



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

(43) Date of publication:
19.07.2017 Bulletin 2017/29

(51) Int Cl.:
F24F 1/00 ^(2011.01) **F24F 13/12** ^(2006.01)

(21) Application number: **16829715.8**

(86) International application number:
PCT/CN2016/086684

(22) Date of filing: **22.06.2016**

(87) International publication number:
WO 2017/016348 (02.02.2017 Gazette 2017/05)

(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:
MA MD

- **LI, Xiongwei**
Qingdao
Shandong 266101 (CN)
- **HAO, Benhua**
Qingdao
Shandong 266101 (CN)
- **XU, Zhonghua**
Qingdao
Shandong 266101 (CN)
- **HOU, Yanhui**
Qingdao
Shandong 266101 (CN)
- **LI, Meihua**
Qingdao
Shandong 266101 (CN)

(30) Priority: **30.07.2015 CN 201510457100**

(71) Applicant: **Qingdao Haier Air Conditioner Gen
Corp., Ltd.**
Qingdao, Shandong 266101 (CN)

(72) Inventors:
• **GENG, Baohan**
Qingdao
Shandong 266101 (CN)

(74) Representative: **Ziebig, Marlene**
Straße 4, Nr. 12A
13125 Berlin (DE)

(54) **VERTICAL AIR CONDITIONER**

(57) Disclosed is a vertical air conditioner, comprising an air conditioner body (100), which air conditioner body (100) comprises an air conditioner main body (1), an air supply duct being formed in the air conditioner main body (1), wherein the air conditioner further comprises a first panel (2) and a second panel (3), and a first panel driving mechanism (5) and a second panel driving mechanism for respectively driving the first panel (2) and the second panel (3) to slide away from each other to form an air outlet (4) between the first panel (2) and the second panel (3) and an air outflow end of the air supply duct when the air conditioner is powered on, and for respectively slide the first panel (2) and the second panel (3) to slide towards each other to close the air outlet (4) when the air conditioner is powered off. In the vertical air conditioner, there is no need to provide an air outlet directly on the panel, and there is also no need to additionally arrange an air guide plate on the air outlet, thereby preventing occurrence of problems such as poor appearance caused by the arrangement of the air guide plate, and ingress of dust due to likely generated gaps.

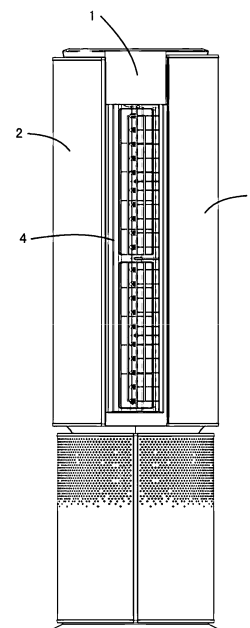


Fig. 2

Description

Technical Field

[0001] The present invention relates to the field of air conditioning technology and, more particularly, to a vertical air conditioner.

Background of the Invention

[0002] The vertical air conditioners are widely used in office space, public places and family living room due to the large amount of air outflow, strong cooling and heating capacities and other characteristics.

[0003] Most of the existing vertical air conditioners adopts the front air outflow manner, in which a panel of the air conditioner is fixed, an air outlet is provided on the panel, and an air guide plate is arranged at the air outlet. When the air conditioner is turned off, the air guide plate closes the air outlet and substantially matches the panel plane to form an integral panel structure. When the air conditioner is turned on, the air guide plate rotates to open the air outlet, heat exchange air after the exchange of heat is blown out from the air outlet, so as to cool or heat the indoor air for temperature adjustment.

[0004] In the existing vertical air conditioner structure, due to relying on the air guide plate to open or close the air outlet, there is a need to generate a separate panel and air guide plate, and to assemble the two parts. Moreover, if the process control in the air guide plate production process is not accurate, the air guide plate is very likely to be inconsistent with the panel when the air guide plate closes the air outlet, affecting the appearance. If a gap remains between the air guide plate and the panel, not only the aesthetics is affected, but also dust or the like in the environment easily enter into the air conditioner through the gap. Especially after the long use of the air guide plate, which is affected by the alternating hot and cold wind from the air outlet, the air guide plate is prone to deformation, and cannot completely close the air outlet, so that the gap between the air guide plate and the panel is increased, further affecting the aesthetics of the appearance of the air conditioner, increasing the probability of dust entering into the air conditioner from the gap, and affecting the service life of the internal structural members of the air conditioner and the air supply performance of the air conditioner.

Summary of the Invention

[0005] An object of the present invention is to provide a vertical air conditioner which solves the above problems existed in the existing air conditioners in which an air outlet is provided on a panel and a separate air guide plate is used to open and close the air outlet.

[0006] In order to realize the above object of the present invention, the present invention uses the technical solution as follows:

[0007] a vertical air conditioner, comprising an air conditioner body which comprises an air conditioner main body in which an air supply duct is formed, wherein the air conditioner further comprises a first panel and a second panel, and a first panel driving mechanism and a second panel driving mechanism for respectively driving the first panel and the second panel to slide away from each other to form an air outlet between the first panel and the second panel and an air outflow end of the air supply duct when the air conditioner is powered on, and for respectively slide the first panel and the second panel to slide towards each other to close the air outlet when the air conditioner is powered off.

[0008] Compared with the prior art, the present invention has the following advantages and positive effects: according to the present invention, the panel drive mechanisms are provided to drive the two panels to slide, and the air outlet is formed by sliding the panels away from each other, and the air outlet is closed by sliding the panels towards each other, so that there is no need to provide an air outlet directly on the panel, and there is also no need to additionally arrange an air guide plate on the air outlet, thereby preventing occurrence of problems such as poor appearance caused by the arrangement of the air guide plate, and ingress of dust due to likely generated gaps.

[0009] Other features and advantages of the present invention will become clearer after reading the embodiments of the present invention, with reference to the appended drawings.

Brief Description of the Drawings

[0010]

Fig. 1 is a front view of one embodiment of a vertical air conditioner of the present invention, with an air outlet being closed;

Fig. 2 is a front view of one embodiment of the vertical air conditioner of the present invention, with the air outlet being opened;

Fig. 3 is a structural schematic view of one embodiment of the vertical air conditioner of the present invention, with part of a panel being removed;

Fig. 4 is a structural schematic view of the back of a panel of one embodiment of the vertical air conditioner of the present invention;

Fig. 5 is an exploded view of a panel assembly structure of one embodiment of the vertical air conditioner of the present invention;

Fig. 6 is a structural exploded view of the vertical air conditioner of the embodiment of Fig. 1;

Fig. 7 is a perspective view of a base in Fig. 6;

Fig. 8 is a structural exploded view of the base of Fig. 7; and

Fig. 9 is a perspective view of a connector in Fig. 6.

Detailed Description of the Invention

[0011] In order to make the purposes, technical solutions and advantages of the present invention clearer and more comprehensible, the present invention is further illustrated in detail below in conjunction with the accompanying drawings and embodiments.

[0012] An embodiment of a vertical air conditioner of the present invention is shown in Figs. 1 to 9. Figs. 1 and 2 are front views of this embodiment, with an air outlet being closed and opened, respectively; Fig. 3 is a structural schematic view, with part of a panel being removed; Fig. 4 is a structural schematic view of the back of a panel; Fig. 5 is an exploded view of a panel assembly structure; Fig. 6 is a structural exploded view of the vertical air conditioner of this embodiment; Figs. 7 and 8 are respectively a perspective view and a structural exploded view of a base; and Fig. 9 is a perspective view of a connector.

