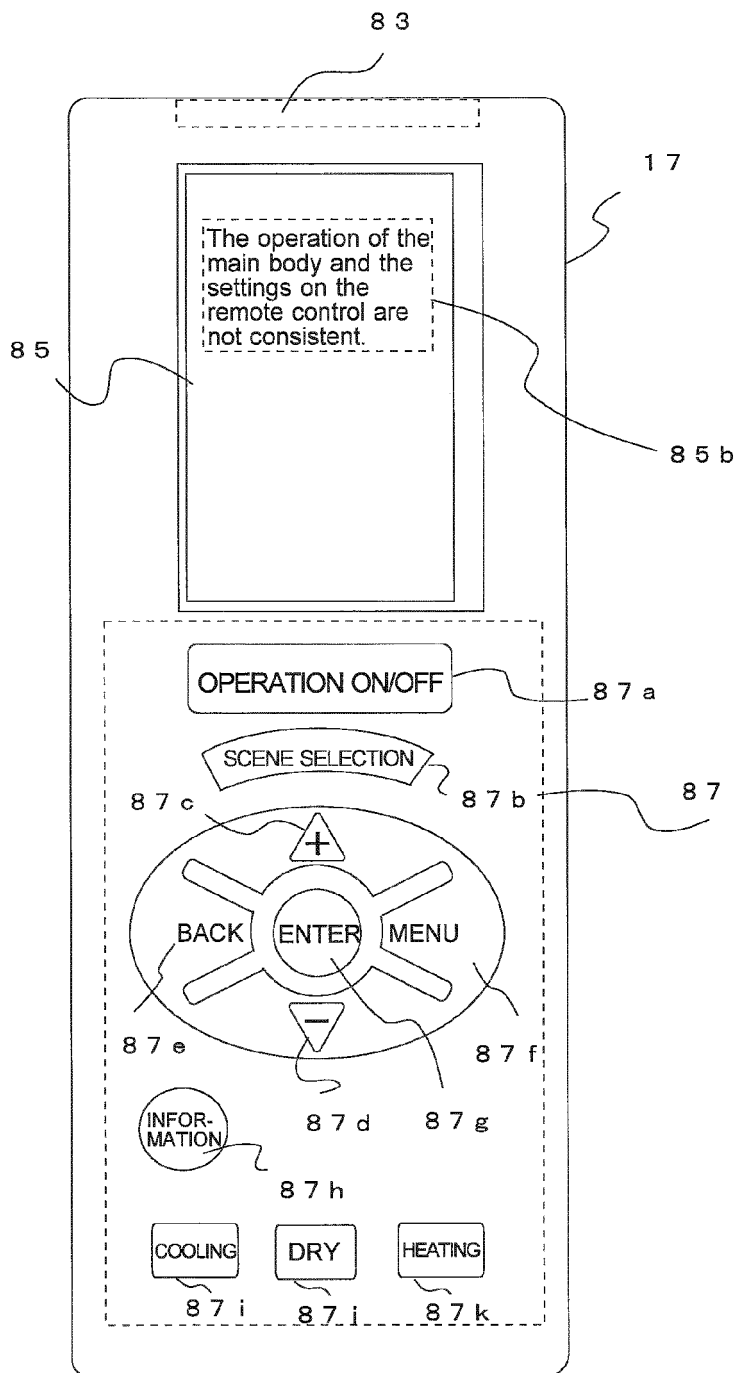


FIG. 14

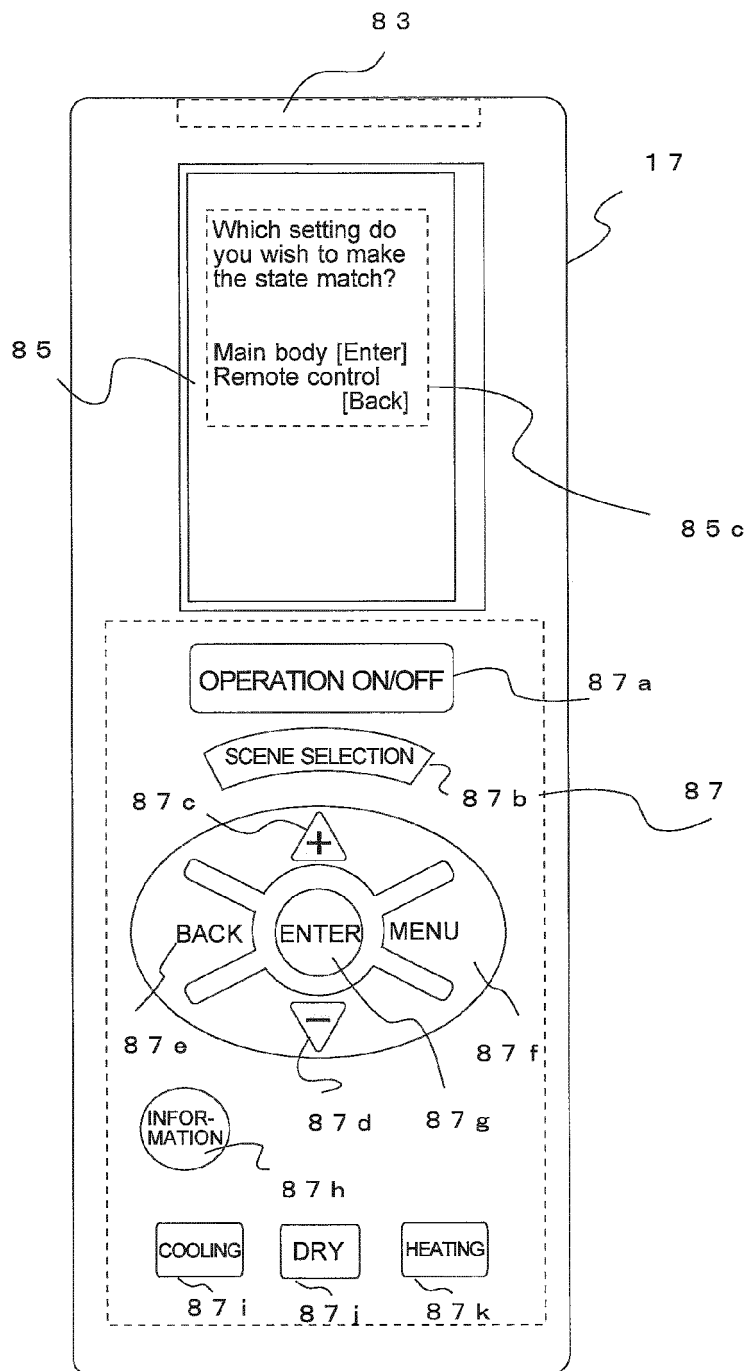


FIG. 15

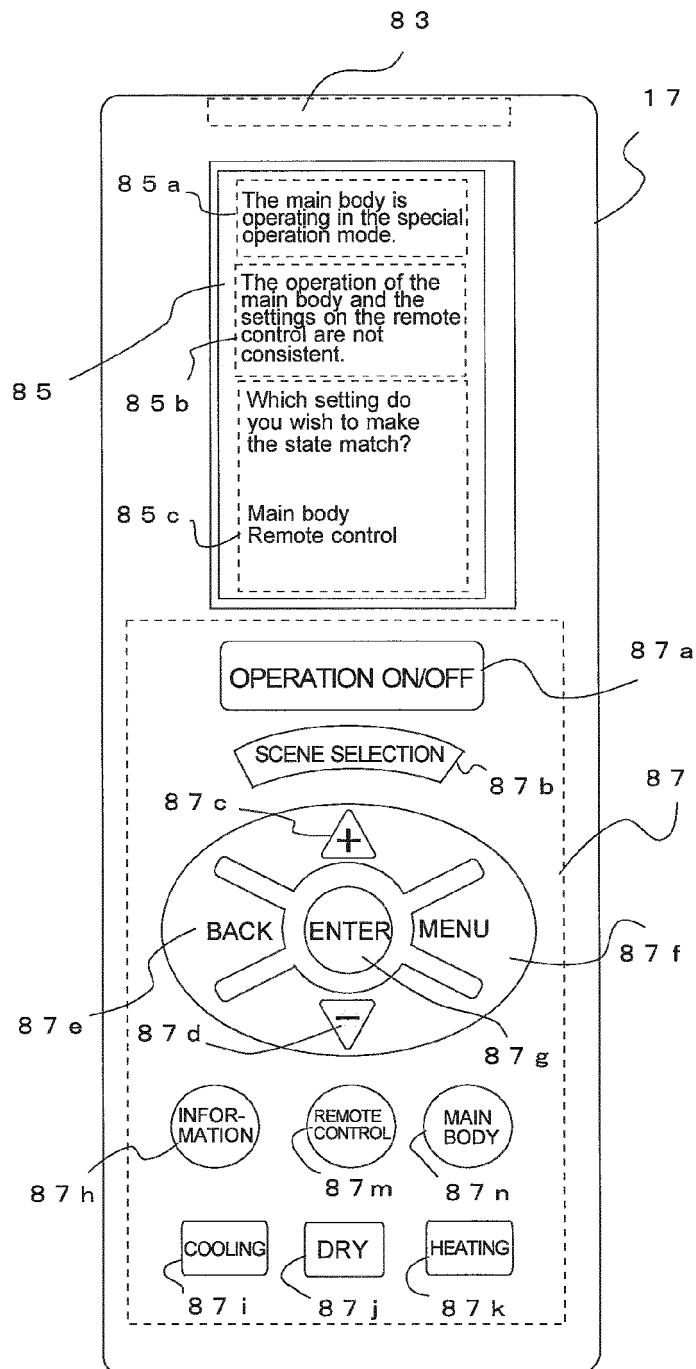


