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

(57) Provided is an outdoor unit of an air conditioner. The outdoor unit includes a heat exchanger in which outdoor air is heat-exchanged with a refrigerant, a fan through which the outdoor air forcedly flows, a motor for driving the fan, a motor fixing part for fixing the motor, a base pan to which the motor fixing part is coupled to a top surface thereof, and a guide part for guiding the motor fixing part such that the motor fixing part is seated in position.

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Description

BACKGROUND OF THE INVENTION

[0001] Embodiments relate to an outdoor unit of an air conditioner.

[0002] In general, an air conditioner is an apparatus heating and cooling indoor space by performing a refrigerant cycle including compression-condensation-expansion-evaporation.

[0003] Such an air conditioner includes an indoor unit where refrigerant is heat-exchanged with indoor air, and an outdoor unit where the refrigerant is heat-exchanged with outdoor air. The indoor unit includes an indoor heat exchanger for heat-exchanging the indoor air with the refrigerant, a fan blowing the indoor air, and a motor rotating the fan. The outdoor unit includes an outdoor heat exchanger for heat-exchanging the refrigerant with the outdoor air, a fan for blowing the outdoor air, a motor for rotating the fan, a compressor compressing the refrigerant, an expansion part expanding the refrigerant, and a four-way valve changing a flow direction of the refrigerant.

[0004] When an indoor cooling operation is performed, the indoor heat exchanger serves as an evaporator, and the outdoor heat exchanger serves as a condenser. The four-way valve changing the flow direction of the refrigerant switches the heating and cooling operations to each other.

SUMMARY OF THE INVENTION

[0005] Embodiments provide an outdoor unit of an air conditioner that can be easily assembled.

[0006] In a preferred embodiment, an outdoor unit of an air conditioner comprises: a heat exchanger in which outdoor air is heat-exchanged with a refrigerant; a fan through which the outdoor air forcedly flows; a motor for driving the fan; a motor fixing part for fixing the motor; a base pan to which the motor fixing part is coupled to a top surface thereof; and a guide part for guiding the motor fixing part such that the motor fixing part is seated in position.

[0007] 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

[0008]

FIG. 1 is a perspective view illustrating an outdoor unit of an air conditioner according to an embodiment.

FIG. 2 is an exploded perspective view illustrating an outdoor unit of an air conditioner according to an embodiment.

FIG. 3 is a perspective view illustrating a base pan of an outdoor unit of an air conditioner according to an embodiment.

FIG. 4 is a perspective view illustrating an outdoor unit of an air conditioner in which a motor fixing part, a base pan, and a heat exchanger are coupled to each other according to an embodiment.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0009] Reference will now be made in detail to the embodiments of the present disclosure, examples of which are illustrated in the accompanying drawings.

[0010] 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 scope of the invention as defined by the claims. 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.

[0011] FIG. 1 is a perspective view illustrating an outdoor unit of an air conditioner according to an embodiment, and FIG. 2 is an exploded perspective view illustrating an outdoor unit of an air conditioner according to an embodiment.

[0012] Referring to FIGS. 1 and 2, an outdoor unit 10 of an air conditioner according to an embodiment includes various devices for a refrigerant flow, a fan motor assembly for blowing air, a partition 40 for partitioning inner space of the outdoor unit 10, a control box 60 for controlling the various devices and the fan motor assembly, and an outer case 50 defining an outer appearance. In detail, the various devices for the refrigerant flow includes a compressor 21 for compressing the refrigerant, a four-way valve 22 for changing a flow direction of the refrigerant, an expansion part 23 in which the refrigerant is expanded, a heat exchanger 25 for heat-exchange between the refrigerant and outdoor air, an accumulator 26 for separating a gaseous refrigerant from a liquid refrigerant, a refrigerant pipe 27 connecting the above-described devices to each other such that the refrigerant flows, an indoor unit for heat-exchange between the refrigerant and indoor air, and a connection pipe 28 connecting the indoor unit 80 to the refrigerant pipe 27.

[0013] The fan motor assembly includes a fan 31 generating an air-pressure difference due to rotation, a motor 33 providing a driving force for rotating the fan 31, and a

motor fixing part 35 for fixing the motor 33.