[0013] As shown in Figs. 1 and 2, the vertical air conditioner of this embodiment comprises a base 7 and an air conditioner body 100 in the form of a cylinder as a whole, and the base 7 is detachably fitted with the air conditioner body 100. It is not limited to the cylindrical structure, but may be of other structures. For example, the air conditioner body 100 and the base 7 are both of a rectangular cubic structure and the like. In the vertical air conditioner, the base 7 serves as the overall bottom seat of the air conditioner body 100, is placed on the ground, and raises the air conditioner body 100 to a certain height. The air conditioner body 100, as the structure for realizing basic air conditioning functions such as refrigeration, heating and dehumidification, comprises an air conditioner main body 1, and an air supply duct, a heat exchanger, a fan, etc. (not shown) are formed in the air conditioner main body 1. The air conditioner body 100 further comprises a first panel 2 and a second panel 3. The first panel 2 and the second panel 3 are bilaterally symmetrically formed on the outer side of the air conditioner main body 1 as the front panels of the air conditioner body 100. The first panel 2 and the second panel 3 are not fixed to the air conditioner main body 1 but are capable of sliding under the driving of the panel driving mechanisms. Specifically, a slide groove 11 is formed on a border of the air conditioner main body 1 corresponding to the upper and/or lower edges of the first panel 2 and the second panel 3, the upper and/or lower edges of the first panel 2 and the second panel 3 are inserted in the slide groove 11 and slide around the air conditioner main body 1 in the slide groove 11 under the driving of the panel driving mechanisms. Alternatively, a slide rail (not shown) is formed on a border of the air conditioner main body 1 corresponding to the upper and/or lower edges of the first panel 2 and the second panel 3, a slide groove is formed in the upper and/or lower edges of the first panel 2 and the second panel 3 to cover the slide rail of the air conditioner main body 1, and the first panel 2 and the second panel 3 also slide around the air conditioner main body 1 under the driving of the panel driving mechanisms.

The two panels are controlled to slide around the air conditioner main body 1, such that the panel can more tightly fit against the air conditioner main body 1, rather than remote away from the air conditioner main body 1, thereby reducing the space occupied after the air conditioner is powered on and the panels slide away from each other, and facilitating the installation and layout of the air conditioner in the room.

[0014] The panel driving mechanisms comprise a first panel driving mechanism 5 for driving the first panel 2 and a second panel driving mechanism (not shown) for driving the second panel 3. Reference can be made to Figs. 3, 4 and 5 for the detailed structure of the panel driving mechanisms. Moreover, when the air conditioner is powered on, the first panel driving mechanism 5 drives the first panel 2 and the second panel driving mechanism drives the second panel 3, so that the first panel 2 and the second panel 3 slide away from each other. For example, the first panel 2 slides to the left or left rear, and the second panel 3 slides to the right or right rear, so that an air outlet 4 is formed between the first panel 2, the second panel 3 and the air outflow end of the air supply duct. The air after the heat exchange of the heat exchanger is then blown out from the air supply duct and the air outlet 4 into the room. Furthermore, when the air conditioner is powered off, the first panel driving mechanism 5 drives the first panel 2 and the second panel driving mechanism drives the second panel 3, so that the first panel 2 and the second panel 3 slide towards each other. For example, the first panel 2 slides to the right and the second panel 3 slides to the left, until the first panel 2 and the second panel 3 come into contact or overlap, thereby closing the air outlet 4.

[0015] The panel drive mechanisms are provided to drive the two panels to slide, and the air outlet is formed by sliding the panels away from each other, and the air outlet is closed by sliding the panels towards each other, so that there is no need to provide an air outlet directly on the panel, and there is also no need to additionally arrange an air guide plate on the air outlet, thereby preventing occurrence of problems such as poor appearance caused by the arrangement of the air guide plate, and ingress of dust due to likely generated gaps.

[0016] Referring to Figs. 3, 4 and 5, and in combination with the illustration of Figs. 1 and 2, the panel driving mechanism is implemented by matching a gear and a rack. Furthermore, for a panel having a relatively large length, it is preferable to provide a driving mechanism at each of the upper and lower ends of the panel in order to ensure the stability of the sliding, and to drive the panel synchronously. Taking the first panel driving mechanism 5 as an example, the specific structure thereof is as follows:

[0017] the first panel driving mechanism 5 comprises an upper end drive mechanism which is located at the upper end of the first panel 1 and formed by a first rack 51, a first motor 52 and a first gear 53, and a lower end drive mechanism which is located at the lower end of the

first panel 1 and formed by a second rack 56, a second motor 57 and a second gear 58. The first rack 51 is fixed to the upper end of the first panel 1 close to the slide groove 11 at the upper end of the air conditioner main body 1, the first motor 52 is fixed to the air conditioner main body 1 in a position corresponding to the first rack 51, the first gear 53 is rotatably connected to the first motor 52 and meshes with the first rack 51 after the first panel 2 is assembled in place. Furthermore, the first motor 52 is accommodated in a first motor box 54; and the first motor box 54 is accommodated in a first gear box 55 together with the first gear 53. Therefore, the motor box and the gear box are used to hidden and protect the corresponding structural members. The structure of the lower end driving mechanism is similar to that of the upper end driving mechanism. Specifically, the second rack 56 is fixed to the lower end of the first panel 1, the second motor 57 is fixed to the air conditioner main body 1 in a position corresponding to the second rack 56, the second gear 58 is rotatably connected to the second motor 57 and meshes with the second rack 52 after the first panel 2 is assembled in place. Likewise, the second motor 57 and the second gear 58 are also hidden and protected by the motor box, the gear box or the like.

[0018] When the driving mechanism drives the panel to slide, the panel can slide in place in a variety of ways, for example, by controlling the motor via a program or by a mechanical mechanism. In this embodiment, the sliding of the panel is limited in a mechanical manner by using a position-limiting structure in combination with the structure of the driving mechanism. Specifically, still taking the first panel driving mechanism 5 as an example, a first position-limiting part 511, in particular a position-limiting block, is formed on the first rack 51; and a second position-limiting part 59 such as a limit switch is formed on the air conditioner main body 1, which matches with the first position-limiting part 511. The second position-limiting part 59 as used herein, which is formed on the air conditioner main body 1, may either be fixed directly to the air conditioner main body 1, or may be formed on another part such as the first gear box 55 which is fixed to the air conditioner main body 1, so that the second position-limiting part is essentially fixed to the air conditioner main body 1 and capable of cooperating with the first position-limiting part 511 for limiting the sliding. When the first position-limiting part 511 comes into contact with the second position-limiting part 59, the air conditioner control system receives the corresponding position-limiting signal and controls the motor of the driving mechanism to stop rotating, and the panel remains in the position and no longer slides, so that the limiting of the sliding is achieved. Furthermore, a position-limiting part may be also formed on the second rack 56 at the same time, and a position-limiting part is formed on the air conditioner main body 1 and cooperates with the position-limiting part on the second rack 56, such that both the upper and lower parts of the panel can perform position limiting. Of course, it is also possible to form a matching position-

limiting structure only on the lower driving mechanism.

[0019] For the panel having a relatively large length, in addition to the use of driving mechanism at two ends to maintain the sliding stability of the panel, it is also possible to provide an additional slide rail to further strengthen the stable and smooth sliding performance. In this embodiment, still taking the first panel 2 as an example, a first slide rail bracket 21 is provided in the middle of the back surface of the first panel 2, and a first slide rail 12 is provided on the air conditioner main body 1 in a position corresponding to the first slide rail bracket 21. After the first panel 2 is fitted to the air conditioner main body 1, the first slide rail 12 is overlapped with the first slide rail bracket 21, when the first panel 2 slides, the first slide rail 12 and the first slide rail bracket 21 performs position limiting and guiding, such that the first slide rail bracket 21 slides along the first slide rail 12 so that the entire panel 1 can slide more smoothly and stably. Alternatively, the slide rail may also be provided on the back surface of the first panel 2, and the corresponding slide rail bracket may be provided on the air conditioner main body 1, so that the purpose of enhancing the stable and smooth sliding performance of the first panel 2 can also be achieved.

