



(11) **EP 3 657 089 A1**

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
27.05.2020 Bulletin 2020/22

(51) Int Cl.:
F24F 11/56^(2018.01) F24F 11/63^(2018.01)

(21) Application number: **18838780.7**

(86) International application number:
PCT/JP2018/019974

(22) Date of filing: **24.05.2018**

(87) International publication number:
WO 2019/021610 (31.01.2019 Gazette 2019/05)

(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
Designated Validation States:
KH MA MD TN

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(30) Priority: **25.07.2017 JP 2017143482**

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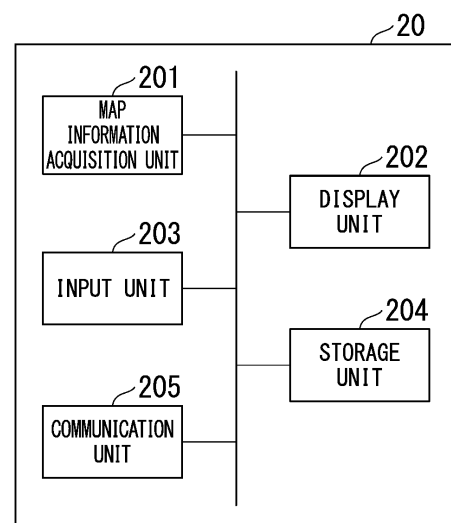
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(54) **ENVIRONMENT SETTING TERMINAL, AIR CONDITIONING SYSTEM, CONTROL METHOD, AND PROGRAM**

(57) An environment setting terminal for setting requested environment settings in an air conditioning control device that controls an air conditioning indoor unit in accordance with the requested environment settings requested by a user, the environment setting terminal including: a map display unit configured to display a map of an indoor in which the air conditioning indoor unit is installed; a position input unit configured to receive an input of a position designated by the user on the map; a storage unit configured to store the requested environment settings of the user; and a transmission unit configured to transmit user setting information in which the position and the requested environment settings are associated to the air conditioning control device.

FIG. 5



Description

[Technical Field]

[0001] The present invention relates to an environment setting terminal, an air conditioning system, a control method, and a program.

[0002] Priority is claimed on Japanese Patent Application No. 2017-143482, filed July 25, 2017, the content of which is incorporated herein by reference.

[Background Art]

[0003] There is an air conditioning system for acquiring a position where there is a person and changing settings. In Patent Literature 1, technology for acquiring position information set in correspondence with ID information of a transmission means for transmitting a user's request or acquiring position information recognized by reading a one-dimensional barcode or a two-dimensional barcode including specific position information attached to a fixed desk or chair and controlling an air conditioner according to the request is disclosed.

[Citation List]

[Patent Literature]

[0004] [Patent Literature 1]
Japanese Patent No. 4737037

[Summary of Invention]

[Technical Problem]

[0005] Incidentally, in air conditioning systems, there is a demand for technology for easily designating a position that is an air conditioning setting target.

[0006] Therefore, there is a demand for technology for allowing a user to easily designate a position in an indoor that is an air conditioning setting target when an air conditioning setting process is performed.

[0007] An objective of the present invention is to provide an environment setting terminal, an air conditioning system, a control method, and a program capable of solving the above-described problems.

[Solution to Problem]

[0008] A first aspect of the present invention provides an environment setting terminal for setting requested environment settings in an air conditioning control device that controls an air conditioning indoor unit in accordance with the requested environment settings requested by a user, the environment setting terminal including: a map display unit configured to display a map of an indoor in which the air conditioning indoor unit is installed; a position input unit configured to receive an input of a position

designated by the user on the map; a storage unit configured to store the requested environment settings of the user; and a transmission unit configured to transmit user setting information in which the position and the requested environment settings are associated to the air conditioning control device.

[0009] A second aspect of the present invention provides the environment setting terminal in the first aspect including: an environment input unit configured to receive the requested environment settings requested by the user, wherein the storage unit stores the requested environment settings received by the environment input unit.

[0010] A third aspect of the present invention provides the environment setting terminal in the first or second aspect including: a map information acquisition unit configured to acquire information indicating the map of the indoor in which the air conditioning indoor unit is installed, wherein the map display unit displays a map included in information indicating the map acquired by the map information acquisition unit, and wherein the position input unit receives an input of a position designated by the user in the map acquired by the map information acquisition unit.

[0011] A fourth aspect of the present invention provides the environment setting terminal in the third aspect including: the environment setting terminal according to claim 3, wherein the map information acquisition unit acquires information indicating the map while a predetermined person is moving in the indoor in which the air conditioning indoor unit is installed.

[0012] A fifth aspect of the present invention provides the environment setting terminal in the third aspect including: the environment setting terminal according to claim 3, wherein the map information acquisition unit acquires information indicating the map from layout information or CAD information of the indoor in which the air conditioning indoor unit is installed.

[0013] A sixth aspect of the present invention provides an air conditioning system including: an air conditioning indoor unit; the environment setting terminal in any one of the first to fifth aspects; and an air conditioning control device configured to control the air conditioning indoor unit on the basis of the user setting information in which the position designated by the user received from the environment setting terminal is associated with the requested environment settings requested by the user.

[0014] A seventh aspect of the present invention provides a control method to be performed by an environment setting terminal for setting requested environment settings in an air conditioning control device that controls an air conditioning indoor unit in accordance with the requested environment settings requested by a user, the control method including the steps of: displaying a map of an indoor in which the air conditioning indoor unit is installed; receiving an input of a position designated by the user on the map; storing the requested environment settings of the user; and transmitting user setting information in which the position and the requested environ-

ment settings are associated to the air conditioning control device.

[0015] An eighth aspect of the present invention provides a program which causes a computer of an environment setting terminal for setting requested environment settings in an air conditioning control device that controls an air conditioning indoor unit in accordance with the requested environment settings requested by a user to execute the steps of: displaying a map of an indoor in which the air conditioning indoor unit is installed; receiving an input of a position designated by the user on the map; storing the requested environment settings of the user; and transmitting user setting information in which the position and the requested environment settings are associated to the air conditioning control device.

[Advantageous Effects of Invention]

[0016] According to an environment setting terminal, an air conditioning system, a control method, and a program based on embodiments of the present invention, a user can easily designate a position in an indoor that is an air conditioning setting target when an air conditioning setting process is performed.

[Brief Description of Drawings]

[0017]

Fig. 1 is a diagram showing a configuration of an air conditioning system according to an embodiment of the present invention.

Fig. 2 is a first overhead view showing an example of a map according to an embodiment of the present invention.

