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(54) **Air conditioner**

(57) There is provided an air conditioner. The air conditioner includes a rear cabinet, a front cabinet, a blower fan, a heat exchanger, and a panel assembly. The front cabinet is coupled to a front of the rear cabinet, and includes an intake port formed at a lower side portion thereof and a discharge port formed at an upper side portion thereof. The blower fan is installed in an inner lower portion of the rear cabinet for suctioning indoor air. The heat exchanger is installed above the blower fan for exchanging heat with the suctioned indoor air. The panel assembly is installed on a front of the front cabinet for interchangeably mounting a picture, photograph, etc.thereto.

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DescriptionField of the Invention

5 **[0001]** The present invention relates to an air conditioner, and more particularly, to a standing indoor unit of an air conditioner for allowing pictures or photographs displayed at the front thereof to be easily interchanged, thus providing the functional benefits of an air conditioner with an added aesthetic factor for interior decoration.

Description of the Related Art

10 **[0002]** Refrigerants circulating inside air conditioners undergo compression, condensing, expansion, and evaporation stages of a refrigeration cycle. In an air conditioner, refrigerant is first compressed to become high in temperature and pressure, and loses heat to the outside in a condenser, after which it passes through an expansion valve, gradually cooling and depressurizing. The cooled and depressurized refrigerant flows through an evaporator, absorbing heat along the way, and is then recycled to the compressor.

15 **[0003]** Here, the compression, condensing, and expansion stages occur in an outdoor unit of an air conditioner; and the evaporation stage occurs in an indoor unit by virtue of a blower fan and a heat exchanger.

20 **[0004]** Air conditioners are grouped into two basic types: single unit air conditioners that consist of a single unit which performs the entire refrigeration cycle, installed in a wall opening such as a window, and split system air conditioners that have a separate indoor and outdoor unit that are respectively installed indoors and outdoors.

25 **[0005]** Such air conditioner indoor units according to the related art have front portions that function only as covers. That is, a front cover installed at the front of an indoor unit functions to prevent components, such as a blower fan, heat exchanger, etc., from being exposed to the outside, as well as preventing electrocution or injury of children who may otherwise stick their hands inside the unit. Accordingly, the front of an indoor unit has a monotonous and stoic feel, and does not harmonize well with an interior.

SUMMARY OF THE INVENTION

30 **[0006]** Accordingly, the present invention is directed to an air conditioner that addresses one or more problems due to limitations and disadvantages of the related art.

[0007] It would be desirable to provide an air conditioner indoor unit with a structure that allows easy installation and removal of pictures or photographs to and from its blank front cover, so that the unit fulfills its air conditioning duties, as well as complements the decor of an interior space.

35 **[0008]** Additional advantages, objects, and features of the invention will be set forth in part in the description which follows and in part will become apparent to those having ordinary skill in the art upon examination of the following or may be learned from practice of the invention. The objectives and other advantages of the invention may be realized and attained by the structure particularly pointed out in the written description and claims hereof as well as the appended drawings.

40 **[0009]** Accordingly, the invention provides an air conditioner that includes: a rear cabinet; a front cabinet coupled to a front of the rear cabinet, and including an intake port formed at a lower side portion thereof and a discharge port formed at an upper side portion thereof; a blower fan installed in an inner lower portion of the rear cabinet for suctioning indoor air; a heat exchanger installed above the blower fan for exchanging heat with the suctioned indoor air; and a panel assembly installed on a front of the front cabinet for interchangeably mounting an picture, photograph, etc. thereto.

45 **[0010]** It is to be understood that both the foregoing general description and the following detailed description of the present invention are exemplary and explanatory and are intended to provide further explanation of the invention as claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

50 **[0011]** The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this application, illustrate embodiment(s) of the invention and together with the description serve to explain the principle of the invention. In the drawings:

55 Fig. 1 is a frontal, three-quarter perspective view of a standing air conditioner indoor unit with a panel assembly according to the present invention;

Fig. 2 is an exploded perspective view of the standing air conditioner indoor unit in Fig. 1;

Fig. 3 is a perspective view of a panel assembly according to the first embodiment of the present invention;

Fig. 4 is a perspective view of a panel assembly according to the second embodiment of the present invention;

Fig. 5 is a perspective view of a panel assembly according to the third embodiment of the present invention;
 Fig. 6 is a perspective view of a panel assembly according to the fourth embodiment of the present invention;
 Fig. 7 is a perspective view of a standing air conditioner indoor unit with a panel assembly according to the fifth embodiment of the present invention; and
 Fig. 8 is a perspective view of a panel assembly according to the sixth embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0012] Reference will now be made in detail to the preferred embodiments of the present invention, examples of which are illustrated in the accompanying drawings. Wherever possible, the same reference numbers will be used throughout the drawings to refer to the same or like parts.

[0013] Fig. 1 is a frontal, three-quarter perspective view of a standing air conditioner indoor unit with a panel assembly according to the present invention, and Fig. 2 is an exploded perspective view of the standing air conditioner indoor unit in Fig. 1.