[0014] The partition 40 is provided between the fan motor assembly and the various devices for the refrigerant flow except the heat exchanger 25. That is, the inner space of the outdoor unit 10 is partitioned into a blowing region in which the fan motor assembly is installed and a device region in which the various devices for the refrigerant flow except the heat exchanger 25 are installed.

[0015] The control box 60 is seated on an upper end of the partition 40. A control panel 62 for fixing various electric wires connected to the control box 60 is coupled to a side of the control box 60.

[0016] The outer case 50 includes a front surface case 51 defining an outer appearance of a front surface, a pipe-side case 53 shielding the refrigerant pipe 27, a heat exchanger-side case 54 shielding a lateral surface of the heat exchanger 25, a top surface case 55 shielding a top surface, and a base pan 56 supporting the various devices for the refrigerant flow and the fan motor assembly.

[0017] In detail, an exhaust grill 52 exhausting air heat-exchanged through the heat exchanger 25 is provided in the front surface case 51. The exhaust grill 52 has a circular shape having a size equal to or greater than that of the fan 31 when viewed from a front side. In addition, the exhaust grill 53 is provided with a plurality of exhaust holes having a net shape.

[0018] A pipe fixing part 57 for fixing the refrigerant pipe 27 and the connection pipe 28 is coupled to the pipe-side case 53. A pipe cover 58 for shielding the pipe fixing part 57 and the connection pipe 28 is coupled to an outer surface of the pipe-side case 53.

[0019] A plurality of intake holes for sucking the outdoor air toward the heat exchanger 25 is defined in the heat exchanger-side case 54. A back surface intake grill 59 for sucking the indoor air is provided in a rear direction of the heat exchanger 25, i.e., a back surface of the outer case 50. A fixing support 70 for fixing and supporting the base pan 56 is provided under the base pan 56.

[0020] Hereinafter, a motor fixing part and a coupling structure between a motor fixing part and a heat exchanger in an outdoor unit of an air conditioner according to an embodiment will be described in detail.

[0021] FIG. 3 is a perspective view illustrating a base pan of an outdoor unit of an air conditioner according to an embodiment, and FIG. 4 is a perspective view illustrating an outdoor unit of an air conditioner in which a motor fixing part, a base pan, and a heat exchanger are coupled to each other according to an embodiment.

[0022] Referring to FIG. 3, a base pan 56 includes a motor fixing seat 563 on which a motor fixing part 35 is seated. The motor fixing seat 563 protrudes from a top surface of the base pan 56. A coupling part 564 for coupling the motor fixing part 35 and a guide part 565 for guiding the motor fixing part 35 such that the motor fixing part is seated in position are provided on the motor fixing seat 563. A portion of a top surface of the base pan 56 is cut, and then bent upwardly to form the coupling part 564 and the guide part 565. The guide part 565 has a width that narrows toward an end portion thereof and is horizontally disposed in front and rear directions. A coupling hole 566 through which a coupling unit (not shown) for coupling the motor fixing part 35 to the base pan 56 passes is defined in the coupling part 564.

[0023] Referring to FIG. 4, the motor fixing part 35 includes a motor support 351 for supporting a motor 33, a heat exchanger fixture 358 fixed to a heat exchanger 25, and a top surface case support 359 for supporting an top surface case 55 (See FIG. 2).

[0024] In detail, the motor support 351 has a frame shape having a length corresponding to that from the top surface of the base pan 56 to a bottom surface of the top surface case 55 in upward and downward directions. A lower end portion of the motor support 351 is bent forwardly in a "ㄱ"-shape (i.e., a right angle) with a predetermined length. A receiving part 352 for receiving the coupling part 564 of the base pan 56 and a receiving hole 353 for receiving the guide part 565 of the base pan 56 are provided on/in the lower end portion of the motor support 351. The receiving part 352 is formed in a front direction with a shape corresponding to that of the coupling part 564. The receiving hole 353 has a diamond shape having a section width that widens from both side end portions thereof toward a central portion. A coupling hole 360 is defined at a position corresponding to that of the coupling hole 566 of the coupling part 564 in the receiving part 352 overlapping with the coupling part 564 in front and rear directions in a state where the motor fixing part 35 is coupled to the base pan 56. A motor coupling part 354 for coupling the motor 33 is disposed at a central portion of the motor support 351.