Fig. 3 is a second overhead view showing an example of a map according to an embodiment of the present invention.

Fig. 4 is a diagram showing a configuration of an air conditioning indoor unit according to an embodiment of the present invention.

Fig. 5 is a diagram showing a configuration of an environment setting terminal according to an embodiment of the present invention.

Fig. 6 is an explanatory diagram showing the acquisition of map information according to an embodiment of the present invention.

Fig. 7 is a diagram showing an image for generating a straight line or a curve from an original image in an embodiment of the present invention.

Fig. 8 is an explanatory diagram showing the reduction of an influence of noise in an original image in an embodiment of the present invention.

Fig. 9 is a diagram showing a display example of a display unit according to an embodiment of the present invention.

Fig. 10 is a diagram showing a configuration of an air conditioning control device according to an em-

bodiment of the present invention.

Fig. 11 is a diagram showing a processing flow of an environment setting terminal according to an embodiment of the present invention.

Fig. 12 is a schematic block diagram showing a configuration of a computer according to at least one embodiment.

[Description of Embodiments]

<Embodiments>

[0018] Hereinafter, embodiments will be described in detail with reference to the drawings.

[0019] A configuration of an air conditioning system 1 according to an embodiment of the present invention will be described.

[0020] The air conditioning system 1 according to the embodiment of the present invention is a system for acquiring information of a position designated by a user on a map of an indoor in which an air conditioning indoor unit is installed, thereby controlling air conditioning of the position.

[0021] The air conditioning system 1 includes an air conditioning indoor unit 10, an environment setting terminal 20, and an air conditioning control device 30, as shown in FIG. 1.

[0022] The air conditioning indoor unit 10 sends air to the position designated by the user.

[0023] The environment setting terminal 20 transmits user setting information in which the position designated by the user on the map of the indoor in which the air conditioning indoor unit 10 is installed is associated with requested environment settings to the air conditioning control device 30.

[0024] Here, for example, the map of the indoor in which the air conditioning indoor unit 10 is installed is a map of an overhead view of the indoor after the indoor in which the air conditioning indoor unit 10 is installed is divided into 31 areas as shown in Fig. 2. Area numbers 1 to 31 are assigned to the respective areas and the identification of the area number means the identification of the position in the indoor. Each area may be identified by coordinates as shown in Fig. 3 instead of the area number. For example, the coordinates of the center of each area may be adopted as the coordinates or the coordinates of a predetermined position of each area (for example, the lower left position of each area in Fig. 3) may be adopted as the coordinates. Fig. 3 shows an example of coordinates corresponding to the area number 12 shown in Fig. 2 and coordinates corresponding to area numbers other than the area number 12 in Fig. 3 are omitted.

[0025] Also, the requested environment settings are setting values of the environment requested by the user at the position designated by the user and are setting values including at least a temperature and an air volume at the position designated by the user.

[0026] The air conditioning control device 30 controls the air conditioning indoor unit 10 on the basis of the user setting information. Specifically, the air conditioning control device 30 receives the user setting information from the environment setting terminal 20, identifies a control signal for implementing the setting values of the temperature and the air volume indicated by the requested environment settings with respect to the position designated by the user included in the received user setting information, and controls the air conditioning indoor unit 10 by transmitting the identified control signal to the air conditioning indoor unit 10. For example, the control signal for implementing the setting values of the temperature and the air volume indicated by the requested environment settings is obtained in advance by simulation or experiment and stored in the storage unit.

[0027] The air conditioning indoor unit 10 includes a communication unit 101 and a blowing mechanism 102 as shown in FIG. 4.

[0028] The communication unit 101 communicates with the air conditioning control device 30. The communication unit 101 receives the control signal for implementing the setting values indicated by the requested environment settings from the air conditioning control device 30.

[0029] The blowing mechanism 102 sends air at a constant temperature, an air volume, a wind direction, or the like according to the control signal received by the communication unit 101.

[0030] As shown in Fig. 5, the environment setting terminal 20 includes a map information acquisition unit 201, a display unit 202 (an example of a map display unit), an input unit 203 (an example of a position input unit and an example of an environment input unit), a storage unit 204 and a communication unit 205 (an example of a transmission unit). The environment setting terminal 20 is, for example, a smartphone.

[0031] The map information acquisition unit 201 acquires information indicating a map of the indoor in which the air conditioning indoor unit 10 is installed.

[0032] Specifically, the map information acquisition unit 201 acquires information indicating the map while a person carrying the environment setting terminal 20 is moving in the indoor in which the air conditioning indoor unit 10 is installed.

[0033] For example, when the air conditioning indoor unit 10 is installed in the indoor, a person in charge of the installation carries the environment setting terminal 20 and moves along a wall in the indoor as shown in Fig. 6. While the person in charge of the installation is moving in the indoor, the map information acquisition unit 201, for example, calculates a movement direction and a movement distance on the basis of sensor information of an acceleration sensor, a gyro sensor, and the like and acquires a shape of a room. When, for example, a Global Positioning System (GPS) function cannot be used, the movement direction and the movement distance to be calculated by the map information acquisition unit 201

on the basis of information of the acceleration sensor, the gyro sensor, and the like may be calculated using autonomous navigation technology in which a car navigation system estimates a movement direction and a movement distance of a car using information of an acceleration sensor, a gyro sensor, and the like. The map information acquisition unit 201 divides the room of the acquired shape into a plurality of areas. Then, the map information acquisition unit 201 adds a position of an air outlet of the air conditioning indoor unit 10 to the map, for example, according to the input of position information from the person in charge of the installation or the user or the like.

[0034] Also, for example, the map information acquisition unit 201 may acquire information indicating a map of the indoor in which the air conditioning indoor unit 10 is installed in the following method. Each of three or more microphones is installed at a different position where the position can be identified on the ceiling of the room. When the air conditioning indoor unit 10 is installed in the indoor, the person in charge of the installation carries the environment setting terminal 20 and moves along the wall in the indoor (in a direction of an arrow shown in Fig. 6) as shown in Fig. 6. While the person in charge of the installation is moving in the indoor, the environment setting terminal 20 outputs ultrasonic waves. A map generation device (not shown) calculates the position of the environment setting terminal 20 outputting the ultrasonic waves on the basis of a difference between timings at which the respective microphones have received the ultrasonic waves from the environment setting terminal 20 and positions of the respective microphones, acquires the shape of the room, and divides the room having the acquired shape into a plurality of areas to generate a map. The map generation device (not shown) adds a position of the air outlet of the air conditioning indoor unit 10 to the map, for example, according to an input of position information from the person in charge of the installation, the user, or the like. The map information acquisition unit 201 acquires the map from the map generation device (not shown).