[0014] Referring to Figs. 1 and 2, the standing air conditioner indoor unit 100 according to the present invention includes a front cabinet 110, a rear cabinet 150 coupled at the rear of the front cabinet 110, a heat exchanger 130 mounted within and at the front of the rear cabinet 150 to exchange heat with indoor air, a blower fan installed below the heat exchanger 130 to suction indoor air, a HEPA filter 120 and an air filter 121 inserted in a lower front portion of the front cabinet 110 to filter impurities from indoor air, and a panel assembly 200 mounted to the front of the front cabinet 110 to interchangeably attach pictures or photographs thereon.

[0015] In more detail, a base 160 is installed below the rear cabinet 150, so that the rear cabinet 150 is seated in the upper portion of the base 160. A lower intake port 161 is formed at the front of the base 160 to suction indoor air, and a lower intake vane 116 controls the opening and closing of the lower intake port 161.

[0016] Also, an upper discharge port 112 is formed at the upper edge of the front cabinet 110, and an upper discharge vane 111 controls the opening and closing of the upper discharge port 112. A side discharge port 113 is formed at the upper side portion of the front cabinet 110, and a side vane 115 controls the opening and closing of the side discharge port 113. A side intake port 114 is formed at the lower side portion of the front cabinet 110, and a side intake vane 115 controls the opening and closing of the side intake port 114. Specifically, the side intake port 114 and the side discharge port 113 are simultaneously opened and closed by the side vane 115.

[0017] A HEPA filter insertion slot 119 is formed at the front of the front cabinet 110 to insert the HEPA filter 120 therein, and an air filter insertion slot 118 is formed at left and right side edges on the front of the front cabinet 110 to insert the air filter 121 therein. A dust filter insertion slot 117 is formed inward of each air filter 121 for inserting a dust filter 170 therein.

[0018] The panel assembly 200 includes a front panel 210 pivotably coupled to the front of the front cabinet 110, an art panel 230 attached to the front of the front panel 210 to mount a picture or photograph thereon, and a front cover 220 attached at the front of the art panel 230 for protecting the art panel 230.

[0019] In further detail, the front cover 220 may be made of a material that allows the art panel 230 to be seen from the outside. A display 211 is formed on the front of the front cover 220 to display the operating status of the indoor unit 100. Depending on the location of the display 211, the art panel 230 may be formed as a single piece or divided into two or more pieces. In the following embodiment, a display 211 is installed at the relative center of the front panel 210, and the art panel 230 is installed in two parts - above and below the display 211.

[0020] The operation of the standing air conditioner indoor unit 100 will now be described. First, when power is applied to the indoor unit 100 and an "on" button is pressed, a drive motor (not shown) operates to drive the blower fan 140. The blower fan 140 that is connected to the shaft of the drive motor rotates, and refrigerant flows into the heat exchanger 130. Then, the side vane 115, the upper discharge vane 111, and the lower intake vane 116 pivot to open the discharge and intake ports.

[0021] Indoor air is suctioned through the side intake port 114 formed at the side of the front cabinet 110 and through the lower intake port 161 formed on the base 160. The air passes through the HEPA filter 120 and the air filter 121 and is removed of dust and other impurities in a first filtering stage. Then, the indoor air that passes through the air filter 121 passes through the dust filter 170 in a second filtering stage. Next, the purified indoor air that has passed through the HEPA, air, and dust filters rises toward the heat exchanger 130. The indoor air then passes through the heat exchanger 130, whereupon it exchanges heat with refrigerant flowing through the inside of the heat exchanger 130 and becomes cooler in temperature. The air that becomes cooler while passing through the heat exchanger 130 passes through the upper and side discharge ports 112 and 113 to be discharged back into the indoor space. Here, the side vane 115 pivots back and forth at a predetermined angle to distribute the discharged air evenly throughout the indoor space.

[0022] Fig. 3 is a perspective view of a panel assembly according to the first embodiment of the present invention.

[0023] Referring to Fig. 3, the panel assembly 200 according to the present invention includes a front panel 210, a front cover 220 pivotably coupled to the front of the front panel 210, and an art panel 230 mounted to the front of the

front panel 210 to attach a picture or photograph thereto.

[0024] In further detail, the front panel 210 has an art panel mounting portion 212 formed at the front thereof for mounting the art panel 230 in. The front cover 220 is pivotably coupled at one edge thereof to the front panel 210 by means of a hinge 240. Also, at least one magnet 221 is installed on the rear periphery (opposite to the edge where the hinge 240 is installed) of the front cover 220. The portion of the front panel 210 opposite to the magnet 221 may also have a magnet installed thereon for providing mutually attracting magnetic force between the opposing magnets. In the case where the front panel 210 is made of a metal that attracts magnets, there is no need to install a magnet thereon. The magnetic force of the magnet 221 maintains an edge of the front cover 220 at a predetermined gap with the front panel 210 while preventing movement thereof when the front cover 220 is closed.

