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(71) Applicant: **LG Electronics Inc.**
Seoul (KR)

(72) Inventor: **Yang, Seung Hoon**
Gyoungsangnam-do 641-711 (KR)

(74) Representative: **Palmer, Jonathan R.**
Boult Wade Tennant
Verulam Gardens
70 Gray's Inn Road
London WC1X 8BT (GB)

(54) **Indoor unit of air conditioner**

(57) Provided is an indoor unit of an air conditioner. The indoor unit includes a main body receiving a fan for sucking an indoor air and a heat exchanger in which the sucked indoor air is heat-exchanged with refrigerant, and having a front intake port, a front panel movably connected to a front side of the main body to selectively open and close the front surface intake port, a light emitting unit provided inside the main body, a reflection member provided at a rear side of the front panel to reflect light emitted from the light emitting unit, and a display provided on a side of the front surface of the main body, the display allowing an operation mode of the indoor unit to be indicated by the light reflected from the reflection member.

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Description

BACKGROUND TO THE INVENTION

[0001] Embodiments relate to an indoor unit of an air conditioner. Generally, an air conditioner is a cooling/heating apparatus that cools or heats air within an inner space of a building, etc.

[0002] The air conditioner includes an outdoor unit receiving a compressor and an indoor unit installed at an indoor space to perform heat-exchange between air and refrigerant. According to the types of air conditioners, the indoor unit and the outdoor unit may be integrated in one body.

[0003] An indoor heat exchanger, a fan assembly, and a filter for filtering sucked air are installed in the indoor unit. The indoor unit is classified into a wall-mounted type, a floor-mounted type, and a window type according to an installation position thereof.

[0004] In a related art indoor unit, a separate display device for displaying an operation state of the indoor unit is generally provided on a side of a front surface of the indoor unit. For example, a liquid crystal display (LCD) or a plasma display panel (PDP) display module for displaying a cooling mode or a heating mode may be installed on the front surface of the indoor unit.

[0005] At this time, a separate space in which the display module is installed must be provided on a front portion of the indoor unit, and inner space enough to receive the display module is required.

[0006] Also, a total price of the indoor unit increases due to a price of the display module.

SUMMARY OF THE INVENTION

[0007] Embodiments preferably provide an indoor unit of an air conditioner in which a design of a front portion can be neatly finished.

[0008] In one embodiment, an indoor unit of an air conditioner comprises: a main body receiving or housing a fan for sucking an indoor air and a heat exchanger in which the sucked indoor air is heat-exchanged with refrigerant, and having a front intake port; a front panel movably connected to a front side of the main body to selectively open and close the front intake port; a light emitting unit provided inside the main body; a reflection member provided at a rear side of the front panel to reflect light emitted from the light emitting unit; and a display provided on a side of the front surface of the main body, the display allowing an operation mode of the indoor unit to be indicated by the light reflected from the reflection member.

[0009] The details of one or more embodiments are set forth in the accompanying drawings and the description below. Other features will be apparent from the description and drawings, and from the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010]

FIG. 1 is a cross-sectional view illustrating an indoor unit of an air conditioner according to an embodiment.

FIG. 2 is a perspective view illustrating an operation state of an indoor unit of an air conditioner according to an embodiment.

FIG. 3 is an enlarged perspective view of a portion A in FIG. 2.

FIG. 4 is a perspective view of an indoor unit taken along line I-I' of FIG. 3.

FIG. 5 is a cross-sectional view taken along line I-I' of FIG. 3.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0011] Reference will now be made in detail to the embodiments of the present disclosure, examples of which are illustrated in the accompanying drawings.

[0012] In the following detailed description of the preferred embodiments, reference is made to the accompanying drawings that form a part hereof, and in which is shown by way of illustration specific preferred embodiments in which the invention may be practiced. These embodiments are described in sufficient detail to enable those skilled in the art to practice the invention, and it is understood that other embodiments may be utilized and that logical structural, mechanical, electrical, and chemical changes may be made without departing from the spirit or scope of the invention. To avoid detail not necessary to enable those skilled in the art to practice the invention, the description may omit certain information known to those skilled in the art. The following detailed description is, therefore, not to be taken in a limiting sense, and the scope of the present invention is defined only by the appended claims.

[0013] FIG. 1 is a cross-sectional view illustrating an indoor unit of an air conditioner according to an embodiment.

