

(19)



(11)

EP 2 180 266 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:

16.11.2016 Bulletin 2016/46

(51) Int Cl.:

F24F 1/00 ^(2011.01)

F24F 1/46 ^(2011.01)

F24F 13/20 ^(2006.01)

F24F 1/06 ^(2011.01)

F24F 1/38 ^(2011.01)

F24F 1/20 ^(2011.01)

(21) Application number: **09250495.0**

(22) Date of filing: **24.02.2009**

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

Außenraumeinheit für Klimaanlage

Unité extérieure pour climatiseur

(84) Designated Contracting States:

**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 SE SI SK TR**

(30) Priority: **27.10.2008 KR 20080105208**

(43) Date of publication of application:

28.04.2010 Bulletin 2010/17

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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.

[0005] JP2005 140380A discloses an outdoor unit of an air conditioner in which the fan motor support is divided into a pair of left and right posts.

SUMMARY OF THE INVENTION

[0006] According to the present invention, there is provided an outdoor unit of an air conditioner as set out in claim 1.

[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.

[0013] 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.

[0014] 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.

[0015] 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.

[0016] 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.

[0017] 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.

[0018] 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.

[0019] 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.

[0020] 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.

[0021] 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.

[0022] 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.

[0023] 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.

[0024] 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).

[0025] 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 "┐"-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.

[0026] 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.

[0027] 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.

[0028] 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 "┐"-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.

[0029] 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 "┐"-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.

[0030] 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.

[0031] 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.

Claims

1. An outdoor unit of an air conditioner, comprising:

a heat exchanger (25) in which outdoor air is heat-exchanged with a refrigerant; a fan (31) through which the outdoor air forcedly flows; a motor (33) for driving the fan (31); a motor fixing part (35) for fixing the motor (33); a base pan (56) to which the motor fixing part (35) is coupled to a top surface thereof,

characterised in that the outdoor unit further comprises:

a guide part and a receiving hole (355, 565) for guiding the motor fixing part (35) such that the motor fixing part (35) is seated in position, a coupling part (564) for coupling the motor fixing part (35) provided on a motor fixing seat (563); and a receiving part (352) for receiving the coupling part (564) of the base pan (56) provided on the lower end portion of the motor fixing part (35),

wherein the guide part and receiving hole (363, 565) comprises:

a protrusion (565) disposed on one of the base pan (56) and a lower end portion of the motor fixing part (35); and a hole (353) defined in the other of the base pan (56) and the lower end portion of the motor fixing part (35).

2. The outdoor unit according to claim 1, wherein the protrusion (565) has a shape that narrows toward an upper end thereof, and the hole (353) has a section width that widens toward a central portion thereof.

3. 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 coupling part (564) and the receiving part (352), respectively, and the coupling holes (360, 566) of the coupling part (352) and the receiving part (352) correspond to each other when the motor fixing part (35) is seated in position with respect to the base pan (56).

4. The outdoor unit according to claim 1, wherein an electric wire guide part (350) for a wiring of an electric wire connected to the motor (33) is disposed on the motor fixing part (35), and the electric wire guide part (350) comprises:

an electric wire receiving part (355) disposed on an edge portion of a side of the motor fixing part (35) to receive the electric wire; an electric wire fixing part (357) protruding forwardly from the motor fixing part (35), a portion of the electric wire fixing part (357) being bent to fix the electric wire; and an electric wire hooking part (356) recessed from a circumference of the motor fixing part (35) to hook the electric wire extending along the electric wire receiving part (355).

5. The outdoor unit according to claim 4, wherein the electric wire receiving part (355) is opened in a di-

rection opposite to that of the heat exchanger (25).

6. The outdoor unit according to claim 4, wherein the electric wire hooking part (356) is recessed in a direction in which the electric wire is bent.