[0025] The art panel 230 is mounted in two parts above and below the display 211, so that a user is able to open the front cover 220 to freely change the art panel 230. The size of the front cover 220 may be the same as that of the front panel 220, or the front cover 220 may be formed to respectively cover and protect each part of the art panel 230. In other words, the front cover 220 may be installed above and below the display 211 in sizes corresponding to the parts of the art panel 230. In this case, in order to change an art panel 230 installed above the display 211, a user opens only the portion of the front cover 220 formed above the display 211, so that the front cover 220 can be more easily opened using less force.

[0026] Fig. 4 is a perspective view of a panel assembly according to the second embodiment of the present invention.

[0027] Referring to Fig. 4, the panel assembly 200 according to the present invention is characterized by the front cover 220 cohered to the front panel 210 by means of a hook.

[0028] In further detail, the front cover 220 is pivotably coupled to the front panel 210 by means of a hinge 240, as in Fig. 3. At least one hook 222 is installed on the rear periphery of the front cover 220, so that the front cover 220 coheres against the front panel 210 when the front cover 220 is closed. A hook receptacle 213 is formed on the front of the front panel 210 to receive the hook 222 inserted therein. Here, the hook 222 and the hook receptacle 213 may be oppositely formed. That is, the hook 222 may be formed on the front panel 210, and the hook receptacle 213 may be formed on the front cover 220.

[0029] In the above structure, in order to change an art panel 230 mounted in the front panel 210, a user pulls the front cover 220 forward so that the hook 222 is released from the hook receptacle 213. Then, after the art panel 230 is replaced, the front cover 220 is pivoted on the hinge 240 so that the hook 222 inserts back into the hook receptacle 213.

[0030] In this embodiment, the front cover 220 is the same size as the front panel 210, but may alternately be formed in two pieces corresponding to the respective sizes of the two-part art panel 230.

[0031] Fig. 5 is a perspective view of a panel assembly according to the third embodiment of the present invention.

[0032] Referring to Fig. 5, the panel assembly 200 according to the present invention is characterized by the front cover 220 being completely detachable from the front panel 210.

[0033] In more detail, a hook connects the front cover 220 and the front panel 210 instead of the hinge 240.

[0034] A plurality of hooks 222 are formed on the rear periphery of the front cover 220, and a hook receptacle 213 is formed on the front of the front panel 210 for the hook 222 to be inserted into. An art panel 230 is mounted in an art panel mounting portion 212 formed at the front of the front panel 210.

[0035] In the above structure, in order to insert the hook 222 formed on the rear of the front cover 220 into the hook receptacle 213, a user pushes the front cover 220 against the front of the front panel 210. To detach the front cover 220 from the front panel 210, the front cover 220 is pulled forward in the opposite direction.

[0036] In another method of completely detaching the front cover 220 from the front panel 210, a magnet may be installed in place of the hook 222. In other words, the magnet may be installed on the mounting location of the hook 222, so that the magnetic force couples the front cover 220 and the front panel 210. Here, the number of magnets attached may be varied to adjust the magnetic force created, so that a user can easily detach the front cover 220 from the front panel 210, while the front cover 220 does not autonomously detach from the front panel 210 and fall to the floor.

[0037] Fig. 6 is a perspective view of a panel assembly according to the fourth embodiment of the present invention.

[0038] Referring to Fig. 6, the panel assembly 200 according to the present invention is characterized by a cavity formed within the front panel 210 for inserting the art panel 230 into, where the art panel 230 is inserted through the top or a side of the front panel 210.

[0039] In further detail, the front panel 210 is made of a transparent material that allows its inside to be visible, and a cavity having the same three-dimensional size as the art panel 230 is formed within the front panel 210. An insertion slot 214 is formed on a side of the front panel 210 for inserting the art panel 230 through.

[0040] In this structure, the art panel 230 can be freely interchanged, while the manufacturing cost of the panel assembly 200 is reduced.

[0041] Fig. 7 is a perspective view of a standing air conditioner indoor unit with a panel assembly according to the fifth embodiment of the present invention.

[0042] Referring to Fig. 7, the standing indoor unit 100 of the air conditioner according to the present invention includes a front panel 210 installed at the front of a front cabinet 110, and a display device 300, such as a liquid crystal display

(LCD), plasma display panel (PDP), and organic light emitting diode (OLED) installed on the front of the front panel 210.

[0043] Specifically, a digital data transfer portion is formed on a side of the front panel 210 or the display device 300, and a cable 310 (or data transferring member) is connected to the digital data transfer portion for transferring digital data. An image from a digital signal that is transferred through the cable 310 is displayed on the display device 300. Accordingly, a user does not need to physically mount a picture or photograph, but can save a large quantity of pictures, photographs, and other images in digital format to display on the display device 300.

[0044] For example, after saving preferred pictures, photographs or moving images as files on a computer, a user can display them on the display device 300 through the cable 310. By thus providing the display device 300, there is no need to manually change pictures or photographs, and the front of the standing indoor unit 100 may function as a monitor as well.

[0045] Fig. 8 is a perspective view of a panel assembly according to the sixth embodiment of the present invention.