[0014] Referring to FIG. 1, the indoor unit 10 of the air conditioner includes a chassis 11, a main body, a base 12, and a front panel 14. A flow guide 111 for generating airflow is provided on a front surface of the chassis 11. The main body includes a front frame 13 coupled to a front portion of the chassis 11. An intake grill 131 is provided on an upper surface of the front frame 13. The base 12 is provided on a back surface of the chassis 11 and fixed to an installation wall surface. The front panel 14 is movably coupled to a front surface of the front frame 13.

[0015] The indoor unit 10 further includes an inner panel 15, a heat exchanger 19, a fan 20, and a discharge grill 16. The inner panel 15 is link-coupled to a back surface of the front panel 14 and rotatably provided to the front frame 13. The heat exchanger 19 is disposed be-

tween the front frame 13 and the chassis 11. The fan 20 is provided at a lower side of the heat exchanger 19 to suck and discharge indoor air. The discharge grill 16 supports a lower end of the heat exchanger 19 and includes a discharge hole.

[0016] The indoor unit 10 further includes a discharge vane 21, a discharge louver 22, a bottom plate 23, and a tubing holder 24. The discharge vane 21 selectively shields the discharge hole. The discharge louver 22 is provided in the discharge hole to adjust a discharge direction of air together with the discharge vane 21. The bottom plate 23 shields a piping passing through a lower end of the indoor unit 10. The tubing holder 24 is rotatably coupled to the chassis 11 and supports the piping.

[0017] The indoor unit 10 further includes a pre-filter 17 and a dust-collecting filter 18. The pre-filter 17 filters air sucked through a front intake port of the front frame 13 and the intake grill 131. The dust-collecting filter 18 is provided between the pre-filter 17 and the heat exchanger 19.

[0018] FIG. 2 is a perspective view illustrating an operation state of an indoor unit of an air conditioner according to an embodiment.

[0019] Referring to FIG. 2, in the indoor unit 10 of the air conditioner, the discharge grill 16 including the discharge hole is disposed at a lower side of the indoor unit 10. That is, the discharge hole is disposed in a bottom surface of the indoor unit 10, and the discharge vane 21 and the discharge louver 22 are disposed in the discharge hole. Thus, sucked indoor air passes through the heat exchanger 19, and then, is discharged through the bottom surface of the indoor unit 10.

[0020] In order to suck the indoor air, the front panel 14 ascends while the front panel 14 is rotated by a link member 26. In detail, the front panel 14 ascends in a state in which an upper end of the front panel 14 is inclined forwardly due to a rotation of the link member 26. Thus, the indoor air is sucked through the intake grill 131, and also, the indoor air is sucked through a space between the front frame 13 and the front panel 14. At this time, the inner panel 15 disposed on the back surface of the front panel 14 is fixedly maintained on a front surface of the front frame 13.

[0021] A moving sensor assembly 27 for detecting a movement of a human body is disposed on an edge portion of a bottom surface of the indoor unit 10.

[0022] In detail, the moving sensor assembly 27 is inserted inside the indoor unit 10 in a state where the indoor unit 10 does not operate. When the indoor unit 10 operates, the moving sensor assembly 27 descends to protrude from a bottom surface of the indoor unit 10. The moving sensor assembly 27 is rotatably disposed at a predetermined angle with respect to a vertical axis.

[0023] The moving sensor assembly 27 protrudes from the bottom surface of the indoor unit 10 by a predetermined length and is disposed rotatably in left and right directions. Thus, a range capable of detecting the movement of the human body increases.

[0024] FIG. 3 is an enlarged perspective view of a portion A in FIG 2.

[0025] Referring to FIG. 3, a separate display panel for displaying an operation state is not provided in the indoor unit 10 according to an embodiment. Thus, a front surface of the front panel 14 is provided in a smooth plate shape to elegantly treat an outer appearance.

[0026] In detail, an indication part for indicating an operation state, e.g., a character or symbol is printed on a side edge of the front portion of the indoor unit 10, i.e., a front surface of an edge portion of the front frame 13.

[0027] For example, as illustrated in FIG. 3, a character "cooling" indicating a cooling mode and a character "heating" indicating a heating mode are printed on the fronts surface of the front frame 13. A reflection member for reflecting light onto the characters is disposed on a back surface of the front frame 14. A light emitting device for emitting light having a specific color is provided inside the indoor unit 10. Hereinafter, configurations of the reflection member and the light emitting device will be described in detail with reference to drawings.