[0025] The motor fixing part 35 includes an electric wire guide part 350 for guiding an electric wire connected to the motor 33. The electric wire guide part 350 includes an electric wire receiving part 355 for receiving the electric wire for supplying a power source to the motor 33, an electric wire hooking part 356 for hooking the electric wire, and an electric wire fixing part 357 for fixing the electric wire.

[0026] In detail, the electric wire guide part 350 is provided on the frame of the motor fixing part 35 having a "⊏"-shape (i.e., a squared-off "C"-shape) in section. The electric wire receiving part 355 is provided inside the electric wire guide part 350. Here, the electric wire receiving part 355 is opened in a direction opposite to that of the heat exchanger 25. A portion of the frame of the motor fixing part 35 is recessed in a direction in which the electric wire is bent to form the electric wire hooking part 356. One end of the frame of the motor fixing part 35 extends to form the electric wire fixing part 357. Here, the electric wire fixing part 357 has a width greater than that of the electric wire receiving part 355. A portion connecting the electric wire fixing part 357 to the frame of the motor fixing part 35 is slender such that the electric wire fixing part 367 is easily bent. In particular, in a state where the electric wire is received into the electric wire receiving part 355, the electric wire fixing part 357 may be bent in a

direction of the electric wire receiving part 355 to shield a portion of the electric wire receiving part 355.

[0027] The heat exchanger fixture 358 extends from an upper end of the motor support 351 toward a rear direction. An end portion of the heat exchanger fixture 358 is bent downwardly in a "ㄱ"-shape (i.e., a right angle) such that the heat exchanger 25 is not spaced a distance greater than a previously set distance from the motor fixing part 35.

[0028] The top surface case support 359 extends from the upper end of the motor support 351 toward a front direction. An end portion of the top surface case support 359 is bent in a "ㄱ"-shape (i.e., a right angle) such that the end portion of the top surface case support 359 is coupled to the front surface case 51 in a state where the front surface case (See reference numeral 51 of FIG. 2), the base pan 56, and the motor fixing part 35 are coupled to each other.

[0029] According to the above-described motor fixing part 35, the motor fixing part 35 is easily coupled to the base pan 56. In detail, when the guide part 565 is in contact with a portion of the receiving hole 353, the guide part 565 is automatically guided toward a center of the receiving hole 353 due to interference between the guide part 565 and the receiving hole 353. That is, since the coupling part 564 of the motor support 351 and the coupling part 564 of the base pan 56 are smoothly guided up to a position overlapping with each other by the guide part 565 and the receiving hole 353, the coupling operation may be further facilitated. In detail, since the coupling hole 566 of the coupling part 565 and the coupling hole 360 of the receiving part 352 are correspondingly guided in the front and rear directions, the coupling operation may be further facilitated.

[0030] Also, since the electric wire is cleanly received and fixed, the appearance of the outdoor unit can be improved. In addition, it can prevent the electric wire from being caught on the rotating fan 31. Also, it can prevent the electric wire from being separated due to generation of a further larger tension when the electric wire is intended to be separated in a state where the electric wire is hooked on the electric wire hooking part 356. Thus, it can prevent the electric wire from being automatically separated from the electric wire hooking part 356. Since the electric wire receiving part 355 is opened in a fan direction, but a heat exchanger direction, a phenomenon in which the airflow is interrupted by the motor support 351 during the operation of the outdoor unit 10 can be minimized.

[0031] Although embodiments have been described with reference to a number of illustrative embodiments thereof, it should be understood that numerous other modifications and embodiments can be devised by those skilled in the art. More particularly, various variations and modifications are possible in the component parts and/or arrangements of the subject combination arrangement within the scope of the invention as defined by the appended claims. In addition to variations and modifications in the component parts and/or arrangements, alternative uses will also be apparent to those skilled in the art.