FIG. 16

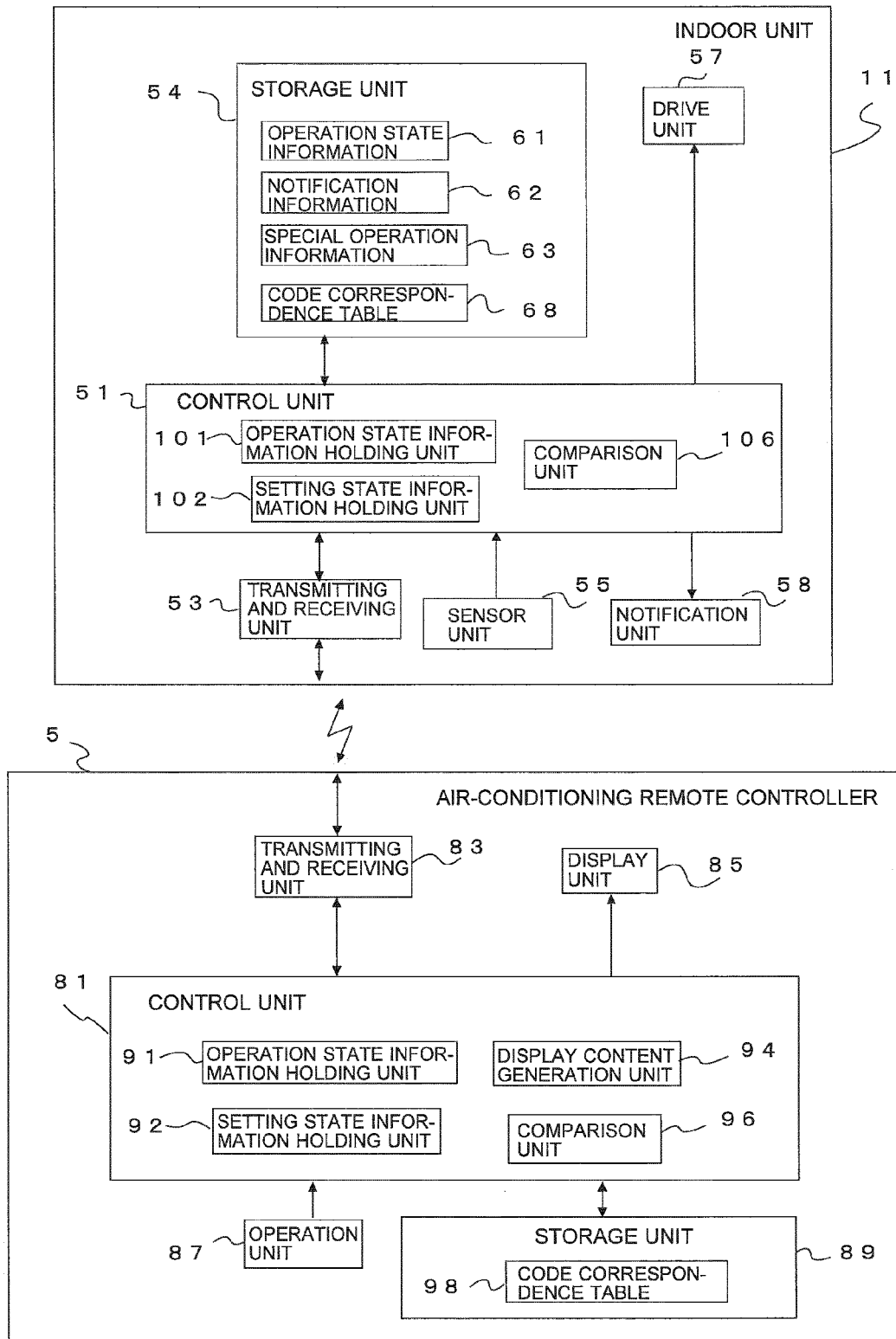


FIG. 17

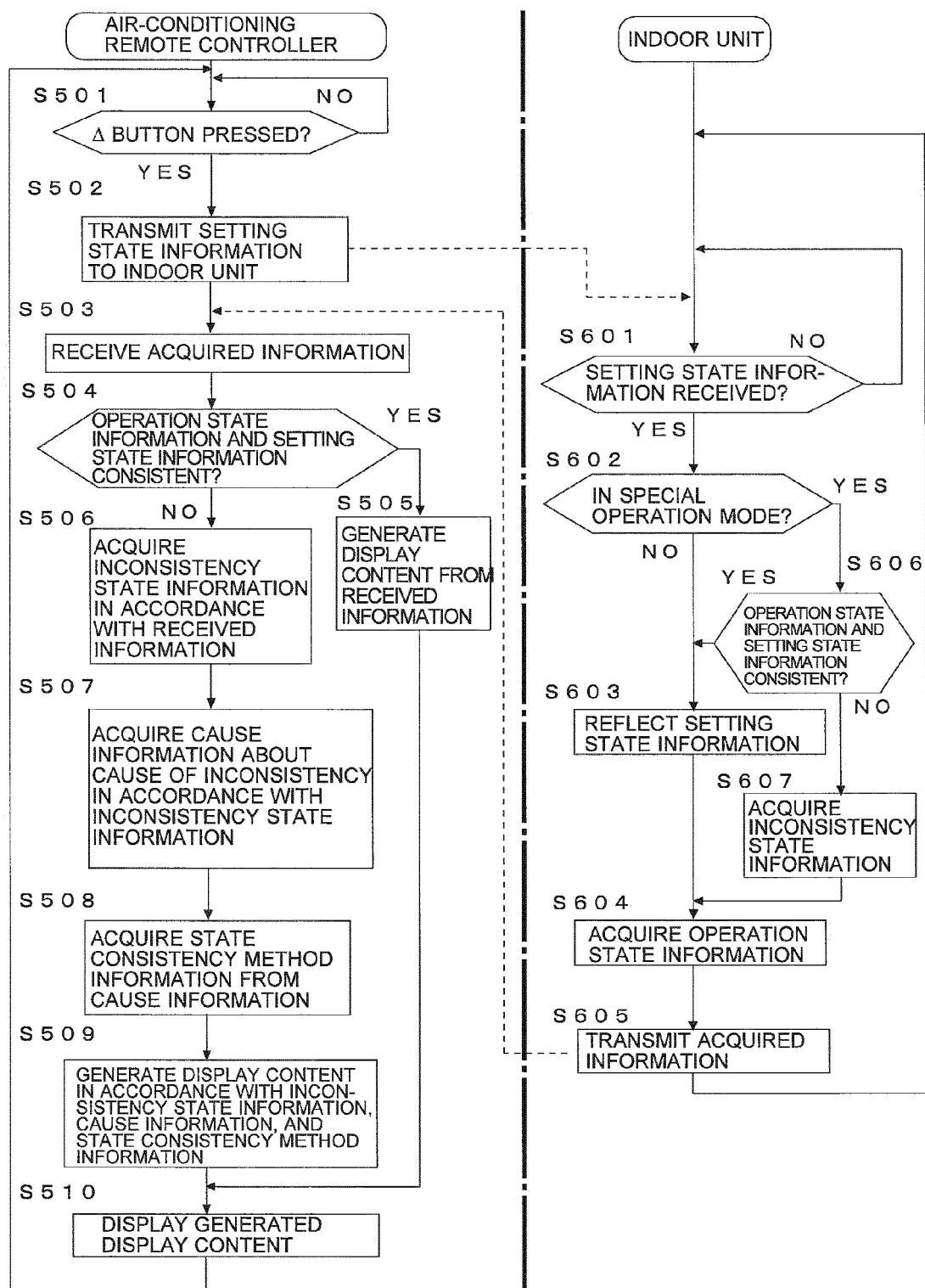