[0035] Also, for example, the map information acquisition unit 201 may acquire information indicating the map from layout information or computer-aided design (CAD) information of the indoor in which the air conditioning indoor unit 10 is installed. Specifically, the map information acquisition unit 201 has a scanner function and reads a drawing showing a layout of the indoor with the scanner function. Alternatively, the map information acquisition unit 201 has a camera function and photographs a drawing showing the layout of the indoor with the camera function. The drawing showing the layout includes a handwritten drawing. The user can input an instruction for correcting the handwritten outer shape of the layout to a straight line or a curve to the map information acquisition unit 201.

[0036] A case in which the straight line or the curve is generated using a Bezier curve, a spline curve, a broken

line passing through a control point, or the like used in, for example, computer graphics and the like, is conceivable. As an example, an image of an image processing method of taking control points for applying a function of representing the straight line or the curve generated as described above is shown in Fig. 7. Part (1) of Fig. 7 is an original image. An image obtained by scanning the original image is binarized (part (2) of Fig. 7) and an outline is extracted. Coordinates of the control point are acquired at appropriate intervals (which may not be equal intervals) along the outline (part (3) of Fig. 7). The control point is interpolated with a Bezier curve, a spline curve, a broken line, or the like part (4) of Fig. 7). Also, a start point and an end point are matched to form a closed curve.

[0037] Also, as shown in Fig. 8, the influence of noise may be reduced by taking a moving average of coordinates along a curve.

[0038] Also, when the above-described function is used, for example, the order of the function may be set by the user inputting a numerical value as a user interface. Also, for example, a "coarse" button and a "fine" button are provided. When the user reproduces a curve in accordance with the number of times the "rough" button is pressed, the number of unit pixels for pixels responsible for displaying a part of the curve is increased and therefore a curve coarser than the curve of the original image is displayed. Also, when the user reproduces the curve in accordance with the number of times the user presses the "fine" button, the number of unit pixels for pixels responsible for displaying a part of the curve is reduced and therefore a curve finer than the curve of the original image is displayed. In this manner, it is possible to adjust whether the curve of the original image is roughly displayed or faithfully displayed. The display may be pre-viewed.

[0039] When the user's instruction for correcting the handwritten outer shape of the layout to a straight line or a curve has been input, the map information acquisition unit 201 corrects the outer shape of the layout in accordance with the input instruction. For example, the map information acquisition unit 201 writes the layout read by the scanner function or the layout photographed by the camera function as a map to the storage unit 204. Also, the user can input height information of a space of the indoor and information indicating a position of a door, a window, an obstacle, or the like to the map information acquisition unit 201 according to an operation of inputting coordinates or an operation of issuing an instruction on a display screen of the display unit 202. Thereby, the map information acquisition unit 201 acquires a map having height information of the space of the indoor, and information indicating the position of a door, a window, an obstacle, or the like. Also, the height information of the space of the indoor, and the information indicating the position of a door, a window, an obstacle, or the like are used for air conditioning control of the air conditioning control device 30 at a position designated by the user.

[0040] Also, when the wall of the room is a plane, i.e., when no curve is included in the shape when the room is viewed from above, the map information acquisition unit 201 may identify a shape of the room from only position information at each corner of the room and acquire a generated map.

[0041] Also, the size of one area may be any size. For example, the size of one area may be predetermined. Also, for example, the size of one area may be determined by a map creator selecting one possible size from among a plurality of possible sizes every time a map is generated after a plurality of possible sizes are prepared in advance. Also, for example, the size of one area may be determined by the map creator designating numerical values for identifying the size of the area every time a map is generated (for example, a vertical length and a horizontal length when the area is a quadrangle). Because a possibility that a plurality of persons will be present in the same area is low when the size of one area is a size of an area occupied by one person, each user can set requested environment settings to his/her preferred setting values all the time.

[0042] Also, for example, any shape including a lattice shape of a hexagon or a triangle other than a quadrangle may be able to be selected as the shape of one area.

[0043] Also, when the indoor is large or the lattice is fine, the map may be set to be zoomed in/out by the user performing a pinch-in/out operation on the screen of the display unit 202 or scrolled by the user performing a flick/swipe operation thereon. In this manner, the number of erroneous operations by the user can be reduced by allowing the user to perform a zoom-in/out operation and a scrolling operation on the screen of the display unit 202.

[0044] Also, there is only one map common to each environment setting terminal 20 and a new map is overwritten on the existing map when a new map is generated. When the position designated by the user is the user's own position, a map indicating each indoor previously visited by the user, position information of the indoor, and identification information of the user may be written, for example, to the storage unit 204, so as to be related to each other and the position information may be identified, so that the identification information of the user and the map associated with the position information may be read from the storage unit 204. Position information indicating a current position of the user may be acquired by, for example, a Global Positioning System (GPS). Also, the position information for identifying the map of the indoor where the user is currently present can be acquired as a position of the indoor in which a transmitter is provided, for example, when a transmitter (a receiver) provided in the indoor has received a signal from a wireless tag or each environment setting terminal 20 indoor. Also, the position information of the user may be acquired as a position of the indoor in which a card reader is provided by holding an entrance card storing identification information of the user over the card reader provided at the entrance of the indoor. Also, an entrance gate may be

used instead of the above-described card reader or the user's position may be identified by logging in to a personal computer and position information may be acquired.

[0045] The display unit 202 displays a map of the indoor in which the air conditioning indoor unit 10 is installed. For example, as shown in Fig. 9, a map showing a shape of a room, respective areas into which the room is divided, and air outlets F (two air outlets in the example shown in Fig. 9) of the air conditioning indoor unit 10 in the room is displayed. Also, for example, as shown in Fig. 9, the display unit 202 shows setting values (a temperature and an air volume in the example shown in Fig. 9) of requested environment settings designated by the user. Also, the display unit 202 may scroll the map which is being generated by the map generation device according to movement while the person in charge of the installation is moving in the indoor and the display unit 202 may adjust the map to an appropriate scale or the user may manually adjust the map to an appropriate scale.