Claims

1. An outdoor unit of an air conditioner, comprising: a heat exchanger in which outdoor air is heat-exchanged with a refrigerant; a fan through which the outdoor air forcedly flows; a motor for driving the fan; a motor fixing part for fixing the motor; a base pan to which the motor fixing part is coupled to a top surface thereof, the outdoor unit further comprising:

   a guide part for guiding the motor fixing part such that the motor fixing part is seated in position.

2. The outdoor unit according to claim 1, wherein the guide part comprises:

   a protrusion disposed on one of the base pan and a lower end portion of the motor fixing part; and
   a hole defined in the other of the base pan and the lower end portion of the motor fixing part.

3. The outdoor unit according to claim 2, wherein the protrusion has a shape that narrows toward an upper end thereof, and the hole has a section width that widens toward a central portion thereof.

4. The outdoor unit according to claim 1, wherein coupling holes through which coupling units for coupling the motor fixing part to the base pan pass are defined in the motor fixing part and the base pan, respectively,
   and the coupling holes of the motor fixing part and the base pan correspond to each other when the motor fixing part is seated in position with respect to the base pan.

5. The outdoor unit according to claim 1, wherein an electric wire guide part for a wiring of an electric wire connected to the motor is disposed on the motor fixing part, and

   the electric wire guide part comprises:
   an electric wire receiving part disposed on an edge portion of a side of the motor fixing part to receive the electric wire;
   an electric wire fixing part protruding forwardly from the motor fixing part, a portion of the electric wire fixing part being bent to fix the electric wire; and
   an electric wire hooking part recessed from a circumference of the motor fixing part to hook the electric wire extending along the electric wire receiving part.

6. The outdoor unit according to claim 5, wherein the electric wire receiving part is opened in a direction opposite to that of the heat exchanger.

7. The outdoor unit according to claim 5, wherein the electric wire hooking part is recessed in a direction in which the electric wire is bent.