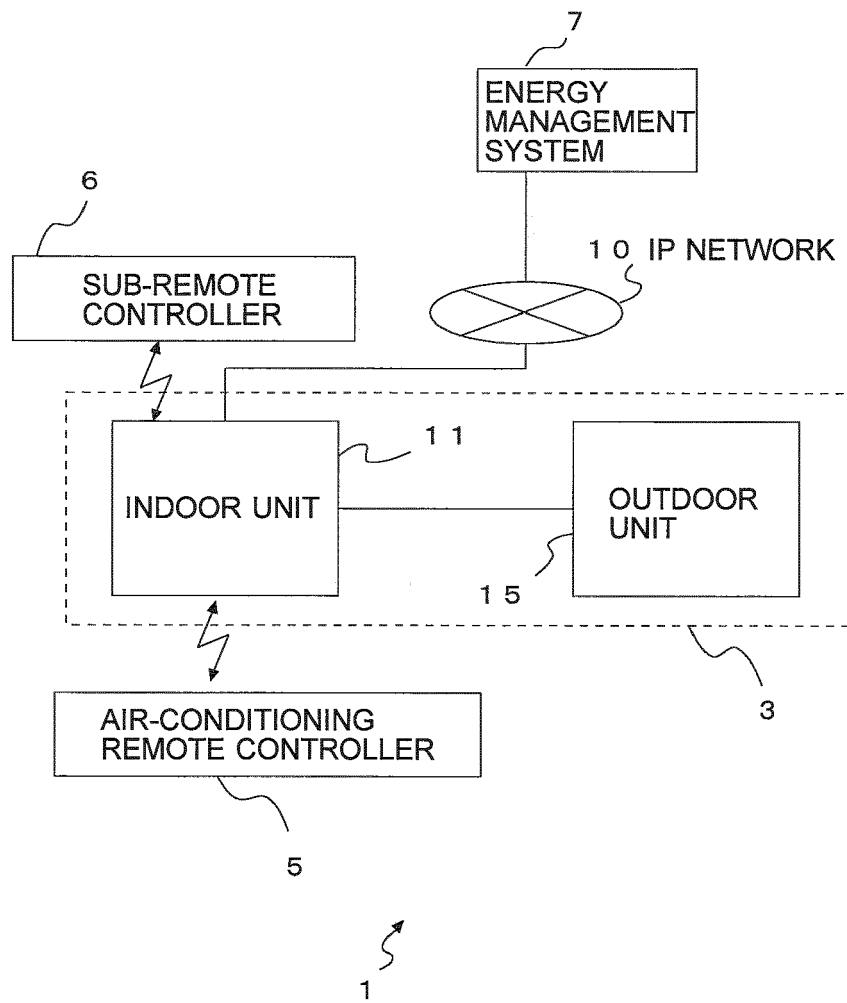


FIG. 18





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Application Number
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			F24F
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 22 November 2013	Examiner Decking, Oliver
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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