[0028] FIG. 4 is a perspective view of an indoor unit taken along line I-I' of FIG. 3, and FIG. 5 is a cross-sectional view taken along line I-I' of FIG. 3. That is, FIG. 3 is a cross-sectional view illustrating a path of light emitted from the light emitting device.

[0029] Referring to FIGS. 4 and 5, a light emitting unit 60 emitting light having a specific color is installed inside the indoor unit 10 according to an embodiment. The reflection member 50 is attached to the back surface of the front panel 14 disposed at a position corresponding to that the light emitting unit 60. A through hole 151 is defined in a lower end of the inner panel 15 such that light emitted from the light emitting unit 60 passes through the through hole 151 to collide with the reflection member 50. The through hole 151 may be provided by the number corresponding to that of the character for indicating the operation state of the indoor unit 10.

[0030] In detail, the light emitting unit 60 is provided between the inner panel 15 and the front frame 13. The light emitting unit 60 includes a housing 63, a circuit board 62, and a light emitting device 61. The housing 63 is fixed to the back surface of the inner panel 15. The circuit board is seated on a bottom surface of inside of the housing 63. The light emitting device 61 is installed on an upper surface of the circuit board 62. The light emitting device 61 has the number corresponding to that of the through hole 151, and may be disposed in a direct rear direction of the through hole 151. As illustrated in drawings, the light emitting device 61 may be inclinedly or vertically disposed.

[0031] The reflection member 50 has an inclined surface 51 to reflect the light onto the character printed on the front surface of the front frame 13. Thus, the light emitted from the light emitting device 61 passes through the through hole 151 to collide with the inclined surface 51. The light colliding with the inclined surface 51 is reflected to a side direction of the indoor unit 10 to shine

the character. On the other hand, the reflection member 50 itself may be inclinedly disposed on the back surface of the front panel 14, and a portion of a surface of the reflection member 50 may be inclined.

[0032] The light emitted from the light emitting device 61 may be shined on the character with a soft glow using a color adequate to an operation mode. For example, in case of the cooling mode, a blue color having a lower illuminance can be emitted to know the cooling mode even if a user does not recognize the character. In case of the heating mode, a red color having a lower illuminance can be emitted to recognize the heating mode.

[0033] Various light emitting devices may be used as the light emitting device 61. For example, light emitting devices such as an LED and a LCD may be applied, and a filament bulb may be applied. A kind of light emitting device 61 is not limited.

[0034] In a state where the front panel 14 is closed, the reflection member 50 is disposed under the light emitting unit 60. When an operation of the indoor unit starts to open the intake port while the front panel ascends, the reflection member 50 is disposed on a front surface of the light emitting unit 60. The light emitted from the light emitting device 61 passes through the through hole 151 and is reflected from the reflection member 50. The light is reflected to the front surface of the front frame 13 on which the character indicating the operation mode is printed.

[0035] According to the embodiment, since the operation state of the indoor unit can be indicated without requiring the display module on the front portion of the indoor unit, a design of the front portion of the indoor unit can be neatly finished.

[0036] Also, since the expensive display module is not required, manufacturing costs can be reduced.

[0037] While the present disclosure has been particularly shown and described with reference to exemplary embodiments thereof, it will be understood by those of ordinary skill in the art that various changes in form and details may be made therein without departing from the scope of the present invention as defined by the following claims.

Claims

1. An indoor unit of an air conditioner, the indoor unit comprising:

a main body receiving a fan for sucking an indoor air and a heat exchanger in which the sucked indoor air is heat-exchanged with refrigerant, and having a front intake port;
a front panel movably connected to a front side of the main body to selectively open and close the front intake port;
a light emitting unit provided inside the main body;
a reflection member provided at a rear side of the front panel to reflect light emitted from the light emitting unit; and
a display provided on a side of the front surface of the main body, the display allowing an operation mode of the indoor unit to be indicated by the light reflected from the reflection member.

2. The indoor unit according to claim 1, wherein the display is printed on an edge portion of the main body.

3. The indoor unit according to claim 2, wherein the display comprises a character or symbol.

4. The indoor unit according to claim 1, wherein the reflection member is connected to the front panel and moved together with the front panel.

5. The indoor unit according to claim 4, wherein the reflection member is selectively disposed on a front side of the light emitting unit due to movement of the front panel.

6. The indoor unit according to claim 1, wherein the reflection member is inclinedly mounted on the rear side of the front panel such that the light emitted from the light emitting unit is reflected toward the display.