Patentansprüche

1. Außeneinheit einer Klimaanlage umfassend:

einen Wärmetauscher (25), in welchem ein Wärmeaustausch von Außenluft mit einem Kältemittel erfolgt; einen Lüfter (31), durch welchen die Außenluft erzwungen strömt; einen Motor (33) zum Antreiben des Lüfters (31); einen Motorfixierteil (35) zum Fixieren des Motors (33); eine Basispfanne (56), mit welcher der Motorfixierteil (35) an einer Oberseite davon gekoppelt ist, **dadurch gekennzeichnet, dass** die Außeneinheit ferner umfasst:

einen Führungsteil und ein Aufnahmeloch (355, 565) zum Führen des Motorfixierteils (35) in der Art, dass der Motorfixierteil (35) in Position eingepasst ist, einen Kopplungsteil (564) zum Koppeln des Motorfixierteils (35) und bereitgestellt auf einem Motorfixiersitz (563); und einen Aufnahmeteil (352) zum Aufnehmen des Kopplungsteils (564) der Basispfanne (56) und bereitgestellt an dem unteren Endbereich des Motorfixierteils (35),

wobei der Führungsteil und das Aufnahmeloch (363, 565) umfassen:

einen Vorsprung (565) angeordnet an einem von der Basispfanne (56) und einem unteren Endbereich des Motorfixierteils (35); und ein Loch (353) definiert in dem anderen von der Basispfanne (56) und dem unteren Endbereich des Motorfixierteils (35).

2. Außeneinheit nach Anspruch 1, wobei der Vorsprung (565) eine Form aufweist, die sich hin zu einem oberen Ende davon verengt, und wobei das Loch (353) eine Bereichsbreite aufweist, die sich hin zu einem zentralen Bereich davon verbreitert.
3. Außeneinheit nach Anspruch 1, wobei Kopplungslöcher, durch welche Kopplungseinheiten zum Koppeln des Motorfixierteils an der Basispfanne hindurch treten, in dem Kopplungsteil (564) und dem Aufnahmeteil (352) respektive definiert sind und wobei die Kopplungslöcher (360, 566) des Kopplungsteils (352) und des Aufnahmeteils (352)

einander entsprechen, wenn der Motorfixierteil (35) in Position mit Bezug auf die Basispfanne (56) eingepasst ist.

4. Außeneinheit nach Anspruch 1, wobei ein Elektrodrahtführungsteil (350) zum Verdrahten eines Elektrodrahtes, der mit dem Motor (33) verbunden ist, an dem Motorfixierteil (35) angeordnet ist und wobei der Elektrodrahtführungsteil (350) umfasst:

einen Elektrodrahtaufnahmeteil (355), der an einem Randbereich einer Seite des Motorfixierteils (35) angeordnet ist, um den Elektrodraht aufzunehmen;

einen Elektrodrahtfixierteil (357), der von dem Motorfixierteil (35) nach vorne vorsteht, wobei ein Bereich des Elektrodrahtfixierteils (357) gebogen ist, um den Elektrodraht zu fixieren; und einen Elektrodrahtthakenteil (356), der von einem Umfang des Motorfixierteils (35) zurückgesetzt ist, um den Elektrodraht zu verhaken, der sich entlang des Elektrodrahtaufnahmeteils (355) erstreckt.

5. Außeneinheit nach Anspruch 4, wobei der Elektrodrahtaufnahmeteil (355) in einer Richtung gegenüberliegend zu dem Wärmetauscher (25) offen ist.

6. Außeneinheit nach Anspruch 4, wobei der Elektrodrahtthakenteil (356) zurückgesetzt in einer Richtung ist, in welcher der Elektrodraht gebogen ist.

Revendications

1. Unité extérieure d'un climatiseur, comprenant :

un échangeur de chaleur (25) dans lequel l'air extérieur subit un échange de chaleur avec un fluide frigorigène ; un ventilateur (31) à travers lequel l'air extérieur circule de manière forcée ; un moteur (33) pour entraîner le ventilateur (31) ; une partie de fixation (35) de moteur pour fixer le moteur (33) ; un plateau de base (56) auquel la partie de fixation (35) de moteur est couplée au niveau d'une surface supérieure de celui-ci,

caractérisée en ce que l'unité extérieure comprend en outre :

une partie de guidage et un trou de réception (355, 565) pour guider la partie de fixation (35) de moteur de sorte que la partie de fixation (35) de moteur soit placée en position, une partie de couplage (564) pour coupler la partie de fixation (35) de moteur prévue sur un siège (563) de fixation de moteur ; et

une partie de réception (352) pour recevoir la partie de couplage (564) du plateau de base (56) prévue sur la partie d'extrémité inférieure de la partie de fixation (35) de moteur,

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dans laquelle la partie de guidage et le trou de réception (363, 565) comprennent :

une saillie (565) disposée sur l'un(e) parmi le plan de base (56) et une partie d'extrémité inférieure de la partie de fixation (35) de moteur ; et

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un trou (353) défini dans l'autre parmi le plan de base (56) et la partie d'extrémité inférieure de la partie de fixation (35) de moteur.