[0020] The second panel driving mechanism and other auxiliary structures may refer to the structures corresponding to the first panel described above, and are not specifically described herein.

[0021] In conjunction with the illustration of Figs. 6 to 9, in this embodiment, The air conditioner base 7 comprises a base body 71, which has a fitting part 7121 on the base body 71, and the fitting part 7121 is used to enable the base 7 to be detachably fitted with the air conditioner body 100. Thus, the base 7 becomes a structure substantially independent from the air conditioner body 100. A body air inlet 7141 and a body air outlet 7151 are formed on the base body 71, a cavity is formed in the base body 71, and a fan 722 and an air handling module 73 are formed in the cavity. The air handling module 73 herein refers to a module for realizing a basic handling function other than the heating, refrigeration, dehumidification, etc. of air in the conventional air conditioners, that is, a module for realizing an additional function such as humidification, purification, or refreshing of air.

[0022] Since the body air inlet 7141 and the body air outlet 7151 are formed on the base body 71, and the fan 722 and the air handling module 73 are formed in the base body 71, the base 7 itself forms a separate air supply system. By means of the rational design of the structure, when the fan 722 works, the external air is sucked into base body 71 through the body air inlet 7141, passes through the air handling module 73 and is handled thereby, and then is blown out from the body air outlet 7151, such that the handling of air is achieved by using the air handling module 73. For example, if the air handling module 73 is a humidification module, the air will be humidified in the environment; if air handling module 73 is a purification module, the air will be cleaned in the environment;

and if the air handling module 73 is an aromatherapy deodorization module, the air will be subjected to aromatherapy deodorization in the environment, and so on. In addition, since the base 7 is substantially independent from the air conditioner body 100, it can be individually controlled to realize the independent operation of the additional air handling function and the original basic function of the air conditioner. Since the base 7 does not rely on the original space and air duct structure of the air conditioner body 100, the original air conditioning performance of the air conditioner will not be affected, and there is no need to specially design the structure of the air duct of the air conditioner, thereby simplifying the structure and design for realizing multiple air conditioning functions.

[0023] Specifically, the base body 71 comprises a bottom seat 711, a base main body 712, a base support 713, a rear shell 714, and a front shell 715. The bottom seat 711 is detachably connected to the base main body 712 as a chassis structure for the entire base 7. For example, the detachable connection is made by screws, fasteners, and the like. The fitting part 7121 of the entire base 7 is formed on the base main body 712 at the top end opposite to the bottom seat 711, so that the fitting part 7121 is located at the top of the entire base 7. The base main body 712 is internally formed with a cavity for accommodating the fan 722, the air handling module 73, and other structures to be fitted. In this way, it is bound to make the supporting strength of the base main body 712 become worse. In order to increase the supporting strength and supporting stability of the entire base 7, a base support 713 is formed between the bottom seat 711 and the base main body 712, and specifically between the bottom seat 711 and the fitting part 7121. An outer periphery of the base main body 712 is formed with a shell surrounding the base main body 712. Specifically, the housing surrounding the base main body 712 comprises a rear shell 714 and a front shell 715, and the front shell 715 is divided into left and right portions. The rear shell 714 and the front shell 715 are respectively fixedly connected to the bottom seat 711, the base main body 712 and the base support 713 via fasteners, screws or the like. The body air inlet 7141 is formed on the rear shell 714 for introducing external air; and the body air outlet 7151 is formed on the front shell 715 for delivering the air handled by the air handling module 73.

[0024] An air outflow assembly 72 is formed in the cavity formed by the base main body 712, which air outflow assembly 72 comprises an air outflow frame 721, and the fan 722 is formed in the air outflow frame 721. Specifically, the air outflow assembly 72 and the base main body 712 are fixed via a fastener, a screw or the like; and the fan 722 is a centrifugal fan and is fixed in the air outflow frame 721. Opening are provided at two ends of the air outflow frame 721, with one end facing the bottom seat 711 and the other end facing the fitting part 7121. The air outflow frame 721 forms an air outflow frame air inlet 7211 at the end of the bottom seat 711 and is in

communication with the body air inlet 7141 on the base body 71; and the air outflow frame 721 forms a second air outflow frame air outlet 7213 at the end facing the fitting part 7121. A first air outflow frame air outlet 7212 is formed on the air outflow frame 721 between the air outflow frame air inlet 7211 and the second air outflow frame air outlet 7213. The first air outflow frame air outlet body air 7212 is in communication with the body air outlet 7131 on the base body 71. Preferably, the first air outflow frame air outlet body air 7212 is formed on a side surface of the air outflow frame 721 with a structure in which an air outflow angle is greater than 180°, thereby increasing the air outflow range. In this embodiment, the first air outflow frame air outlet body air 7212 comprises three outlet ports distributed on the side surface of the air outflow frame 721 at intervals, and an air supply angle of about 270° can be formed. The air handling module 73 is also formed on the air outflow frame 721, in particular, the air handling module 73 is formed between the air outflow frame air inlet 7211 and the first air outflow frame air outlet 7212. Preferably, the air handling module 73 is formed on the air outflow frame 721 with a pullable structure to facilitate the after-sales service and the replacement of the air handling module of the same type by the user, and the air handling modules having different air handling functions can be mounted as required, so as to facilitate use of the air handling modules to meet the personalized needs of users.

[0025] In the cavity formed by the base body 712, an electrical cabinet 74 is formed below the air outflow assembly 72. A control panel of the base 7 can be placed in the electrical cabinet 74, and a control panel of the air conditioner body 100 fitted with the base 7 can also be placed. Preferably, the control panels of the base 7 and the air conditioner body 100 are both placed in the electrical cabinet 74. Moreover, the electrical cabinet 74 is remote from the body air inlet 7141 on the base body 71 and may form an air inlet chamber 75 between the electrical cabinet 74, the body air inlet 7141 and the air handling module 73 to ensure that the smooth air inlet and outlet of the base 7.

[0026] On the fitting part 7121, a fitting part air outlet (not marked in the figures), a wire opening 71211 and a connecting pipe opening 71212 are formed. The fitting part air outlet is in communication with the second air outflow frame air outlet 7213 on the air outflow assembly 72. Moreover, after the air conditioner body 100 is fitted with the base 7 via the fitting part 7121, a joint part air outlet 91 is formed between the air conditioner body 100 and the fitting part 7121, and the joint part air outlet 91 is in communication with the fitting part air outlet. Consequently, the air handled by the air handling module 73, in addition to being blown out from the first air outflow frame air outlet 7212 and the body air outlet 7151, is blown out from the second air outflow frame air outlet 7213, the fitting part air outlet and the joint part air outlet 91, that is, from the top of the base 7 and the bottom of the air conditioner body 100, to achieve multi-angle, mul-

ti-height all-round air supply, so that the air outflow range and ways of the vertical air conditioner are increased. The wire opening 71211 provides a channel for the wires electrically connected to the electrical cabinet 74, which allows the wires connecting live parts of the air conditioner body 100 and the electrical cabinet 74 to extend out of the base body 71 through the wire opening 71211 and into the air conditioner body 100. The connecting pipe opening 71212 provides a channel for a connecting pipe which connects the air conditioner body 100 and an outdoor unit of the air conditioner.