[0046] Also, the display unit 202 is not limited to an air outlet, and may display an obstacle, a door, a window, a desk, a sofa, a cabinet, a shelf, a copy machine, and the like on the screen. For example, illustrations showing parts such as an obstacle, a door, a window, a desk, a sofa, a cabinet, a shelf, a copy machine, and the like are prepared in advance in an area different from the map area on the screen and designated to be disposed by the user dragging and dropping the illustrations on the map on the screen of the display unit 202. The display unit 202 displays the parts on the map in accordance with the designation. A size and a shape of the part may be selected or input from another setting menu or may be adjusted by a pinch-in/out operation. The information of the map in which the parts are disposed may be used for air conditioning control of the air conditioning control device 30 at a position designated by the user. Also, a material of a wall of the indoor or a physical object placed in the indoor may be further set. In this case, air conditioning control of the air conditioning control device 30 at the position designated by the user is enabled in consideration of ease of heat transfer.

[0047] The input unit 203 receives an input of a position designated by the user on the map, i.e., a position where an air conditioning setting process is desired on the map (for example, a position designated by the user). For example, in the map displayed on the display unit 202, an input is performed by the user designating an area number for designating an area desired to be set for air conditioning with a cursor. Also, for example, the user inputs a value desired to be set by pressing a button for inputting coordinates for designating an area in the map displayed on the display unit 202. The input unit 203 receives a signal indicating an area designated by an operation of the user.

[0048] Also, the input unit 203 receives an input of requested environment settings including at least the temperature and the air volume designated by the operation

of the user. The input unit 203 writes the received requested environment settings to the storage unit 204.

[0049] The storage unit 204 stores the requested environment settings of the user.

[0050] The communication unit 205 transmits user setting information in which the position designated by the user in the map of the indoor in which the air conditioning indoor unit 10 is installed received by the input unit 203 and the requested environment settings are associated to the air conditioning control device 30.

[0051] The air conditioning control device 30 includes a communication unit 301 and a control unit 302 as shown in FIG. 10.

[0052] The communication unit 301 communicates with the environment setting terminal 20. Specifically, the communication unit 301 receives the user setting information in which the position designated by the user in the map of the indoor in which the air conditioning indoor unit 10 is installed and the requested environment settings are associated from the environment setting terminal 20.

[0053] Also, the communication unit 301 communicates with the air conditioning indoor unit 10. Specifically, the communication unit 301 transmits a control signal for implementing setting values indicated by the requested environment settings received from the environment setting terminal 20 to the air conditioning indoor unit 10.

[0054] The control unit 302 controls a temperature, an air volume, a wind direction, and the like of wind sent out by the air conditioning indoor unit 10. Specifically, the control unit 302 generates a control signal for implementing the setting values indicated by the requested environment settings received by the communication unit 301 from the environment setting terminal 20. The control unit 302 transmits the generated control signal to the air conditioning indoor unit 10 via the communication unit 301.

[0055] Next, a process of the air conditioning system 1 according to an embodiment of the present invention will be described.

[0056] Here, a processing flow of the environment setting terminal 20 shown in Fig. 11 will be described.

[0057] The map information acquisition unit 201 acquires information indicating a map of the indoor in which the air conditioning indoor unit 10 is installed (step S1).

[0058] The map information acquisition unit 201 outputs the acquired information indicating the map to the display unit 202.

[0059] The display unit 202 receives the information indicating the map from the map information acquisition unit 201.

[0060] The display unit 202 displays the map of the indoor in which the air conditioning indoor unit 10 is installed on the basis of the information indicating the map received from the map information acquisition unit 201 (step S2).

[0061] For example, as shown in Fig. 9, a map showing a shape of a room, respective areas into which the room is divided, and air outlets F (two air outlets in the example

shown in Fig. 9) of the air conditioning indoor unit 10 in the room is displayed. Also, for example, as shown in Fig. 9, the display unit 202 indicates setting values (a temperature and an air volume in the example shown in Fig. 9) of requested environment settings designated by the user.

[0062] The user looks at the display on the display unit 202 and performs an operation of designating a position on the map on the environment setting terminal 20.

[0063] The input unit 203 receives an input of the position designated by the user on the map, that is, a position where air conditioning is desired to be set on the map, in accordance with an operation of the user on the environment setting terminal 20 (step S3).

[0064] Specifically, an area number for designating an area where a setting of air conditioning is desired is input by the user specifying the area number designated with a cursor in the map displayed on the display unit 202. Also, for example, the user inputs a value desired to be set by pressing a button for inputting coordinates for designating the area in the map displayed on the display unit 202. The input unit 203 receives a signal indicating an area designated according to an operation of the user.

[0065] Also, the user performs settings for designating the setting values of the requested environment settings including at least the temperature and the air volume at the designated position on the environment setting terminal 20.

[0066] The input unit 203 receives an input of requested environment settings including at least the designated temperature and air volume in accordance with the operation of the user on the environment setting terminal 20 (step S4). The input unit 203 writes the received requested environment settings to the storage unit 204 (step S5).

[0067] The storage unit 204 stores the requested environment settings of the user.

[0068] When the input unit 203 receives both the input of the position and the input of the requested environment settings, the communication unit 205 transmits user setting information in which the position and the requested environment settings received by the input unit 203 are associated to the air conditioning control device 30 (step S6).

[0069] The communication unit 301 receives the user setting information in which the position designated by the user in the map of the indoor in which the air conditioning indoor unit 10 is installed and the requested environment settings are associated from the environment setting terminal 20.

[0070] The control unit 302 generates a control signal for implementing the setting values indicated by the requested environment settings received by the communication unit 301 from the environment setting terminal 20. The control unit 302 transmits the generated control signal to the air conditioning indoor unit 10 via the communication unit 301.

[0071] The communication unit 101 receives a control

signal for implementing the setting values indicated by the requested environment settings from the air conditioning control device 30.

[0072] The blowing mechanism 102 generates and sends air of a temperature, an air volume, a wind direction, and the like according to the control signal received by the communication unit 101.

[0073] Also, in another embodiment of the present invention, the designation of a position on the map by the user may be performed by tapping or clicking the screen on an application or a web page displayed by the display unit 202. Also, in another embodiment of the present invention, the designation of the position on the map by the user may be performed by inputting an area number and coordinates assigned to a designated area from a keyboard.

[0074] Also, in another embodiment of the present invention, a position estimated on the basis of a signal used for communication by Bluetooth (registered trademark) performed by the environment setting terminal 20 or another terminal may be used for generating a map. For example, when a base station is installed in the indoor and the base station has received a signal from the environment setting terminal 20 or another terminal, it is determined that the user has approached in a certain distance range from the base station and the position of the base station may be set as a position of the user. Also, for example, a plurality of base stations may be installed in the indoor, a position designated by the user may be calculated as a position on a certain line from a difference between radio wave intensities of signals received by the base stations from the environment setting terminal 20 or another terminal, for example, when there are two base stations, and the position designated by the user may be calculated as a position according to the principle of three-point surveying when there are three or more base stations.