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2. Unité extérieure selon la revendication 1, dans laquelle la saillie (565) a une forme qui se réduit en direction d'une extrémité supérieure de celle-ci, et le trou (353) a une largeur de section qui s'élargit en direction d'une partie centrale de celui-ci.

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3. Unité extérieure selon la revendication 1, dans laquelle des trous de coulage, à travers lesquels passent des unités de couplage pour coupler la partie de fixation de moteur au plateau de base, sont définis dans la partie de coulage (564) et la partie de réception (352), respectivement, et les trous de coulage (360, 566) de la partie de coulage (352) et de la partie de réception (352) correspondent les uns aux autres lorsque la partie de fixation (35) de moteur est placée en position par rapport au plan de base (56).

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4. Unité extérieure selon la revendication 1, dans laquelle une partie de guidage (350) de fil électrique pour un câblage d'un fil électrique relié au moteur (33) est disposée sur la partie de fixation (35) de moteur, et la partie de guidage (350) de fil électrique comprend :

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une partie de réception (355) de fil électrique disposée sur une portion de bord d'un côté de la partie de fixation (35) de moteur pour recevoir le fil électrique ;

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une partie de fixation (357) de fil électrique faisant saillie vers l'avant à partir de la partie de fixation (35) de moteur, une portion de la partie de fixation (357) de fil électrique étant pliée pour fixer le fil électrique ; et

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une partie d'accrochage (563) de fil électrique évidée à partir d'une circonférence de la partie de fixation (35) de moteur pour accrocher le fil électrique s'étendant le long de la partie de réception (355) de fil électrique.

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5. Unité extérieure selon la revendication 4, dans laquelle la partie de réception (355) le fil électrique est ouverte dans une direction opposée à celle de l'échangeur de chaleur (25).

6. Unité extérieure selon la revendication 4, dans laquelle la partie d'accrochage (356) de fil électrique est évidée dans une direction dans laquelle le fil électrique est plié.