7. The indoor unit according to claim 1, wherein the reflection member has an inclined surface such that the light emitted from the light emitting unit is reflected toward the display.

8. The indoor unit according to claim 1, wherein the light emitting unit comprises:

a housing received inside the main body;
a circuit board mounted inside the housing; and
a light emitting device mounted on the circuit board.

9. The indoor unit according to claim 8, wherein the display comprises characters displaying at least cooling mode and heating mode and spaced each other by a predetermined distance, and the light emitting device is provided by the number corresponding to that of the character.

10. The indoor unit according to claim 1, wherein a color of light emitted from the light emitting unit is varied according to an operation mode of the indoor unit.

Fig.1

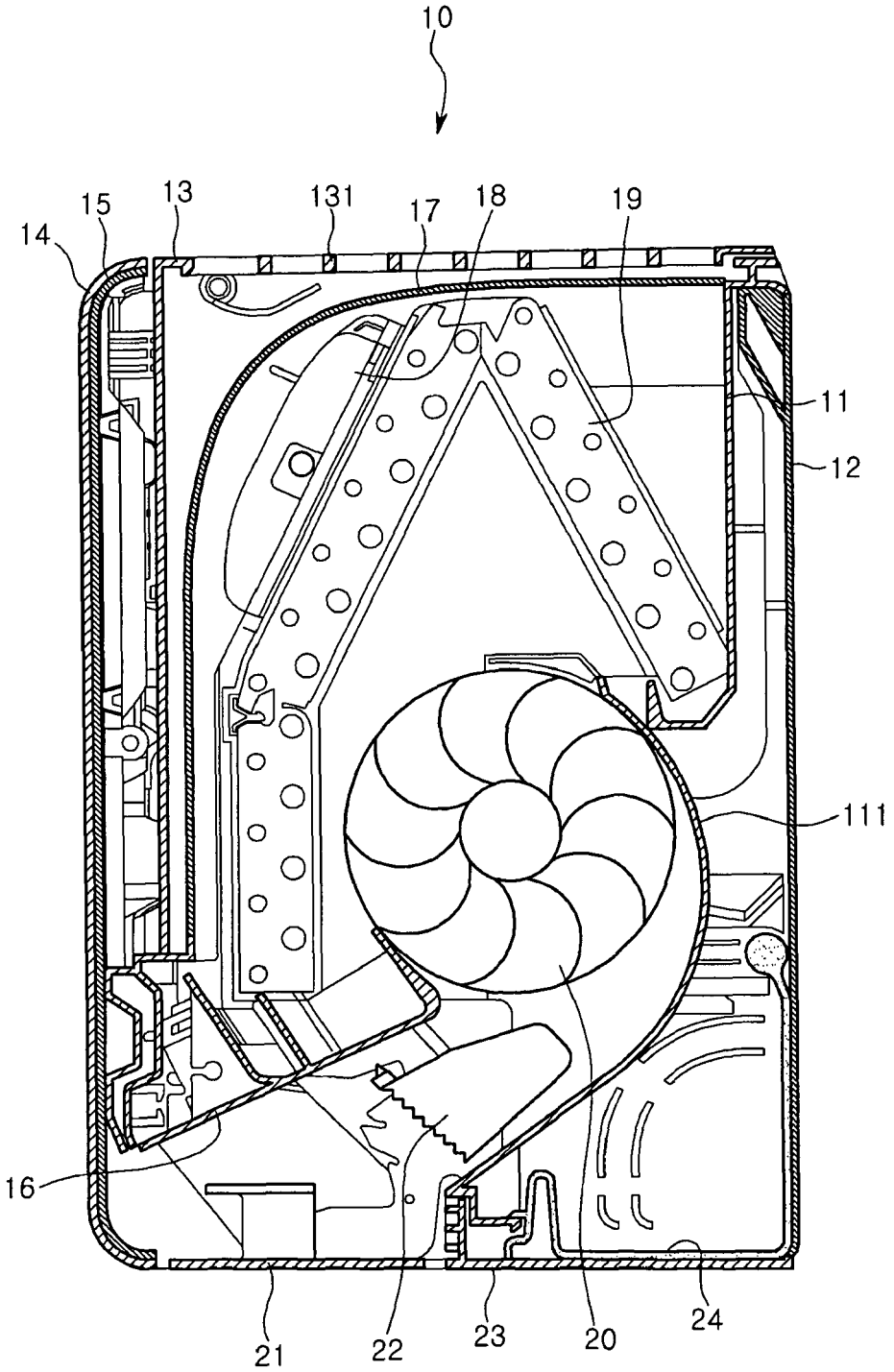

Fig.2

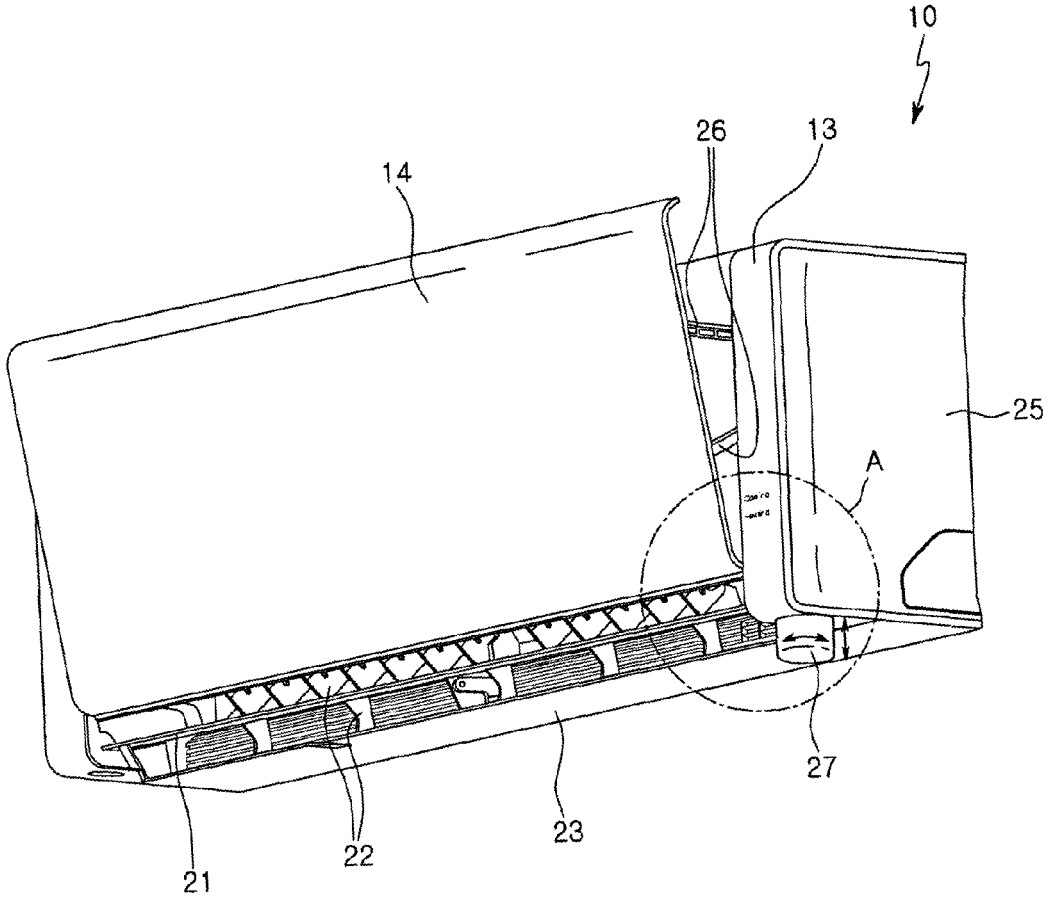

Fig.3

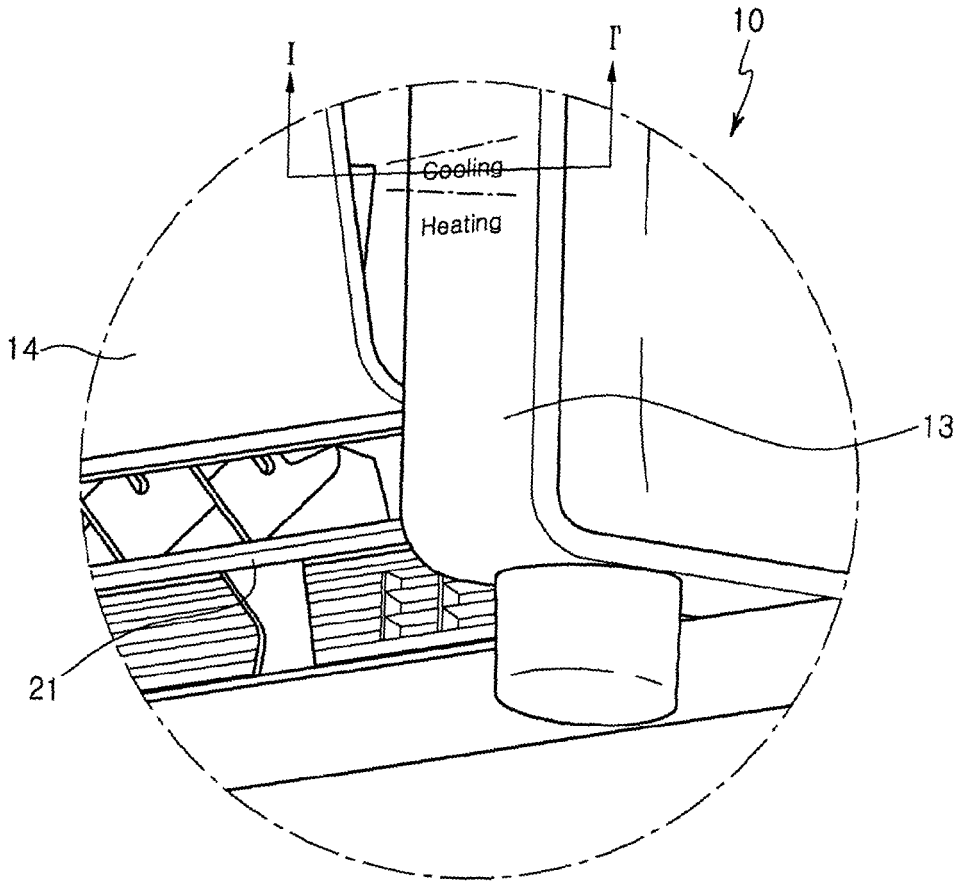

Fig.4

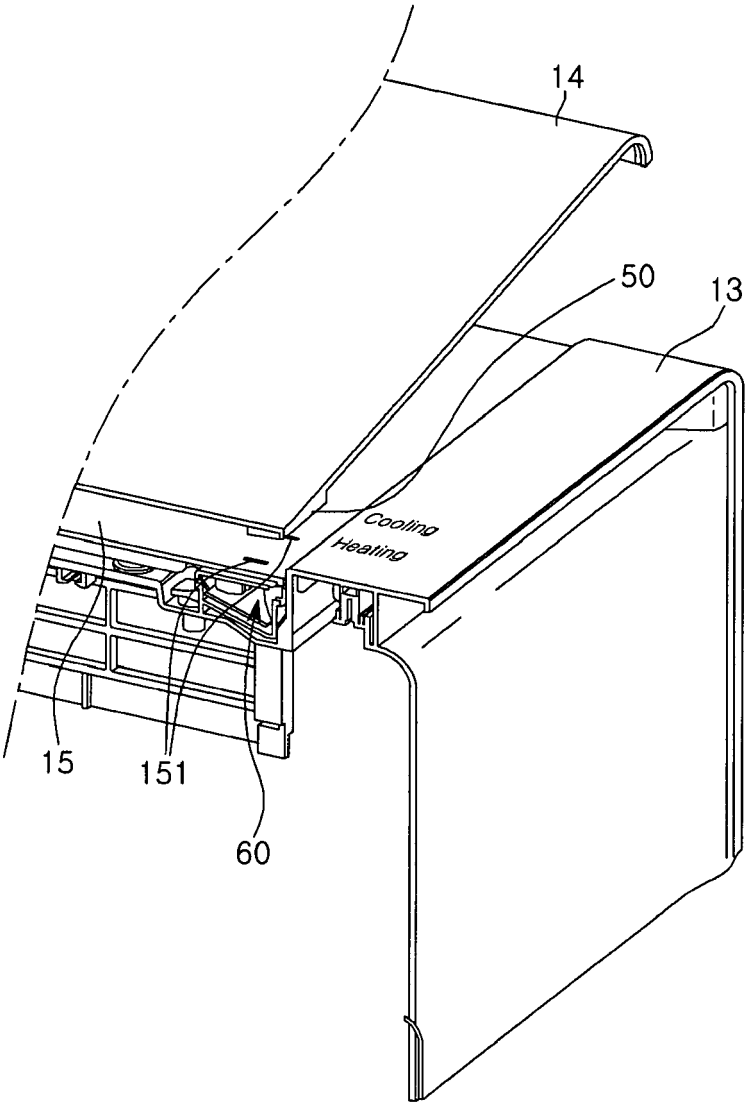

Fig.5