[0027] The vertical air conditioner formed by assembling the base 7 using the aforementioned structure with the air conditioner body 100 has a reasonable structure, a wider air outflow range and more air outflow ways, can achieve modular production and fitting, and facilitates personalized selection.

[0028] Moreover, an air outflow grille 92 is formed on the joint part air outlet 91, to sort out the air outflow directions. Moreover, an air outflow cover plate 93 is provided on the joint part air outlet 91 on the outer side of the air outflow grille 92, for opening/closing the joint part air outlet 91, so as to control whether air flows out from the joint part air outlet 91. For example, the air outflow cover plate 93 is formed at the joint part air outlet 91 with a structure in which the air outflow cover plate is connected to the base 7 or/and the air conditioner body 100 in a fastened manner, and the user can manually disassemble the air outflow cover plate 93. If it is desirable that the air flows out from the joint part air outlet 91, the air outflow cover plate 93 is detached to open the joint part air outlet 91, and after the fan 722 of the base 7 is powered on and operates, the air handled by the air handling module 73 is blown out from the joint part air outlet 91. If the air outflow cover plate 93 is fitted to the joint part air outlet 91, the air outflow of the air outlet is closed, and even if the fan 722 is powered on and operates, no air is blown out from the joint part air outlet 91, so that the air outflow range and ways are highly controllable. As a preferred embodiment, the air outflow grille 92 and the air outflow cover plate 93 are both ring-shaped, so that the annular air outflow can be realized, the air outflow angle is large and the air supply range is wide.

[0029] In order to facilitate fitting the base 7 with the air conditioner body 100 and to increase the fitting strength of them, the air conditioner body 100 will be detachably fitted with the base 7 via a connector 8. Specifically, the connector 8 is a round or square disk having a similar structure to the base 7 and the air conditioner body 100, and during fitting, the connector 8 is first fixed to the fitting part 7121 of the base 7 via a connector fixing plate 83, and then the air conditioner body 100 is fixed to the connector 8. The joint part air outlet 91 will be formed between the fitting part 7121 and the connector 8 when the air conditioner body 100 is fixed to the base 7 via the connector 8. Furthermore, a wire opening 81 corresponding to the wire opening 71211 on the fitting part 7121 and a connecting pipe opening 82 correspond-

ing to the connecting pipe opening 71212 on the fitting part 7121 are provided on the bottom surface of the connector 8. In addition, a sealing structure is provided at the wire opening 81 and the connecting pipe opening 82 to prevent the air at the joint part air outlet 91 from leaking from the connector 8.

[0030] The above embodiment is merely used to illustrate the technical solution of the present invention, rather than limiting thereto; although the present invention is explained in detail with reference to the aforementioned embodiment, a person skilled in the art still could modify the technical solution disclosed in the aforementioned embodiment or perform equivalent replacements for some of the technical features therein; and such modifications or replacements do not make the essence of the corresponding technical solutions depart from the spirit and scope of the claimed technical solution of the present invention.

Claims

1. A vertical air conditioner, comprising an air conditioner body which comprises an air conditioner main body in which an air supply duct is formed, **characterized in that** the air conditioner body further comprises a first panel and a second panel, and a first panel driving mechanism and a second panel driving mechanism for respectively driving the first panel and the second panel to slide away from each other to form an air outlet between the first panel and the second panel and an air outflow end of the air supply duct when the air conditioner is powered on, and for respectively slide the first panel and the second panel to slide towards each other to close the air outlet when the air conditioner is powered off.
2. The vertical air conditioner according to claim 1, **characterized in that** a slide groove/rail is formed on a border of the air conditioner main body, and the first panel and the second panel slide around the air conditioner main body in the slide groove/rail.
3. The vertical air conditioner according to claim 1, **characterized in that** the first panel driving mechanism comprises:
 - a first rack formed at one end of the first panel close to the slide groove/rail;
 - a first motor formed on the air conditioner main body; and
 - a first gear rotatably connected to the first motor and meshing with the first rack;
 the second panel driving mechanism comprises:
 - a third rack formed at one end of the second panel close to the slide groove/rail;
 - a third motor formed on the air conditioner

- main body; and
a third gear rotatably connected to the third motor and meshing with the third rack.
4. The vertical air conditioner according to claim 3, **characterized in that** the first panel driving mechanism further comprises:
- a second rack formed at the other end of the first panel opposite to the one end of the first panel where the first rack is located;
a second motor formed on the air conditioner main body; and
a second gear rotatably connected to the second motor and meshing with the second rack;
the second panel driving mechanism further comprises:
- a fourth rack formed at the other end of the second panel opposite to the one end of the second panel where the third rack is located;
a fourth motor formed on the air conditioner main body; and
a fourth gear rotatably connected to the fourth motor and meshing with the fourth rack.
5. The vertical air conditioner according to claim 4, **characterized in that** the first panel driving mechanism further comprises:
- a first position-limiting part formed on the first rack and/or the second rack; and
a second position-limiting part formed on the air conditioner main body and cooperating with the first position-limiting part for position limiting;
the second panel driving mechanism further comprises:
- a third position-limiting part formed on the third rack and/or the fourth rack; and
a fourth position-limiting part formed on the air conditioner main body and cooperating with the third position-limiting part for position limiting.
6. The vertical air conditioner according to claim 1, **characterized in that** a first slide rail/first slide rail bracket is formed on the first panel, and a second slide rail bracket/second slide rail matching the first slide rail/first slide rail bracket is formed on the air conditioner main body; and a third slide rail/third slide rail bracket is formed on the second panel, and a fourth slide rail bracket/fourth slide rail matching the third slide rail/third slide rail bracket is formed on the air conditioner main body.
7. The vertical air conditioner according to claim 6, **characterized in that** the first slide rail/first slide rail bracket is formed in the middle of the first panel, and the third slide rail/third slide rail bracket is formed in the middle of the second panel.
8. The vertical air conditioner according to any one of claims 1 to 7, **characterized in that** the vertical air conditioner further comprises a base detachably fitted with the air conditioner body, wherein the base comprises a base body which has a fitting part, a body air inlet and a body air outlet are formed on the base body, a cavity is formed in the base body, and a fan and an air handling module are formed in the cavity.
9. The vertical air conditioner according to claim 8, **characterized in that** an air outflow assembly is formed in the cavity, and the air outflow assembly comprises an air outflow frame in which the fan is formed; and the air outflow frame is formed with an air outflow frame air inlet and a first air outflow frame air outlet, the first air outflow frame air outlet being located between the air outflow frame air inlet and the fitting part, the air outflow frame air inlet is in communication with the body air inlet, and the first air outflow frame air outlet is in communication with the body air outlet.
10. The vertical air conditioner according to claim 9, **characterized in that** the first air outflow frame air outlet is formed on a side surface of the air outflow frame with a structure in which an air outflow angle is greater than 180°.
11. The vertical air conditioner according to claim 9, **characterized in that** a fitting part air outlet is formed on the fitting part, the air outflow frame is formed with a second air outflow frame air outlet which is located between the first air outflow frame air outlet and the fitting part air outlet, the second air outflow frame air outlet being in communication with the fitting part air outlet, and a joint part air outlet is formed between the air conditioner body and the fitting part, the joint part air outlet being in communication with the fitting part air outlet.
12. The vertical air conditioner according to claim 8, **characterized in that** an electrical cabinet is further formed in the cavity, a wire opening and a connecting pipe opening are formed on the fitting part, the wire connected to the electrical cabinet extends out of the base body through the wire opening, and a connecting pipe of the air conditioner body extends into the base through the connecting pipe opening.