FIG.1

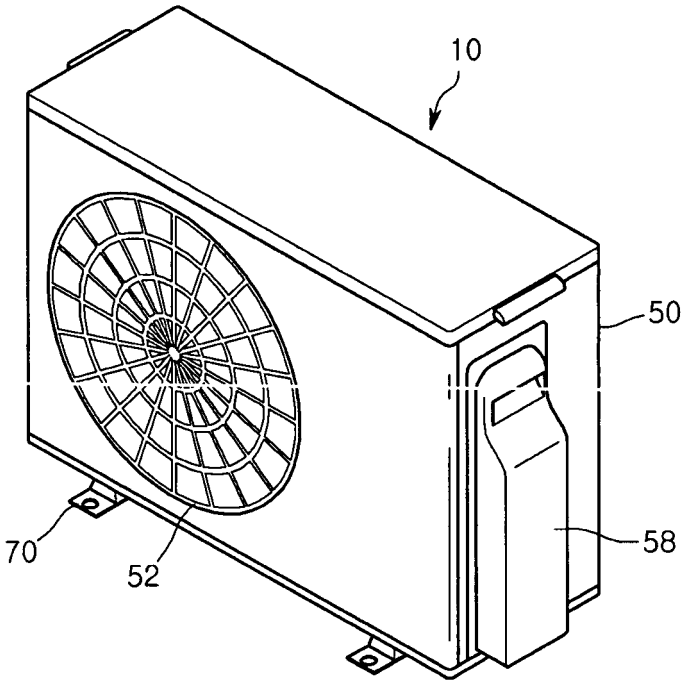

FIG.2

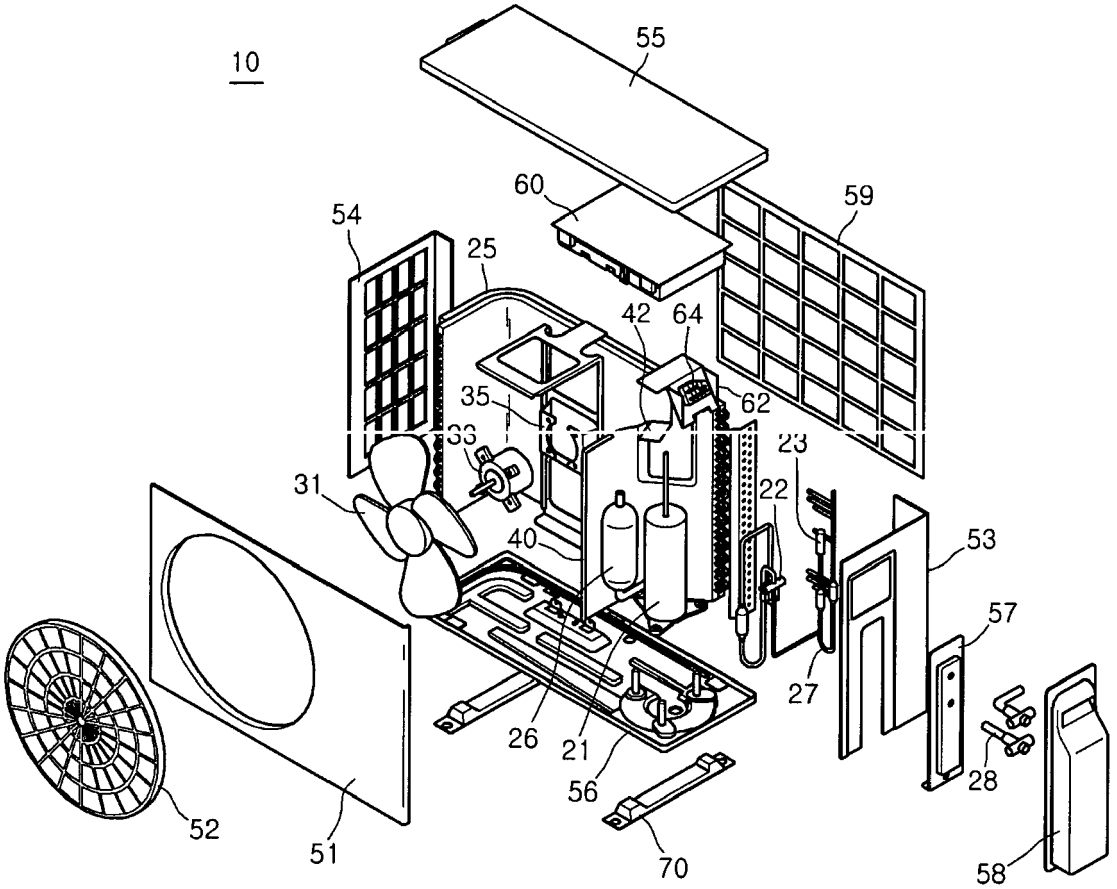
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FIG.3