[0075] The air conditioning system 1 according to the embodiment of the present invention has been described above.

[0076] In the air conditioning system 1 according to an embodiment of the present invention, the environment setting terminal 20 is an environment setting terminal of an air conditioning control device for controlling the air conditioning indoor unit 10 in accordance with requested environment settings requested by the user. The environment setting terminal 20 includes the display unit 202 (an example of a map display unit) configured to display a map of an indoor in which the air conditioning indoor unit 10 is installed, the input unit 203 (an example of a position input unit) configured to receive an input of a position designated by the user on the map, the storage unit 204 configured to store the requested environment settings of the user, and the communication unit 205 (an example of a transmission unit) configured to transmit user setting information in which the position designated by the user on the map and the requested environment settings are associated to the air conditioning control de-

vice 30.

[0077] As described above, the environment setting terminal 20 includes the display unit 202, so that the user can easily designate any position in the indoor while viewing the map displayed on the display unit 202.

[0078] Also, in the air conditioning system 1 according to the embodiment of the present invention, the environment setting terminal 20 includes a map information acquisition unit 201. The map information acquisition unit 201 acquires information indicating a map of the indoor in which the air conditioning indoor unit 10 is installed.

[0079] As described above, the environment setting terminal 20 includes the map information acquisition unit 201, so that information indicating a map viewed by the user can be easily acquired.

[0080] Also, in another embodiment of the present invention, the environment setting terminal 20 is provided for each area in the map of the indoor in which the air conditioning indoor unit 10 is installed and the environment setting terminal 20 associates the area with the position. The user transmits user setting information from the environment setting terminal 20 associated with the area in the map that is the air conditioning setting target to the air conditioning control device 30.

[0081] In this manner, the user can reliably designate the area that is the air conditioning setting target in the map by transmitting the user setting information from the environment setting terminal 20 associated with the position that is the air conditioning setting target to the air conditioning control device 30.

[0082] Also, the display unit 202 according to another embodiment of the present invention may display a map as a three-dimensional space instead of displaying a map in a two-dimensional plane. In this case, the position designated by the user may be a position in a three-dimensional space. The air conditioning control device 30 may control the air conditioning of the position in the three-dimensional space designated by the user.

[0083] Also, in the process according to the embodiment of the present invention, the order of processing may be changed in a range where an appropriate process is performed.

[0084] Each of the storage unit and the storage device (including a register and a latch) according to the embodiment of the present invention may be provided anywhere in a range in which appropriate information is transmitted and received. Also, a plurality of storage units and a plurality of storage devices may exist in a range in which appropriate information is transmitted and received and may store data in a distributed manner.

[0085] Although the embodiment of the present invention has been described, the air conditioning indoor unit 10, the environment setting terminal 20, the air conditioning control device 30 described above and another control device may have a computer system therein. The process of processing described above is stored in a computer-readable recording medium in the form of a program, and the above-described processing is per-

formed by the computer reading and executing the program. A specific example of a computer is shown below. Fig. 12 is a schematic block diagram showing a configuration of a computer according to at least one embodiment.

[0086] The computer 5 includes a CPU 6, a main memory 7, a storage 8, and an interface 9, as shown in FIG. 12.

[0087] For example, each of the air conditioning indoor unit 10, the environment setting terminal 20, the air conditioning control device 30, and the other control device described above is mounted on the computer 5. An operation of each processing unit described above is stored in the storage 8 in the form of a program. The CPU 6 reads the program from the storage 8, loads the program to the main memory 7, and executes the above-described processing according to the program. Also, the CPU 6 secures a storage area corresponding to each of the above-described storage units in the main memory 7 in accordance with the program.

[0088] Examples of the storage 8 include a hard disk drive (HDD), a solid state drive (SSD), a magnetic disk, a magneto-optical disk, a compact disc read only memory (CD-ROM), a digital versatile disc read only memory (DVD-ROM), a semiconductor memory, and the like. The storage 8 may be an internal medium directly connected to a bus of the computer 5 or may be an external medium connected to the computer 5 via the interface 9 or a communication circuit. Also, when this program is distributed to the computer 5 through a communication circuit, the computer 5 receiving the distributed program may load the program to the main memory 7 and execute the above-described processing. In at least one embodiment, the storage 8 is a non-transitory tangible storage medium.

[0089] Also, the above-described program may be a program for implementing some of the above-described functions. Further, the above-described program may be a file capable of implementing the above-described function in combination with a program already recorded on the computer system, i.e., a so-called differential file (differential program).

[0090] While several embodiments of the present invention have been described, these embodiments have been presented by way of example and are not intended to limit the scope of the invention. These novel embodiments can be implemented in various other additions, and various omissions, substitutions, and modifications can be made without departing from the spirit of the invention.

[Industrial Applicability]

[0091] According to an environment setting terminal, an air conditioning system, a control method, and a program based on embodiments of the present invention, a user can easily designate a position in an indoor that is an air conditioning setting target when an air conditioning setting process is performed.

[Reference Signs List]

[0092]

1 Air conditioning system
5 Computer
6 CPU
7 Main memory
8 Storage
9 Interface
10 Air conditioning indoor unit
20 Environment setting terminal
30 Air conditioning control device
101, 205, 301 Communication unit
102 Blowing mechanism
201 Map information acquisition unit
202 Display unit
203 Input unit
204 Storage unit
302 Control unit

Claims

1. An environment setting terminal for setting requested environment settings in an air conditioning control device that controls an air conditioning indoor unit in accordance with the requested environment settings requested by a user, the environment setting terminal comprising:
 - a map display unit configured to display a map of an indoor in which the air conditioning indoor unit is installed;
 - a position input unit configured to receive an input of a position designated by the user on the map;
 - a storage unit configured to store the requested environment settings of the user; and
 - a transmission unit configured to transmit user setting information in which the position and the requested environment settings are associated to the air conditioning control device.
2. The environment setting terminal according to claim 1, comprising an environment input unit configured to receive the requested environment settings requested by the user, wherein the storage unit stores the requested environment settings received by the environment input unit.
3. The environment setting terminal according to claim 1 or 2, comprising a map information acquisition unit configured to acquire information indicating the map of the indoor in which the air conditioning indoor unit is installed,

wherein the map display unit displays a map included in information indicating the map acquired by the map information acquisition unit, and

wherein the position input unit receives an input of a position designated by the user in the map acquired by the map information acquisition unit.