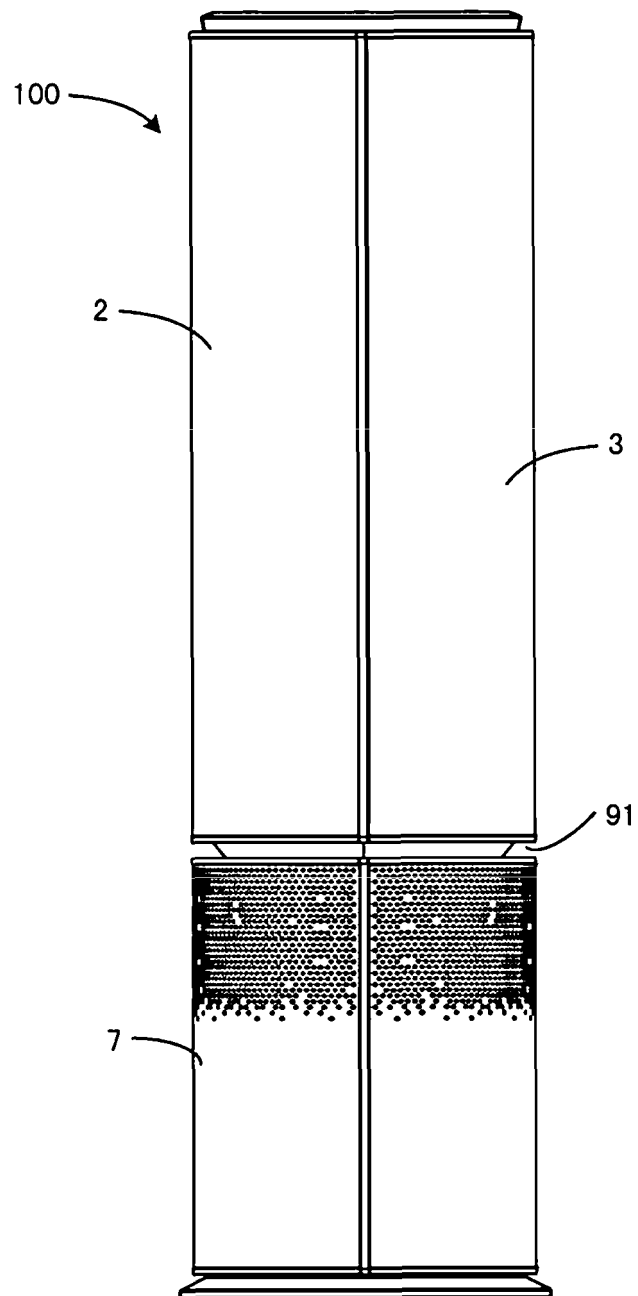


Fig. 1

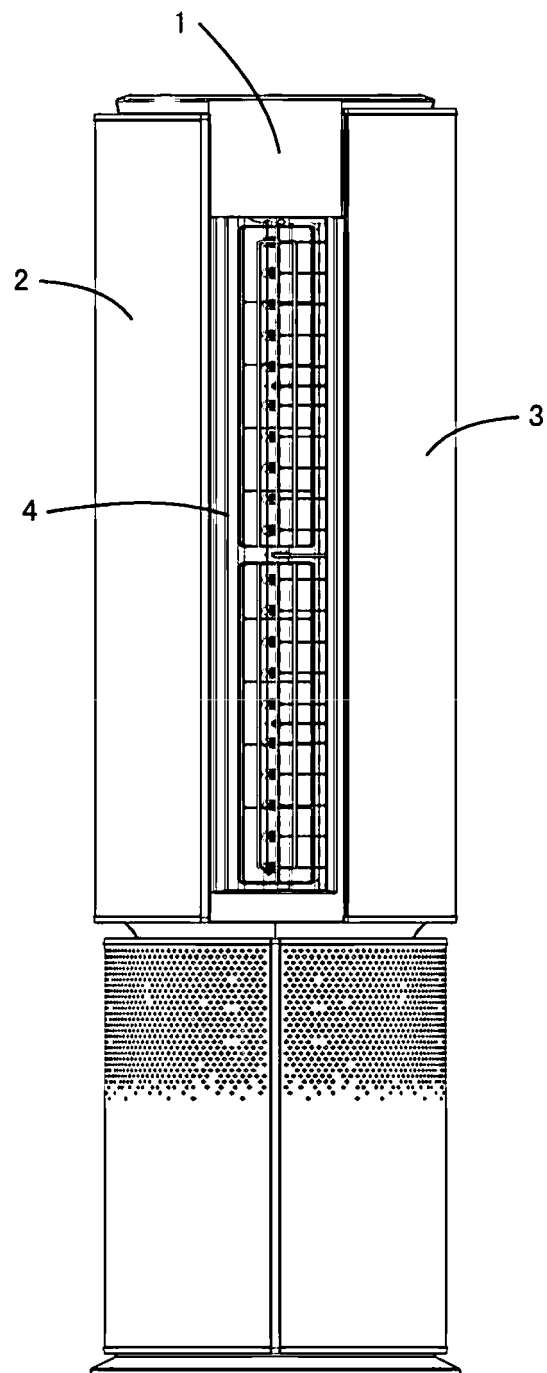


Fig. 2

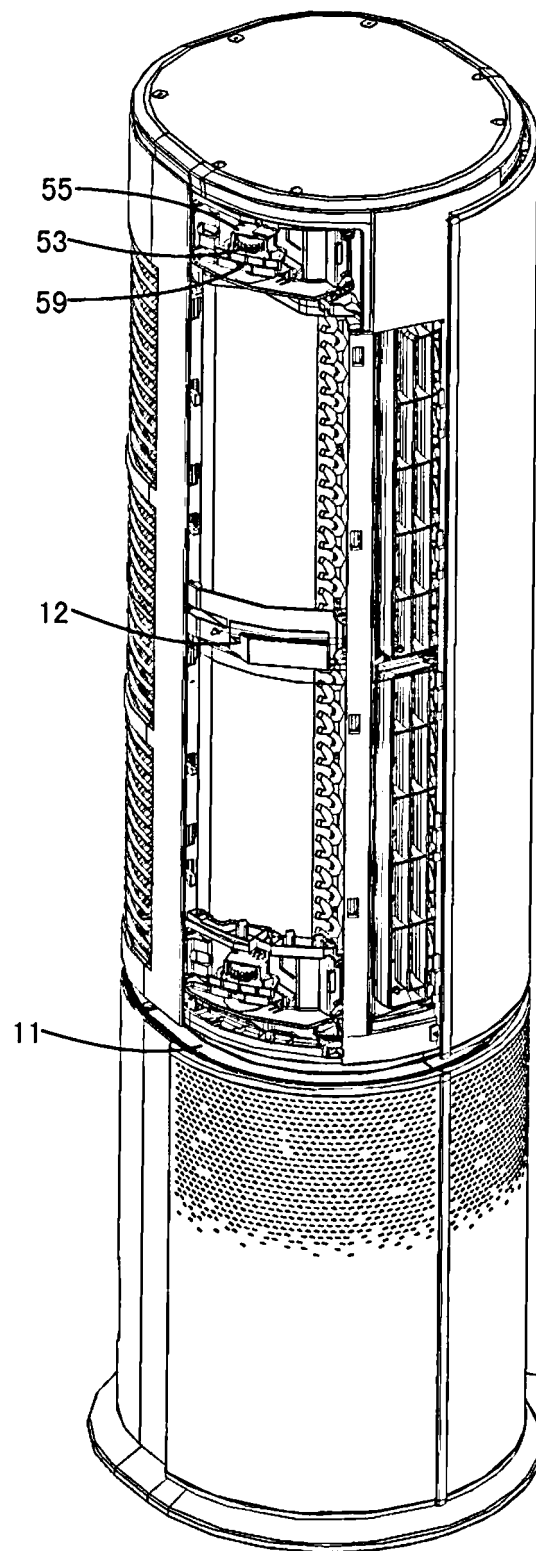


Fig. 3

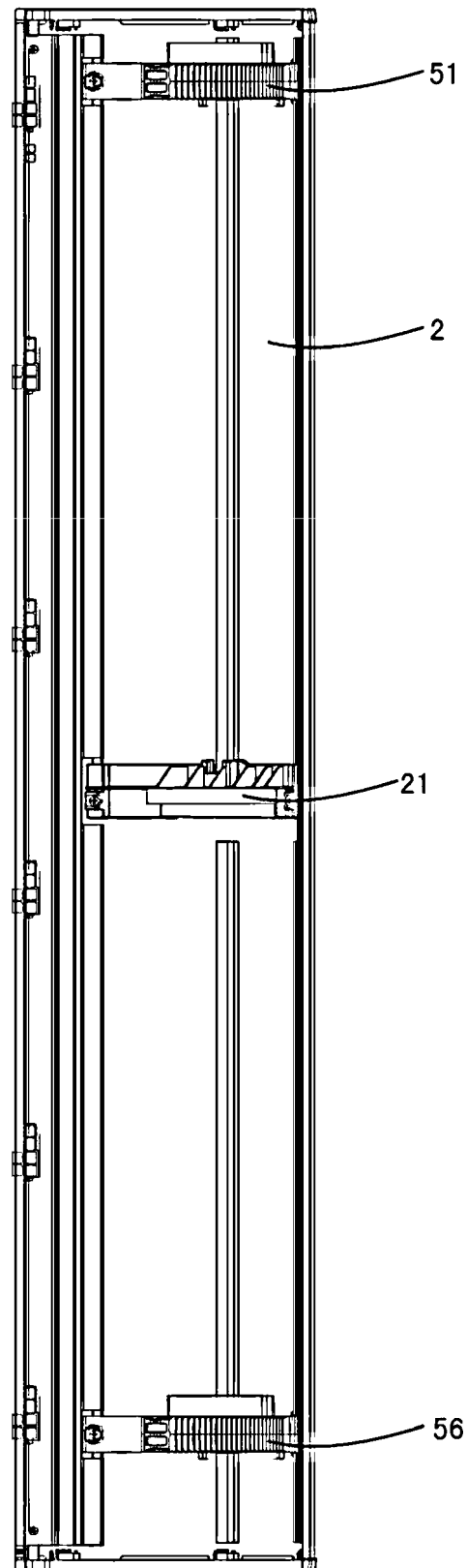


Fig. 4

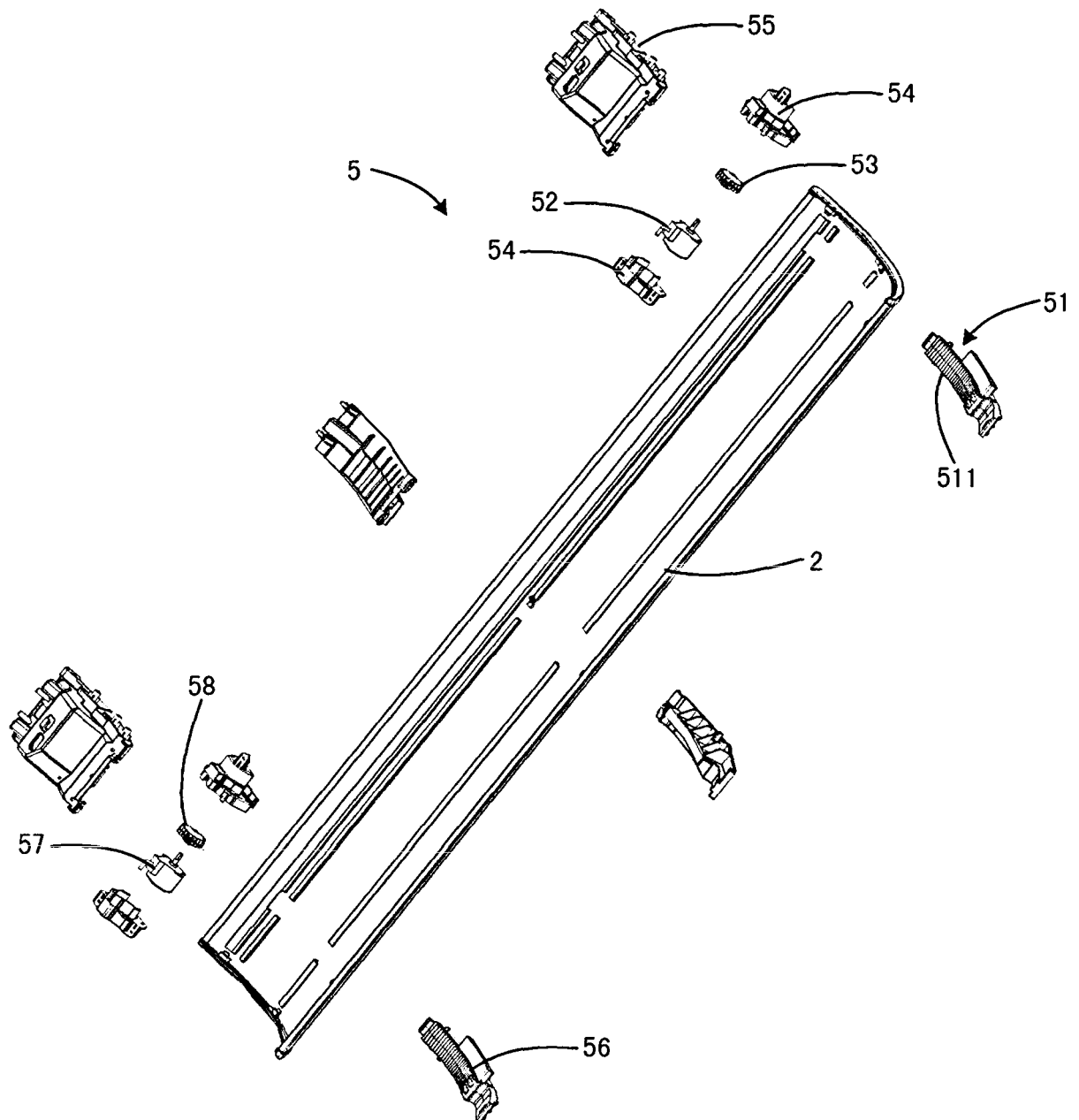


Fig. 5

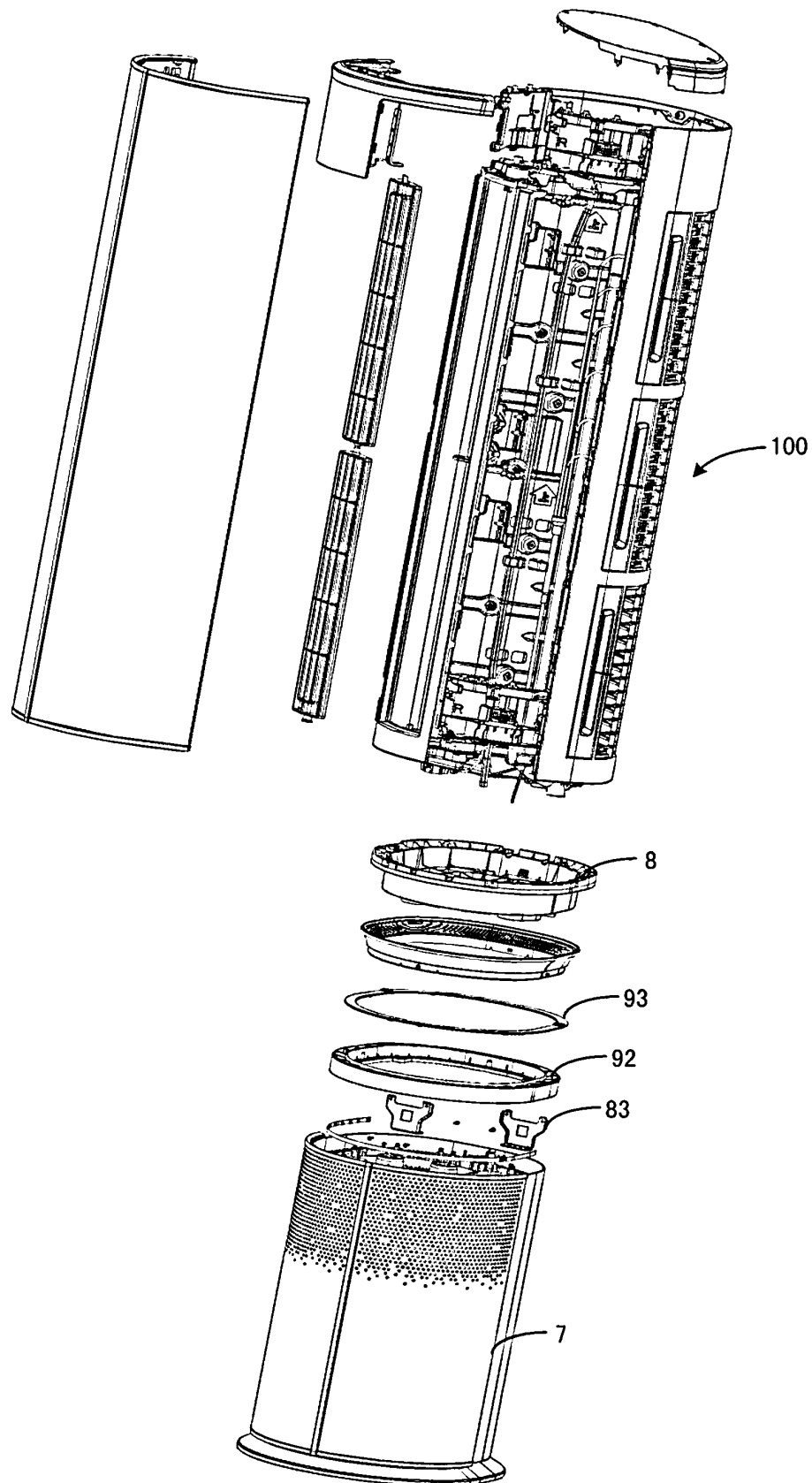


Fig. 6

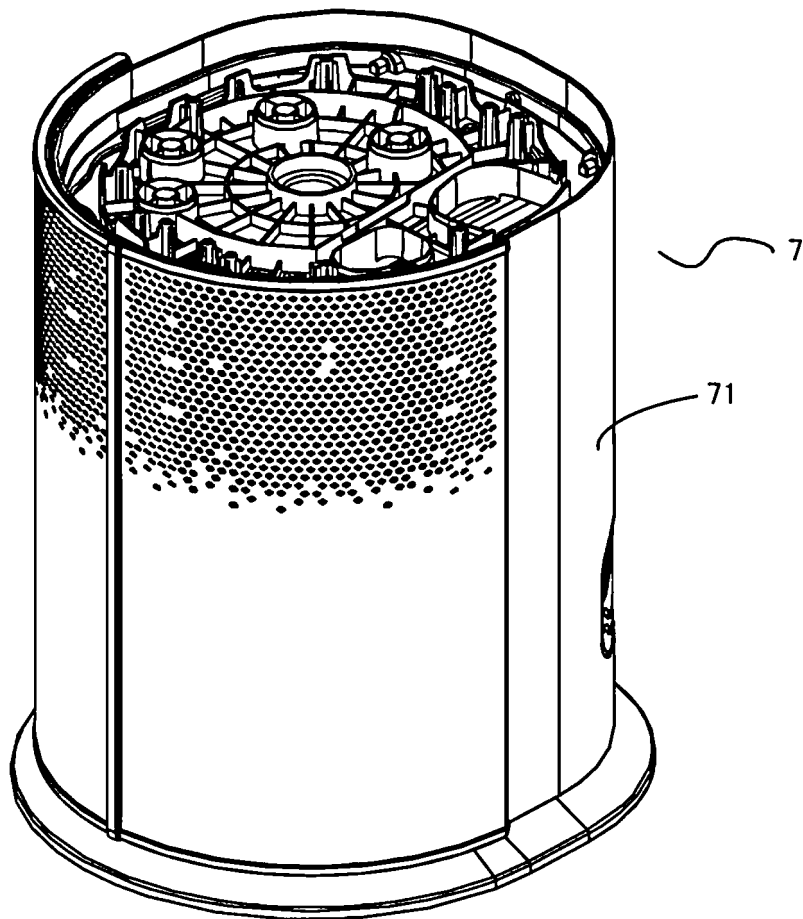


Fig. 7

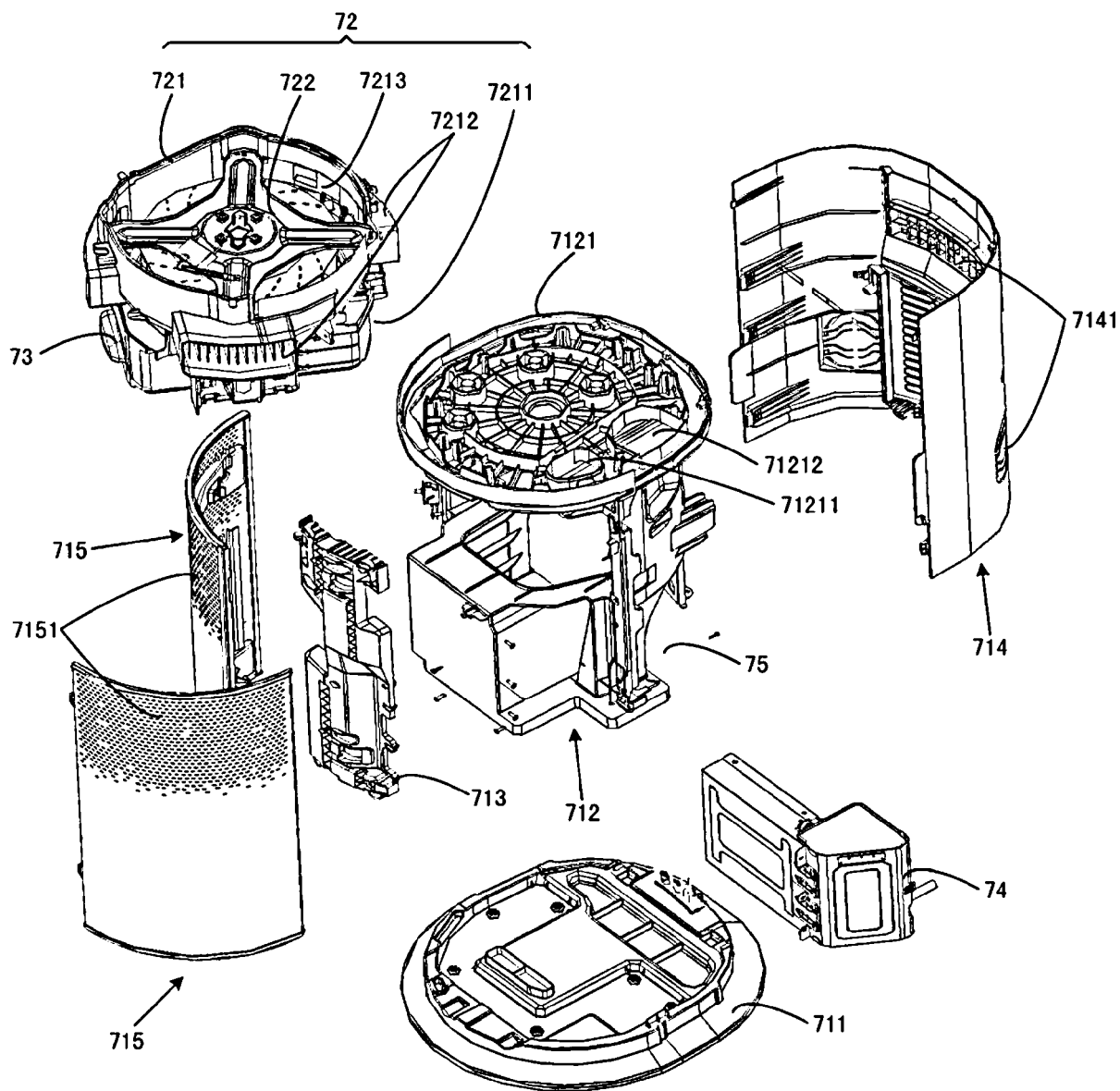


Fig. 8

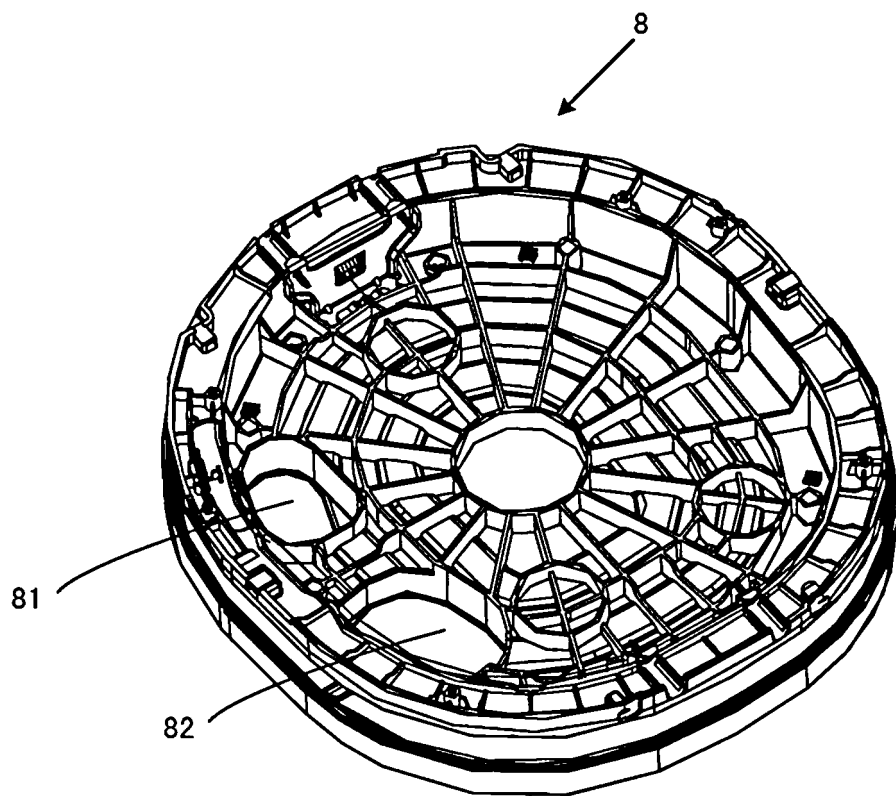


Fig. 9

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2016/086684

A. CLASSIFICATION OF SUBJECT MATTER

F24F 1/00 (2011.01) i; F24F 13/12 (2006.01) i

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

F24F

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

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

SIPOABS, CPRS, CNKI, CNABS, DWPI, EPODOC: left and right, open, first, air vent, close, floor type, vertical type, open, first panel, second panel, panel, left, floor, right, slip+, glid+, second