[0046] Referring to Fig. 8, the panel assembly 200 according to the present invention is characterized by an art panel 230 that is mounted on a front panel 210 being mounted on the entirety of the front panel 210.

[0047] In further detail, as opposed to the first through fifth embodiments, the sixth embodiment re-positions the display 211 that was roughly located in the center of the front panel 210 to a peripheral location thereon, or deletes the display 211 and provides only operating controls.

[0048] It is clear that in addition to the structures of the front panel 210 and the art panel 230 in the respective embodiments described above, the structures of the two panels shown in Fig. 8 may be equally applied to a standing indoor unit of an air conditioner.

[0049] The standing air conditioner indoor unit according to the present invention performs not only the functions of a standing air conditioner indoor unit according to the related art, but also allows the display of easily interchangeable images such as art prints and family portraits at the front thereof, to become a piece of furniture complimenting the interior of a room.

[0050] By allowing the interchangeable display of photographs, pictures, etc. at the front thereof, the above structure of the standing air conditioner indoor unit can augment the interior decoration of a room, and thus has a high industrial applicability.

[0051] While the present invention has been described and illustrated herein with reference to the preferred embodiments thereof, it will be apparent to those skilled in the art that various modifications and variations can be made.

Claims

1. An air conditioner for suctioning indoor air to exchange heat with refrigerant circulating inside a heat exchanger and discharging the indoor air in a cold or a hot state back to an indoor space, the air conditioner comprising:

a rear cabinet;
a front cabinet coupled to a front of the rear cabinet, and including an intake port formed at a lower side portion thereof and a discharge port formed at an upper side portion thereof;
a blower fan installed in an inner lower portion of the rear cabinet for suctioning indoor air;
a heat exchanger installed above the blower fan for exchanging heat with the suctioned indoor air; and
a panel assembly installed on a front of the front cabinet for interchangeably mounting an image thereto.

2. The air conditioner according to claim 1, wherein the panel assembly includes:

a front panel installed on a front of the front cabinet; an art panel mounted on a front of the front panel and having an image attached thereto; and
a front cover covering a front of the art panel.

3. The air conditioner according to claim 2, wherein the front panel has a mounting portion formed at a front thereof for mounting the art panel.

4. The air conditioner according to claim 2, wherein the front cover is detachably or pivotably coupled to the front panel.

5. The air conditioner according to claim 2, wherein the front cover is coupled to the front panel through a hinge, to be capable of pivoting at a side of the front panel.

6. The air conditioner according to claim 2, wherein the panel assembly further includes at least one cohering member provided on at least one of a rear of the front cover and the front of the front panel, the cohering member for cohering

the front cover to the front panel.

7. The air conditioner according to claim 6, wherein the cohering member is a magnet or a hook.

5 8. The air conditioner according to claim 2, wherein the front panel has a mounting portion formed at a front thereof for mounting the art panel.

9. The air conditioner according to claim 1, wherein the panel assembly includes:

10 an art panel for attaching a picture or a photograph thereto; and
a front panel installed on the front of the front cabinet, and having an insertion slot provided on a side thereof for inserting the art panel through and a cavity formed therein for receiving the art panel.

15 10. The air conditioner according to claim 2 or claim 9, wherein the front panel is detachably or pivotably coupled to the front cabinet.

11. The air conditioner according to claim 1, wherein the panel assembly is formed with one of an liquid crystal display, hereinafter referred to as LCD, a plasma display panel, hereinafter referred to as PDP and an organic light emitting diode, hereinafter referred to as OLED.

20 12. The air conditioner according to claim 11, wherein the panel assembly includes a data transfer portion formed on a side thereof for transferring digital data, and the panel assembly displays an image derived from the transferred digital data.

25 13. An air conditioner for suctioning indoor air to exchange heat with refrigerant circulating inside a heat exchanger and discharging the indoor air in a cold or a hot state back to an indoor space, the air conditioner comprising:

30 a blower fan for suctioning indoor air;
a heat exchanger installed above the blower fan for exchanging heat between the suctioned indoor air and refrigerant;
a cabinet assembly including the blower fan, the heat exchanger, and a filter assembly disposed therein, and an indoor air intake port and an indoor air discharge port formed at a front thereof; and
a panel assembly including a front panel coupled to a front of the cabinet assembly, a front cover pivotably or detachably coupled to a front of the front panel, and an art panel mounted to the front of the front panel, wherein
35 the filter assembly is installed towards an inside of the indoor air intake for filtering impurities in the indoor air suctioned by the blower fan.

40 14. An air conditioner for suctioning indoor air to exchange heat with refrigerant circulating inside a heat exchanger and discharging the indoor air in a cold or a hot state back to an indoor space, the air conditioner comprising:

a blower fan for suctioning indoor air;
a heat exchanger installed above the blower fan for exchanging heat between the suctioned indoor air and refrigerant;
a cabinet assembly including the blower fan, the heat exchanger, and a filter assembly disposed therein, and
45 an indoor air intake port and an indoor air discharge port formed at a front thereof; and
a front panel coupled to the front of the cabinet assembly and formed with one of an LCD, a PDP, and an OLED, the front panel including a data transfer portion formed on a side thereof for transferring digital data.