4. The environment setting terminal according to claim 3, wherein the map information acquisition unit acquires information indicating the map while a predetermined person is moving in the indoor in which the air conditioning indoor unit is installed.
5. The environment setting terminal according to claim 3, wherein the map information acquisition unit acquires information indicating the map from layout information or CAD information of the indoor in which the air conditioning indoor unit is installed.
6. An air conditioning system comprising:

an air conditioning indoor unit;
the environment setting terminal according to any one of claims 1 to 5; and
an air conditioning control device configured to control the air conditioning indoor unit on the basis of the user setting information in which the position designated by the user received from the environment setting terminal is associated with the requested environment settings requested by the user.

7. A control method to be performed by an environment setting terminal for setting requested environment settings in an air conditioning control device that controls an air conditioning indoor unit in accordance with the requested environment settings requested by a user, the control method comprising the steps of:

displaying a map of an indoor in which the air conditioning indoor unit is installed;
receiving an input of a position designated by the user on the map;
storing the requested environment settings of the user; and
transmitting user setting information in which the position and the requested environment settings are associated to the air conditioning control device.

8. A program which causes a computer of an environment setting terminal for setting requested environment settings in an air conditioning control device that controls an air conditioning indoor unit in accordance with the requested environment settings requested by a user to execute the steps of:

displaying a map of an indoor in which the air
conditioning indoor unit is installed;
receiving an input of a position designated by
the user on the map;
storing the requested environment settings of 5
the user; and
transmitting user setting information in which the
position and the requested environment settings
are associated to the air conditioning control de-
vice. 10

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FIG. 1

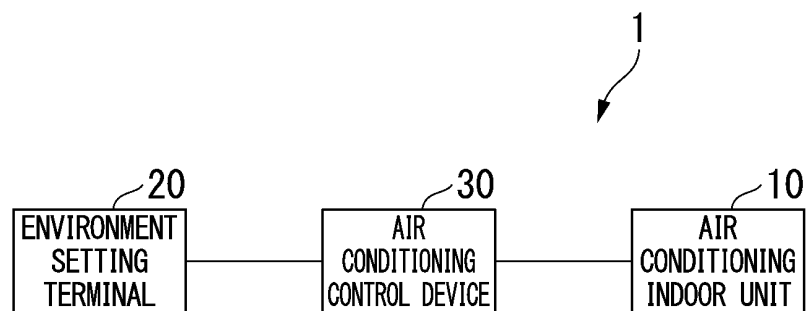


FIG. 2

				1	2	3	
				4	5	6	7
8	9	10	11	12	13	14	15
16	17	18	19	20	21	22	23
24	25	26	27	28	29	30	31

FIG. 3

● (x12, y12)