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 104566909 A (NINGBO AUX AIR-CONDITION CO., LTD.), 29 April 2015 (29.04.2015), description, paragraphs [0056]-[0151], and figures 1-33	1-7
Y	CN 104566909 A (NINGBO AUX AIR-CONDITION CO., LTD.), 29 April 2015 (29.04.2015), description, paragraphs [0056]-[0151], and figures 1-33	8-12
Y	CN 104315608 A (QINGDAO HAIER AIR CONDITIONER CO., LTD.), 28 January 2015 (28.01.2015), description, paragraphs [0056]-[0151], and figures 1-33	8-12
Y	CN 202328531 U (GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI), 11 July 2012 (11.07.2012), description, paragraphs [0033]-[0043], and figures 1-13	8-12
PX	CN 105091102 A (QINGDAO HAIER AIR CONDITIONER CO., LTD.), 25 November 2015 (25.11.2015), claims 1-12	1-12
PX	CN 204943673 U (QINGDAO HAIER AIR CONDITIONER CO., LTD.), 06 January 2016 (06.01.2016), claims 1-12	1-12
A	CN 103727588 A (LG ELECTRONICS INC.), 16 April 2014 (16.04.2014), the whole document	1-12

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

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	
"E" earlier application or patent but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	"&" document member of the same patent family

Date of the actual completion of the international search

11 September 2016 (11.09.2016)

Date of mailing of the international search report

30 September 2016 (30.09.2016)

Name and mailing address of the ISA/CN:
State Intellectual Property Office of the P. R. China
No. 6, Xitucheng Road, Jimenqiao
Haidian District, Beijing 100088, China
Facsimile No.: (86-10) 62019451

Authorized officer

JI, Hongjun

Telephone No.: (86-10) 62089997

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2016/086684

5

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

10

15

20

25

30

35

40

45

50

55

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 104596077 A (GUANGDONG MIDEA HEATING & VENTILATION EQUIPMENT CO., LTD. et al.), 06 May 2015 (06.05.2015), the whole document	1-12
A	CN 202254166 U (GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI), 30 May 2012 (30.05.2012), the whole document	1-12
A	EP 1950501 A1 (LG ELECTRONICS INC.), 30 July 2008 (30.07.2008), the whole document	1-12

Form PCT/ISA/210 (continuation of second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2016/086684

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CN 104566909 A	29 April 2015	None	
CN 104315608 A	28 January 2015	CN 204141826 U	04 February 2015
		WO 2016000409 A1	07 January 2016
		CN 104329733 A	04 February 2015
		CN 104315696 A	28 January 2015
		WO 2016000404 A1	07 January 2016
		CN 104329763 A	04 February 2015
		WO 2016000413 A1	07 January 2016
CN 202328531 U	11 July 2012	None	
CN 105091102 A	25 November 2015	None	
CN 204943673 U	06 January 2016	None	
CN 103727588 A	16 April 2014	US 9255722 B2	09 February 2016
		EP 2719969 A1	16 April 2014
		US 2014097730 A1	10 April 2014
		KR 20140046667 A	21 April 2014
CN 104596077 A	06 May 2015	None	
CN 202254166 U	30 May 2012	None	
EP 1950501 A1	30 July 2008	None	

Form PCT/ISA/210 (patent family annex) (July 2009)