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Fig.1

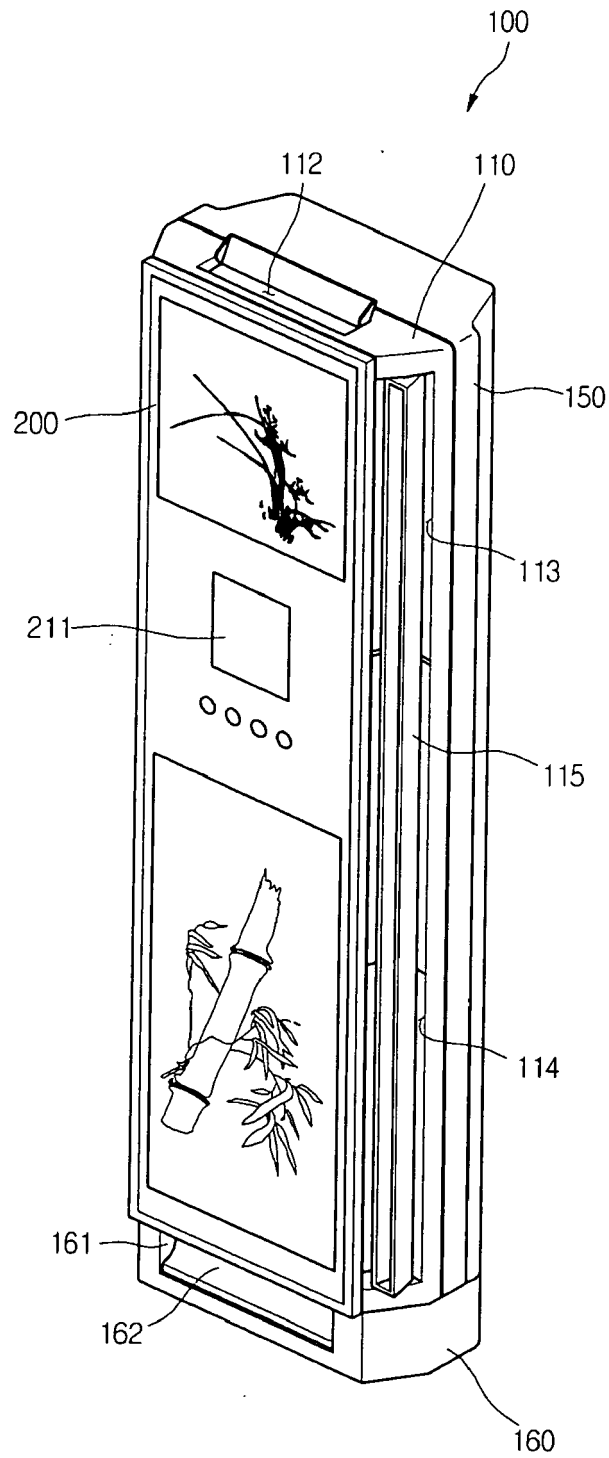