FIG. 4

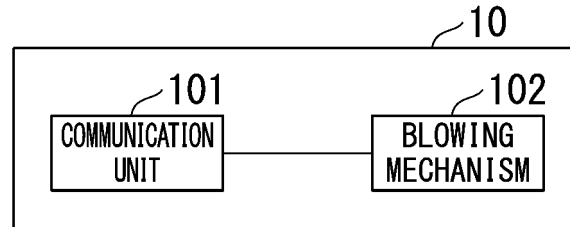


FIG. 5

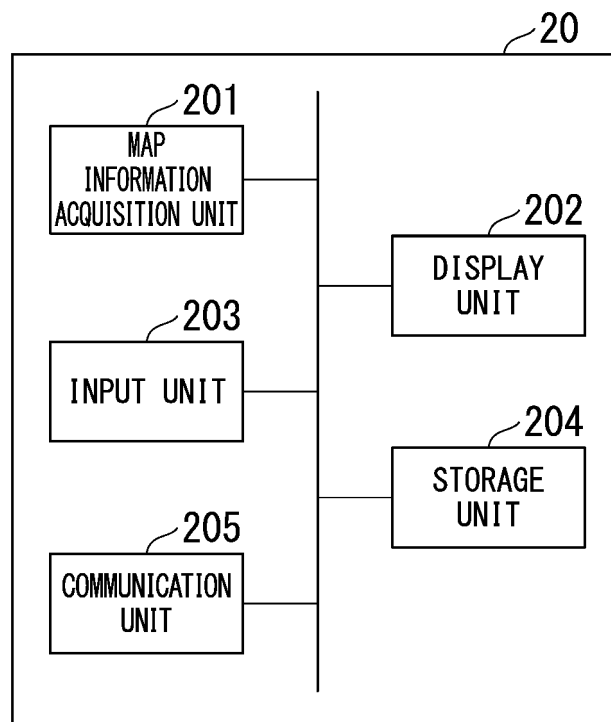


FIG. 6

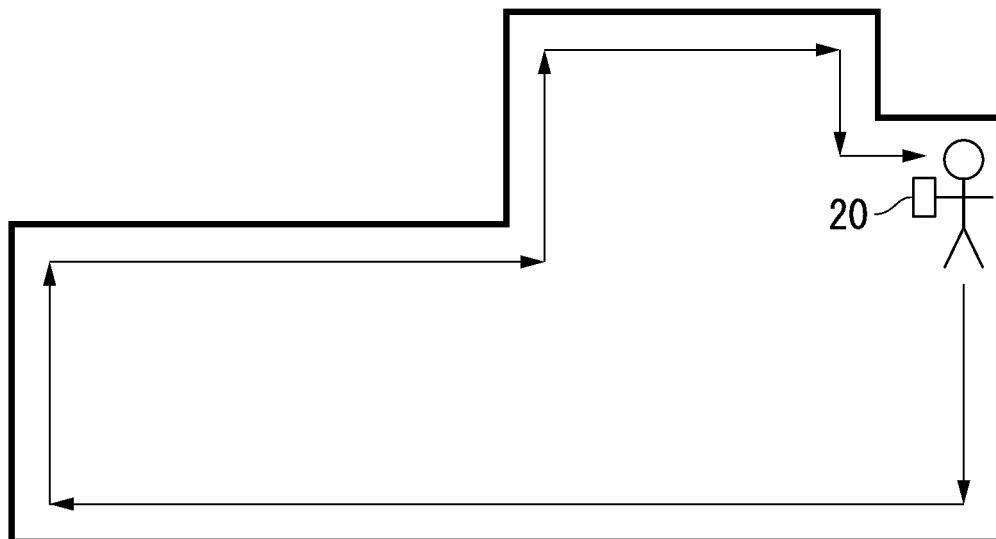


FIG. 7

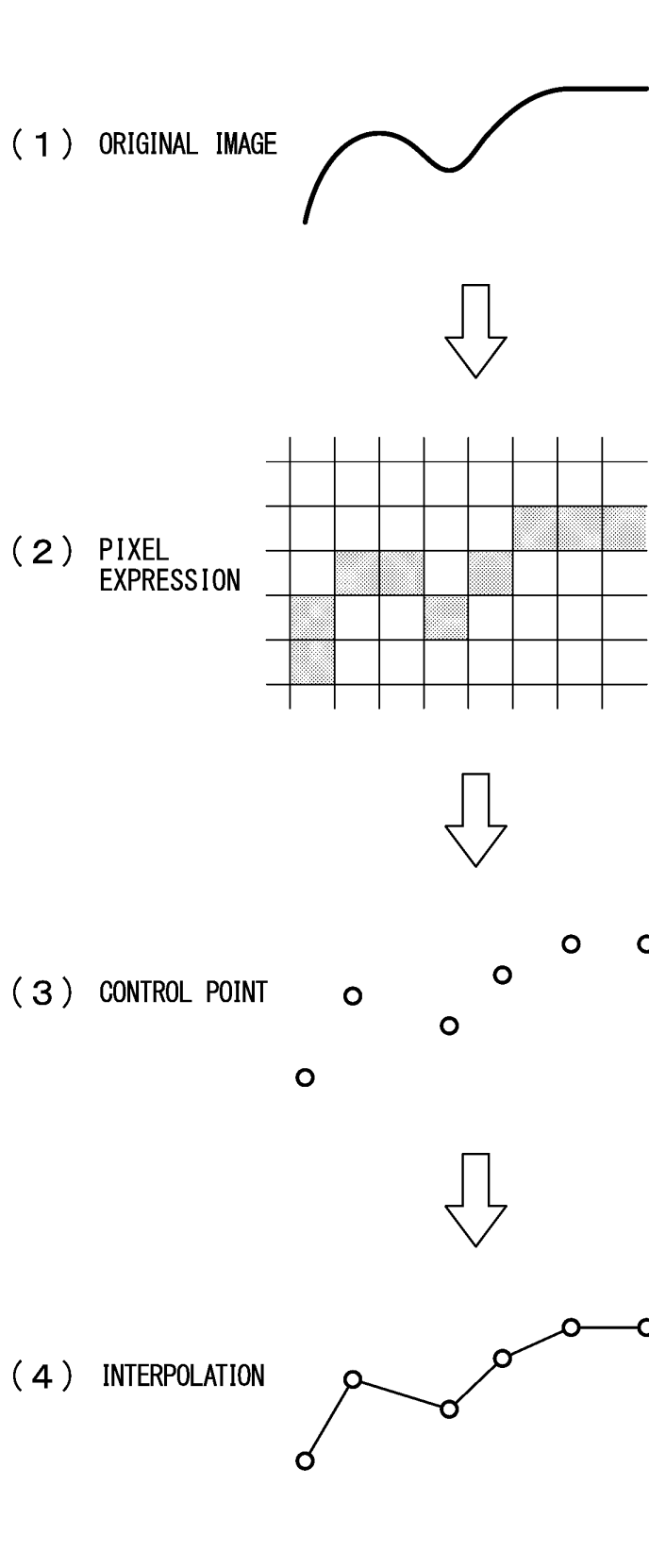


FIG. 8

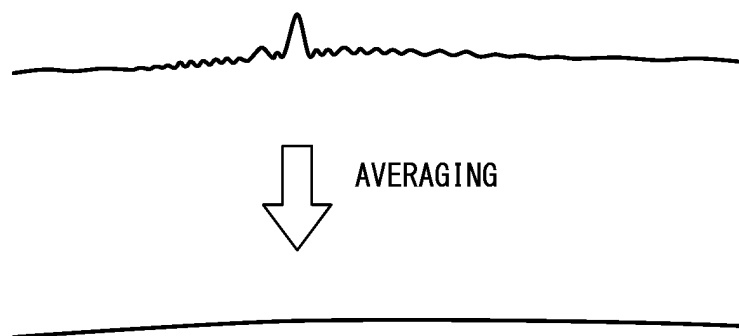


FIG. 9

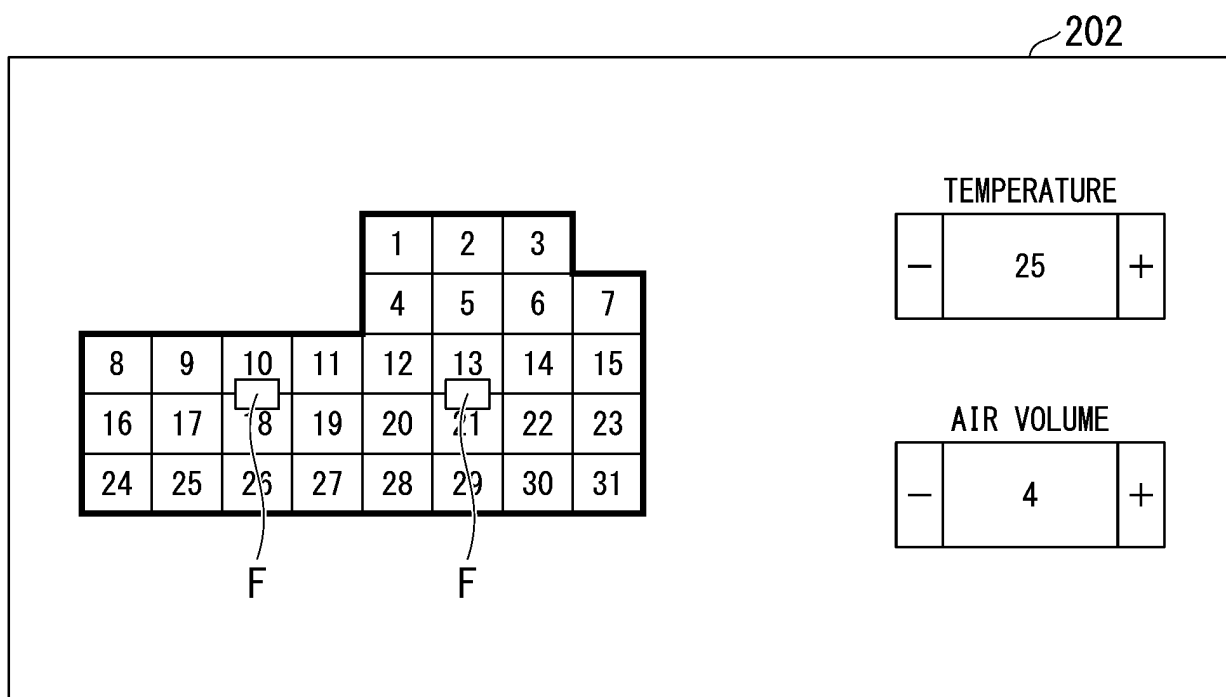


FIG. 10

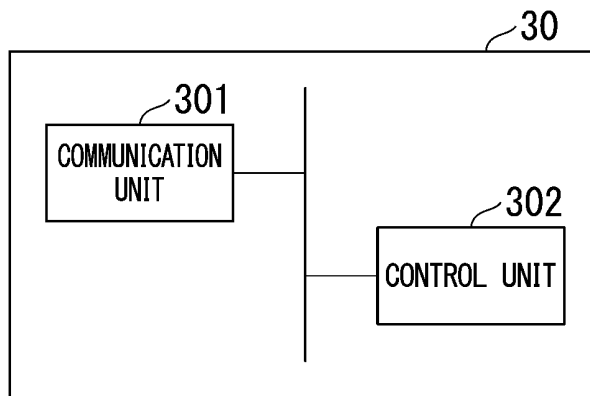


FIG. 11

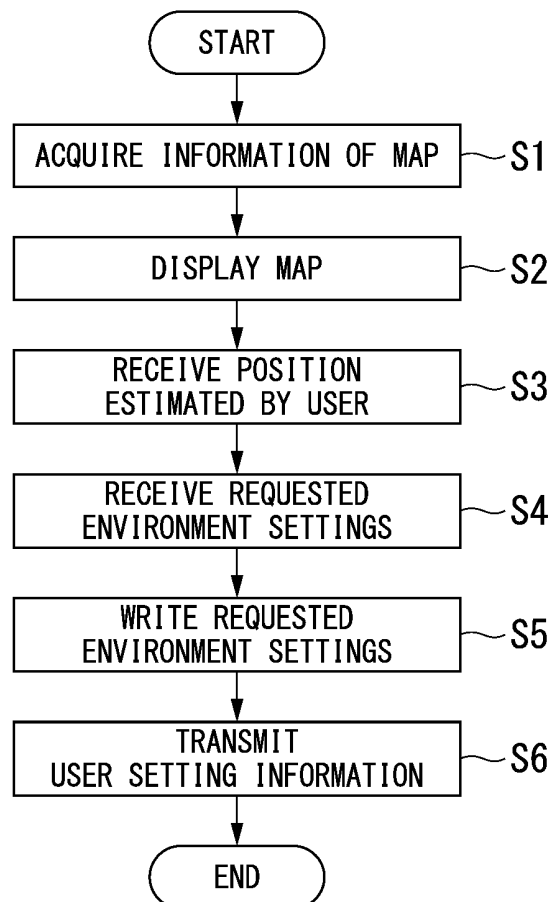
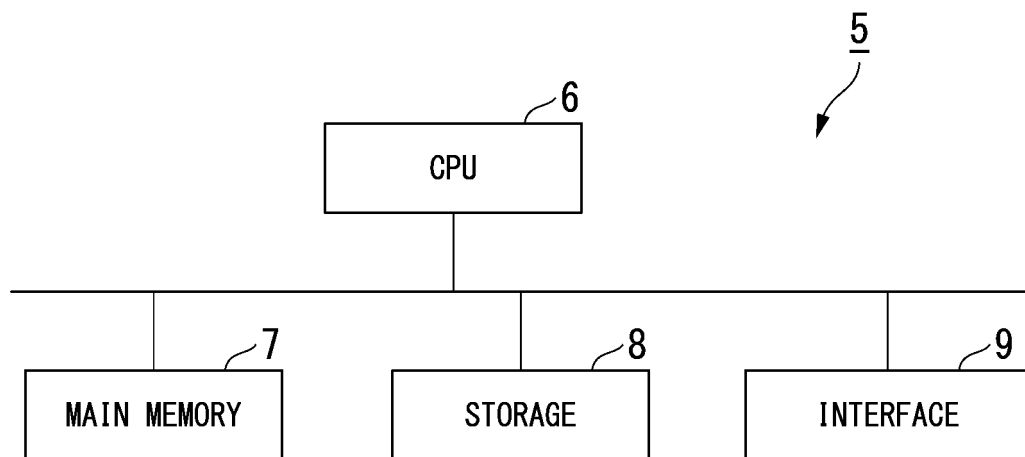


FIG. 12



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2018/019974

A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl. F24F11/56(2018.01) i, F24F11/63(2018.01) i

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Int.Cl. F24F11/56, F24F11/63

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Published examined utility model applications of Japan 1922-1996

Published unexamined utility model applications of Japan 1971-2018

Registered utility model specifications of Japan 1996-2018

Published registered utility model applications of Japan 1994-2018

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2013-76493 A (HITACHI APPLIANCES, INC.) 25	1-8
Y	April 2013, paragraphs [0026], [0028], [0055]-[0076], fig. 9-13, 19 & CN 103032935 A	4-5
Y	JP 2010-237041 A (YAMAHA CORP.) 21 October 2010, paragraph [0024] (Family: none)	4