FIG.1

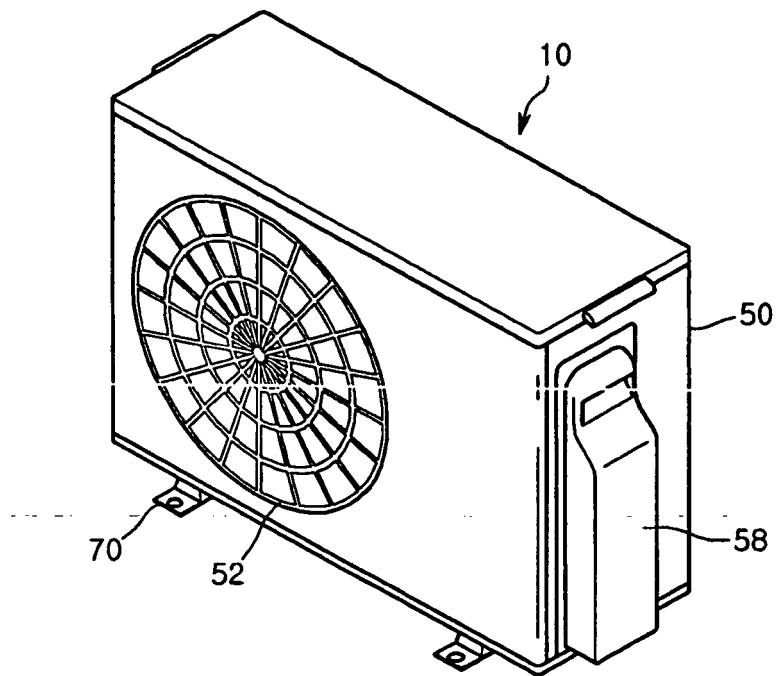


FIG.2

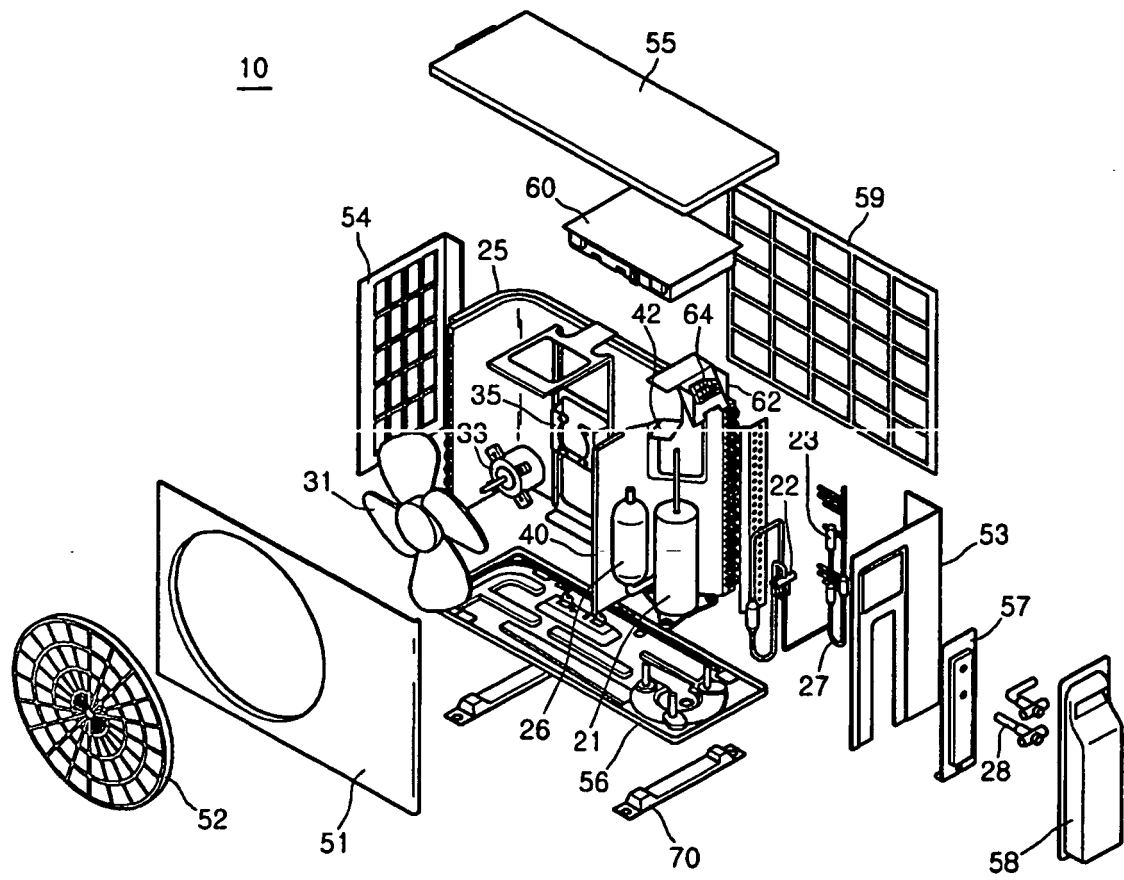


FIG.3

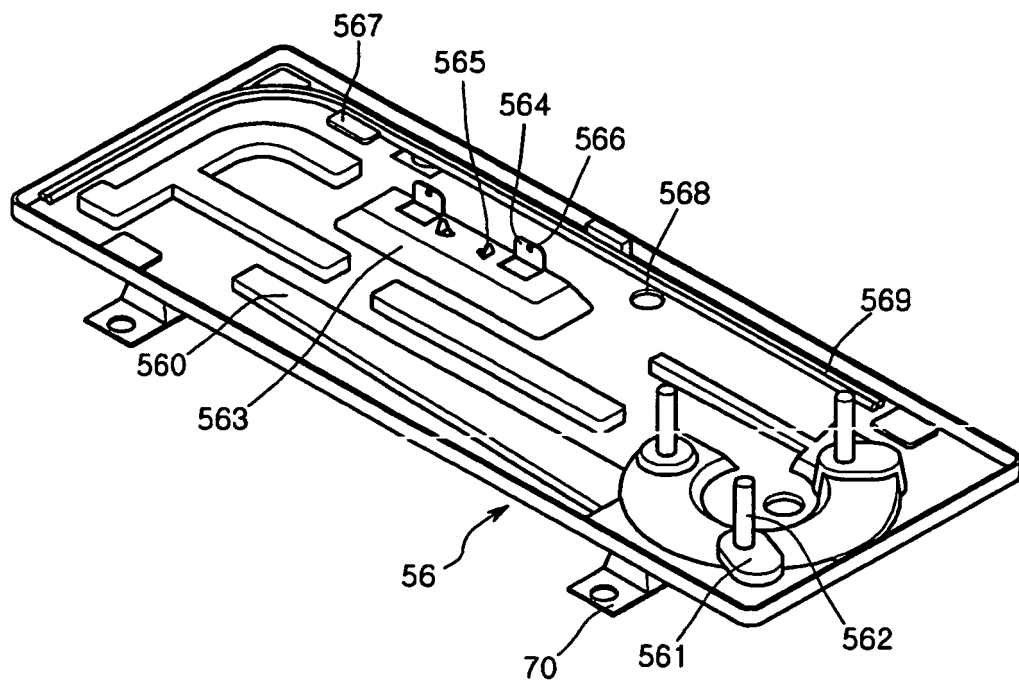