Fig.2

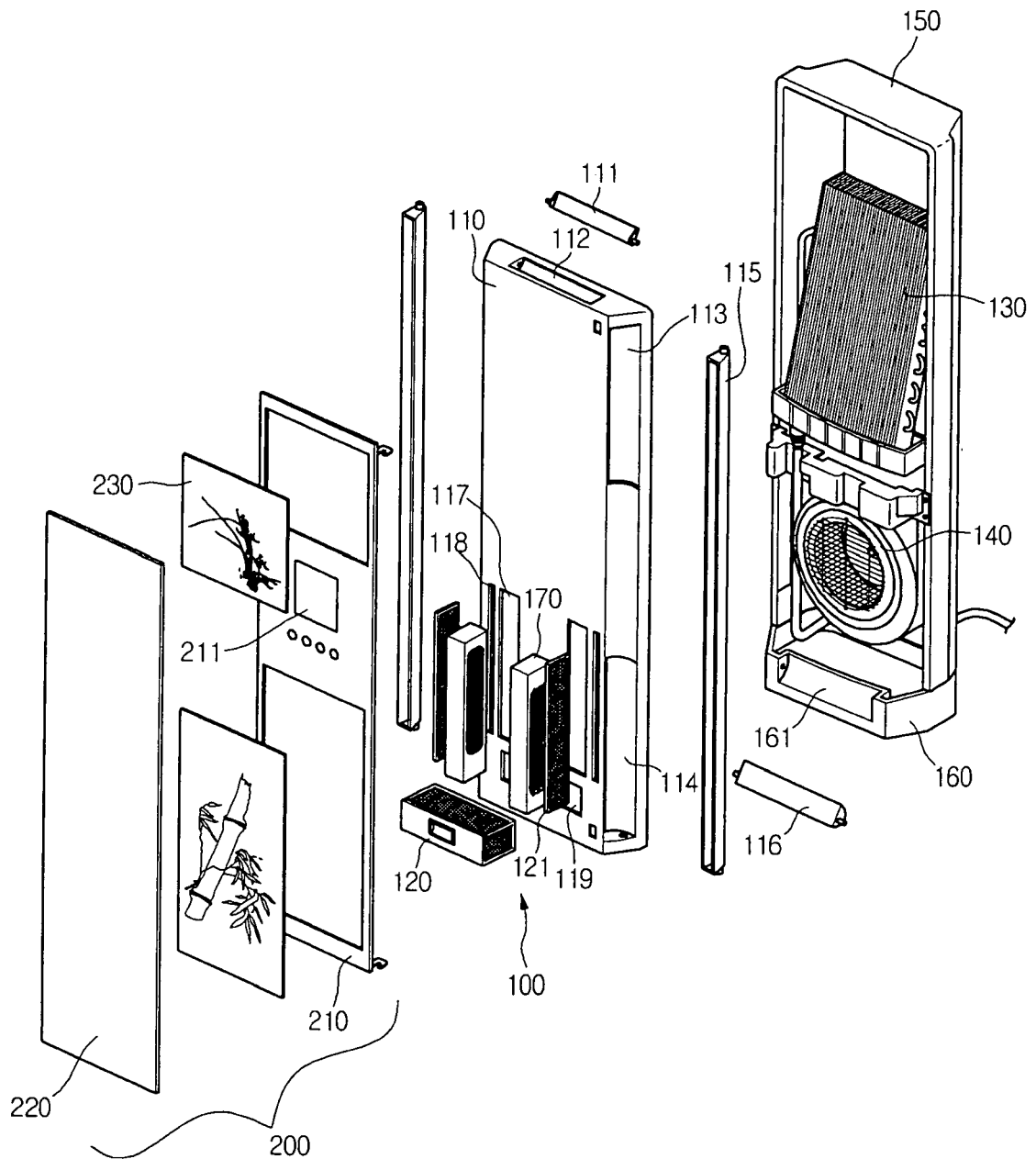


Fig.3

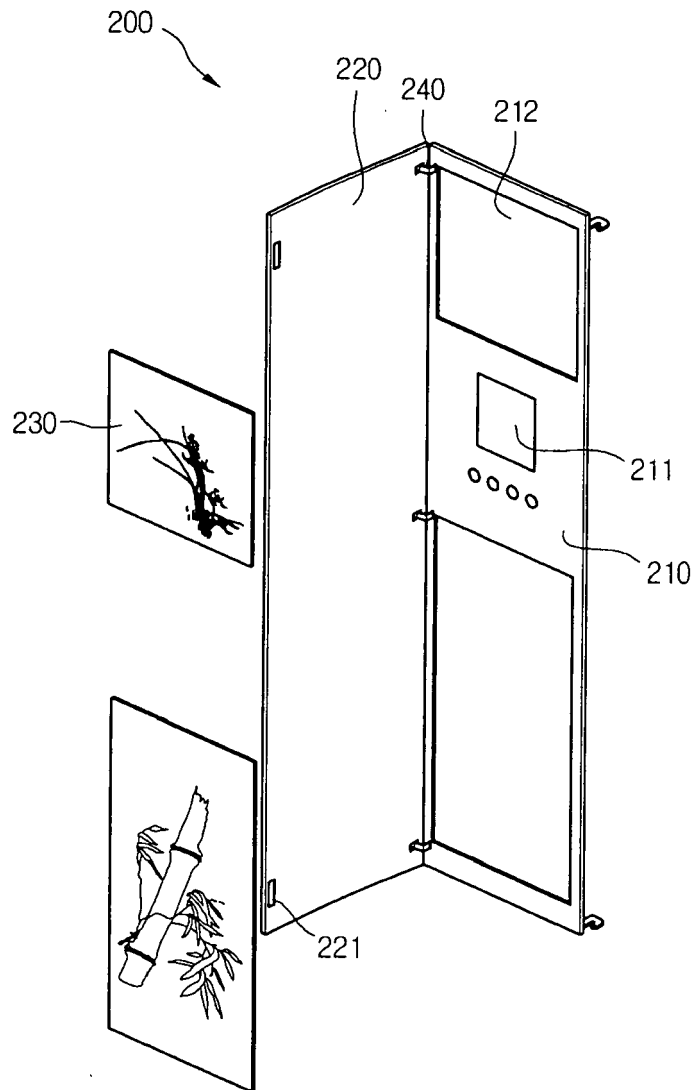