Y	JP 2001-325308 A (SEKISUI HOUSE, LTD.) 22 November 2001, paragraphs [0015]-[0017] (Family: none)	5



Further documents are listed in the continuation of Box C.



See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search

04 July 2018 (04.07.2018)

Date of mailing of the international search report

17 July 2018 (17.07.2018)

Name and mailing address of the ISA/

Japan Patent Office

3-4-3, Kasumigaseki, Chiyoda-ku,

Tokyo 100-8915, Japan

Authorized officer

Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2018/019974

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2015-148410 A (TOSHIBA CORP.) 20 August 2015, entire text, all drawings (Family: none)	1-8
A	JP 2015-215146 A (PANASONIC INTELLECTUAL PROPERTY CORPORATION OF AMERICA) 03 December 2015, entire text, all drawings & US 2015/0330649 A1, entire text, all drawings & CN 105091259 A	1-8
A	JP 2016-21091 A (OMRON CORP.) 04 February 2016, entire text, all drawings & US 2016/0012309 A1, entire text, all drawings & EP 2966371 A1 & CN 105276760 A & KR 10-2016-0007349 A	1-8
A	JP 2003-116757 A (MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.) 22 April 2003, entire text, all drawings (Family: none)	1-8

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REFERENCES CITED IN THE DESCRIPTION

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- JP 2017143482 A [0002]
- JP 4737037 B [0004]