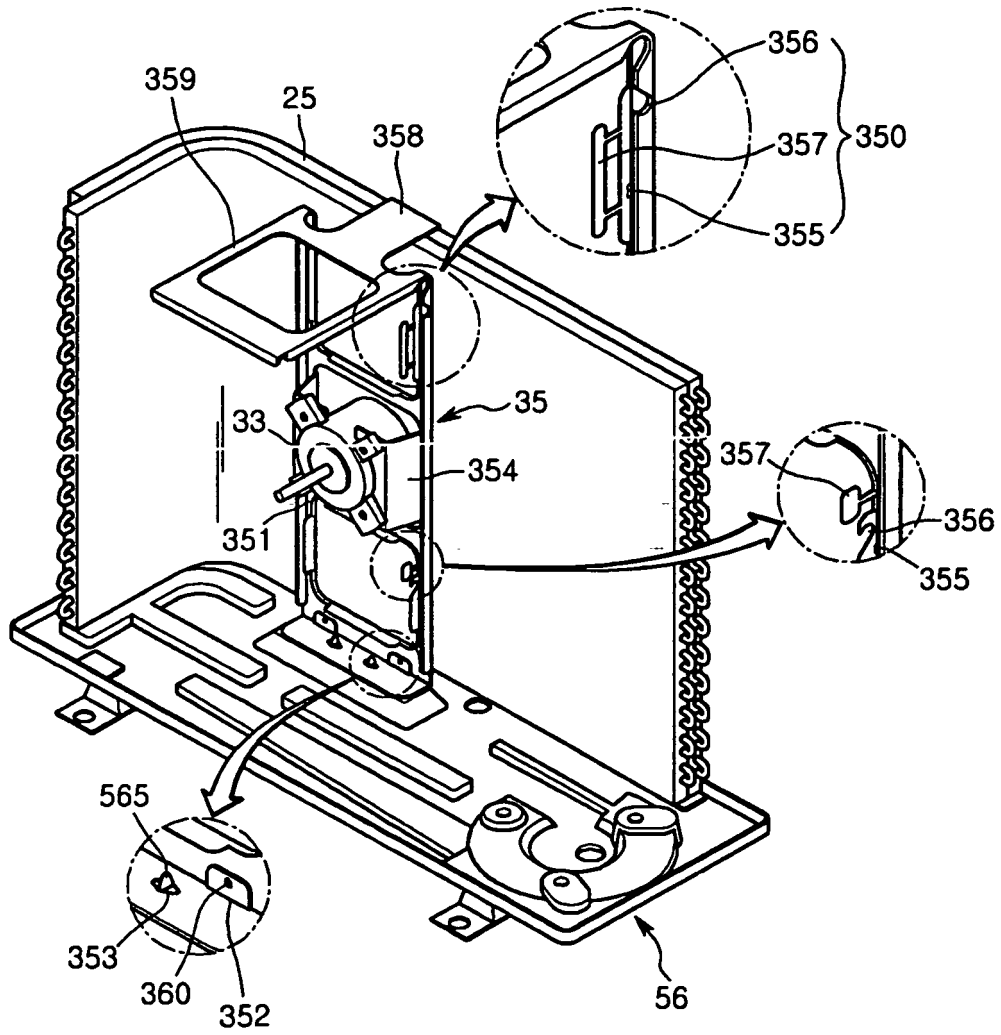


FIG.4



REFERENCES CITED IN THE DESCRIPTION

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