Fig.4

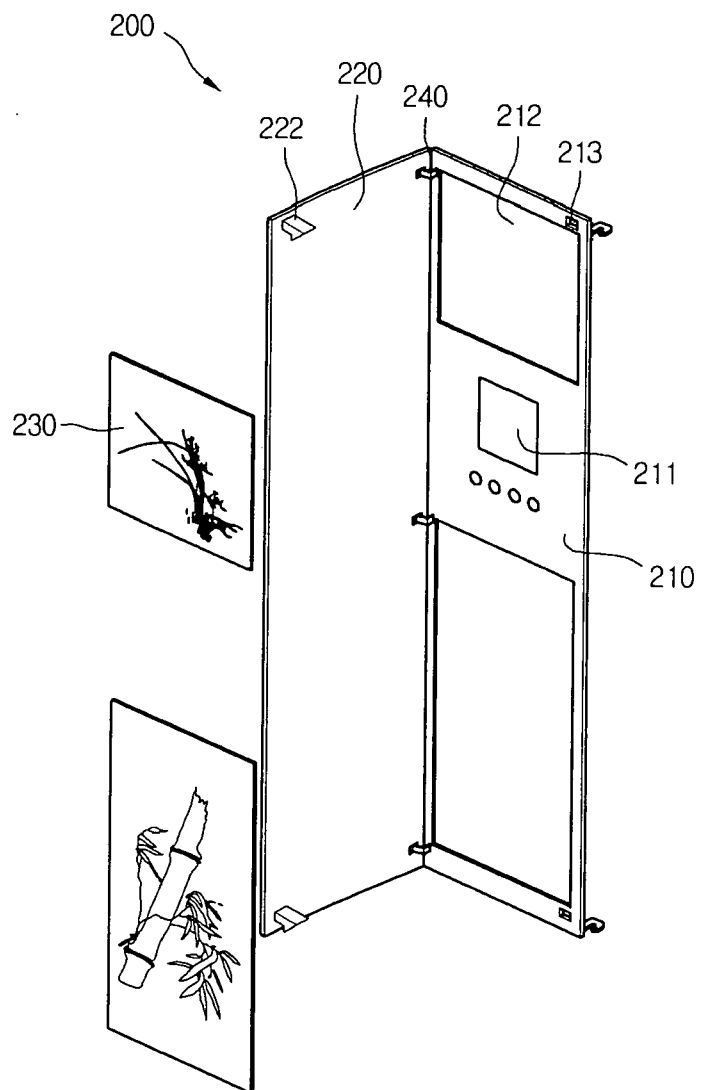


Fig.5

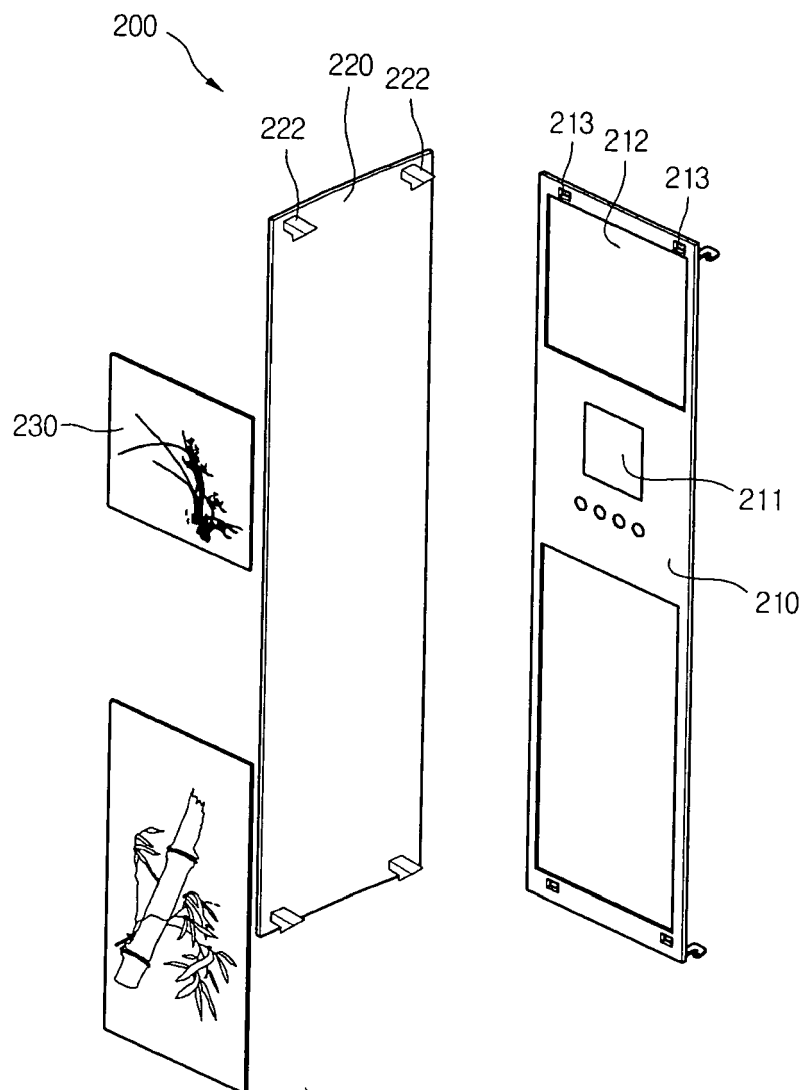


Fig.6