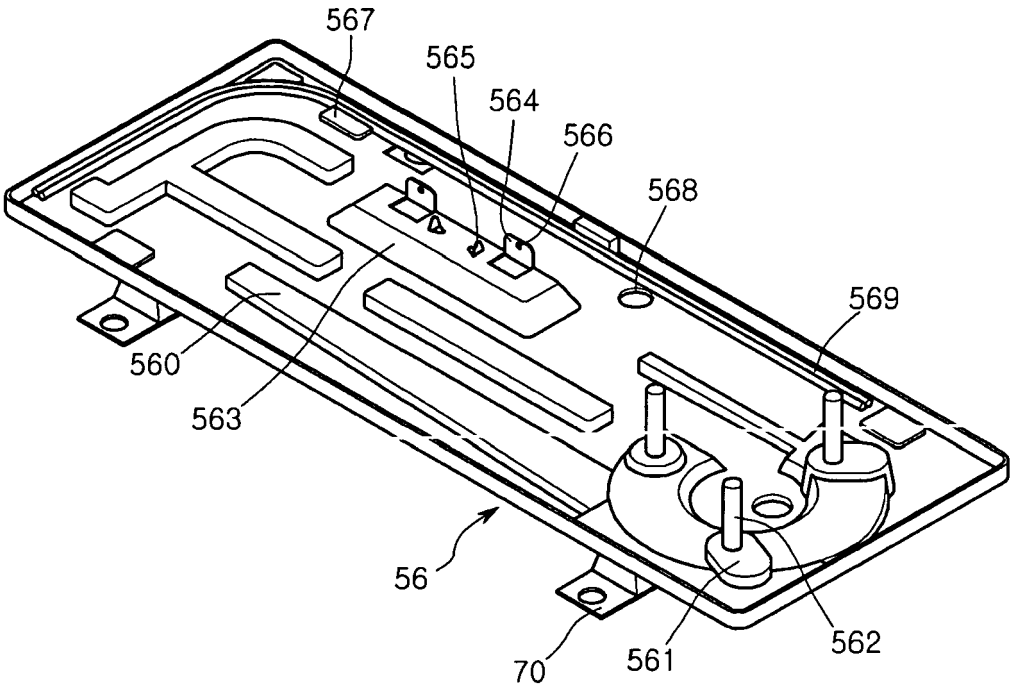
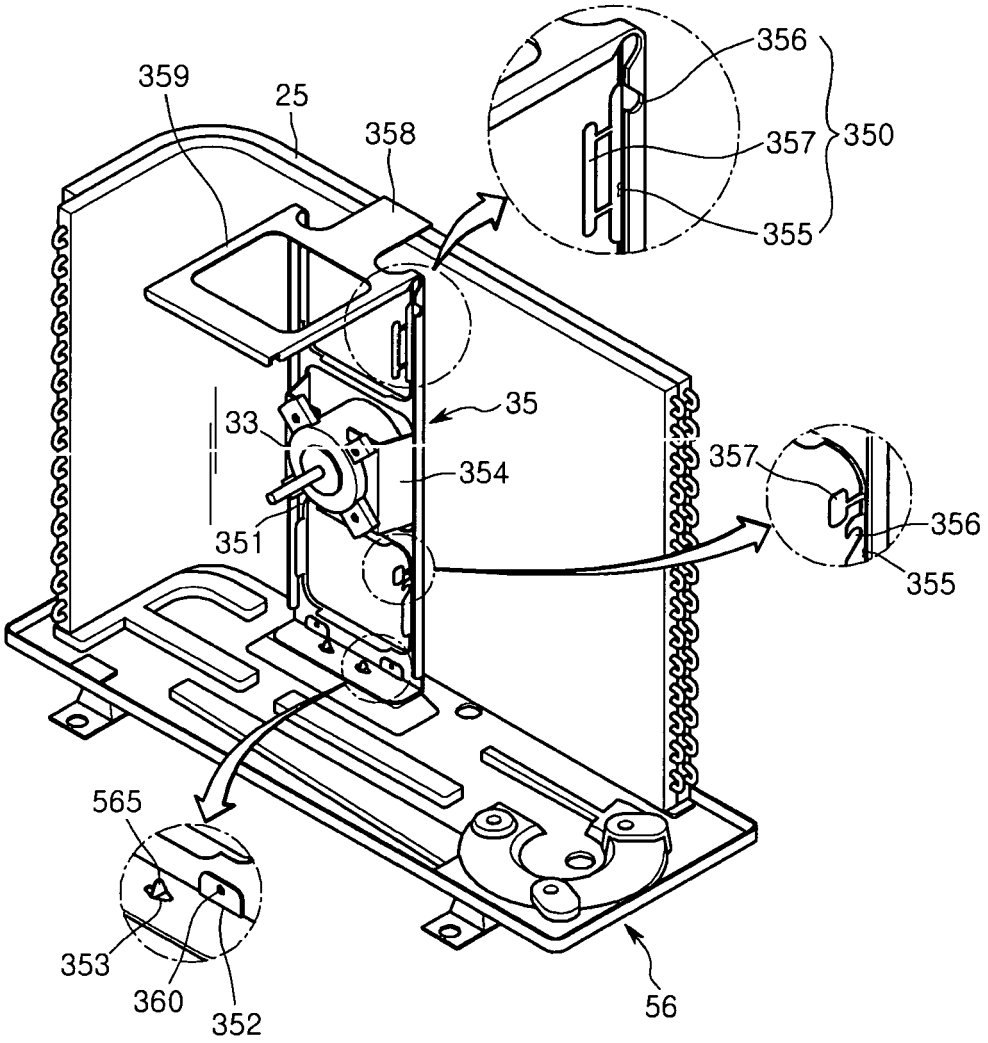


FIG.4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