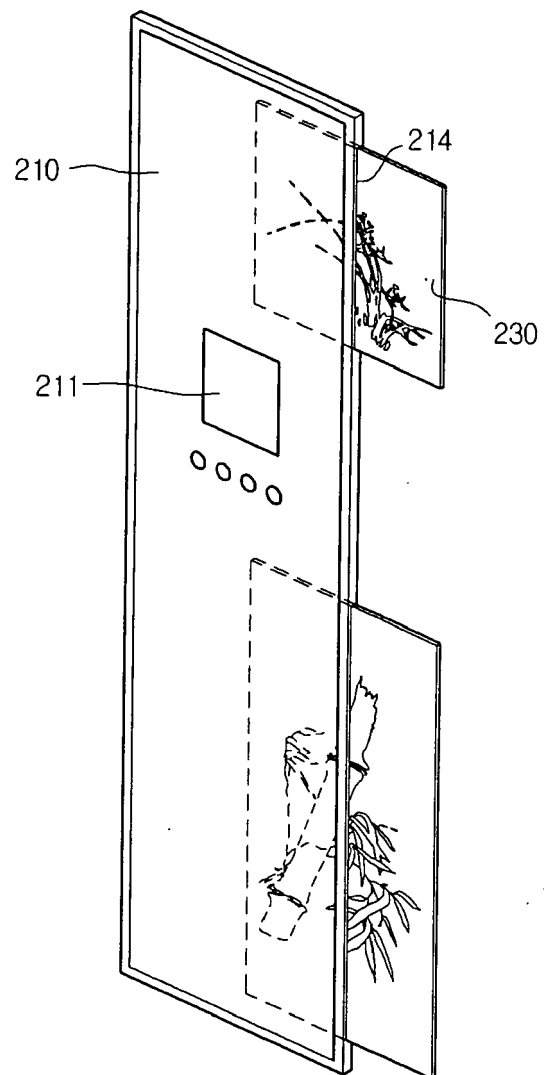


Fig. 7

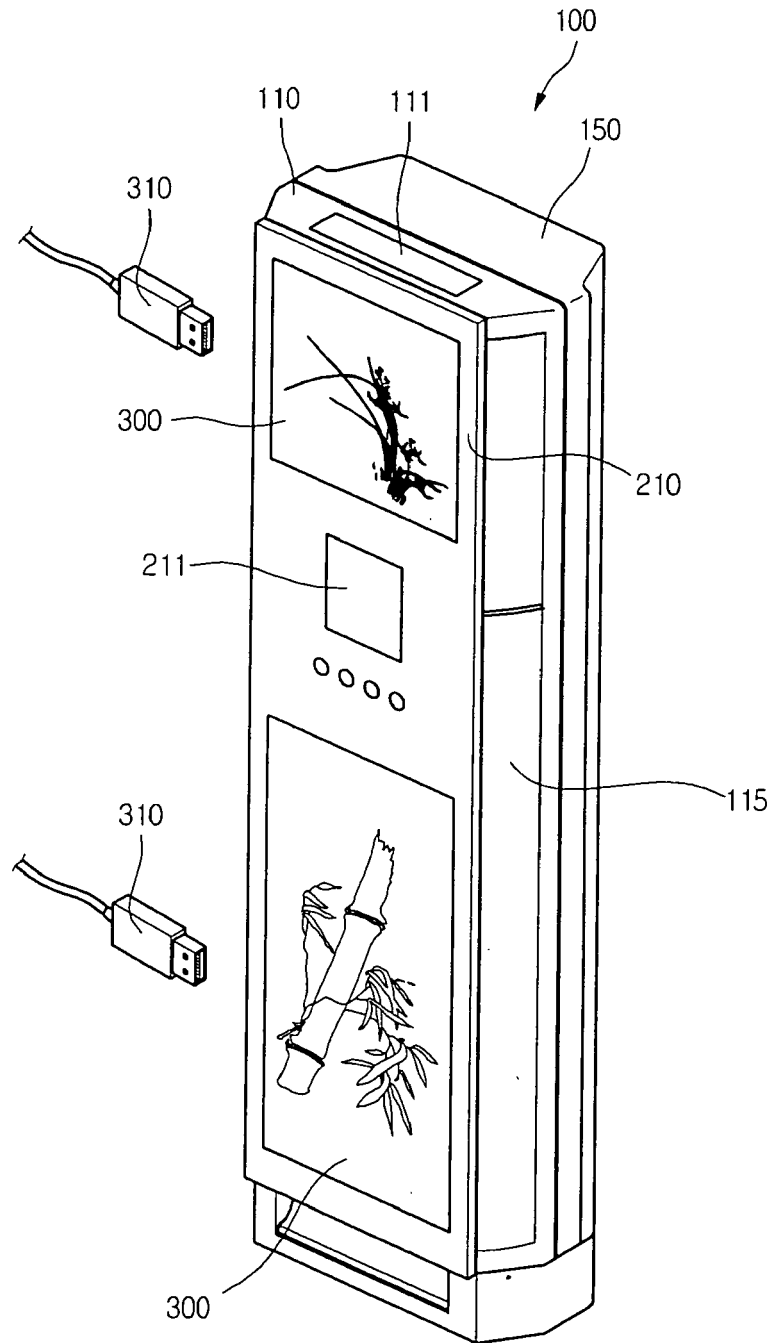


Fig. 8

