



(11)

EP 2 787 289 A1

(12)

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

(43) Date of publication:
08.10.2014 Bulletin 2014/41

(51) Int Cl.:
F24F 1/36 ^(2011.01) **F24F 1/16** ^(2011.01)
F24F 1/56 ^(2011.01)

(21) Application number: **12854174.5**

(86) International application number:
PCT/JP2012/079085

(22) Date of filing: **09.11.2012**

(87) International publication number:
WO 2013/080772 (06.06.2013 Gazette 2013/23)

(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

(30) Priority: **30.11.2011 JP 2011261105**

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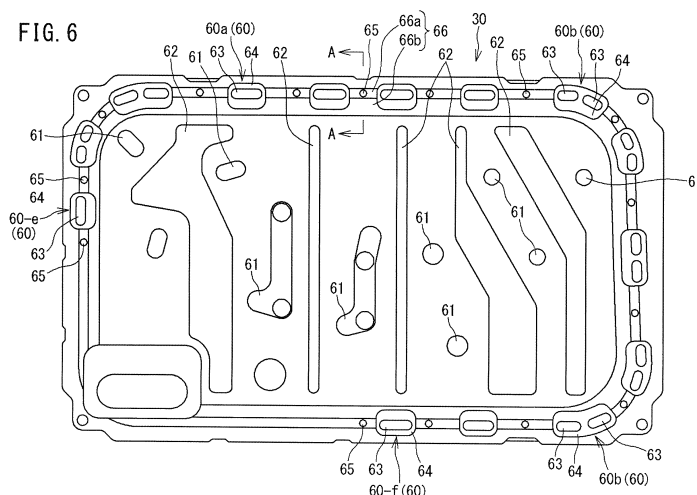
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(54) **OUTDOOR MACHINE FOR AN AIR-CONDITIONING DEVICE**

(57) An outdoor unit 2 of an air conditioning device 1 in which a heat exchanger 13 is arranged in a bottom plate 30 in a substantially rectangular parallelepiped shape casing 22 including a top plate 31, side plates 44, 54 and 55, and the bottom plate 30 is provided. The heat exchanger 13 is mounted on a plurality of expanded portions 60 formed in the bottom plate 30. A first drainage

hole 63 through which a drainage fluid from the heat exchanger 13 is discharged to an exterior is formed in each of the expanded portions 60, and a second drainage hole 65 smaller than the first drainage hole 63 is formed in the bottom plate 30 under the heat exchanger 13 excluding the expanded portions 60.



Description

TECHNICAL FIELD

[0001] The present invention relates to an outdoor unit of an air conditioning device. In further detail, the present invention relates to an outdoor unit of an air conditioning device in which a structure of a bottom plate of a casing of the outdoor unit is improved.

BACKGROUND ART

[0002] An outdoor unit of an air conditioning device is generally formed in a rectangular parallelepiped shape, in which a compressor, an outdoor heat exchanger, and the like are accommodated in a casing including a top plate, side plates, and a bottom plate manufactured by a steel plate.

[0003] In such an outdoor unit of a type in which an outdoor heat exchanger is mounted on a bottom plate, it is known that in order to efficiently discharge a drainage fluid dropped after frost attached to fins of the outdoor heat exchanger is melted at the time of defrosting to an exterior, drainage holes are formed in the bottom plate under the outdoor heat exchanger (for example, refer to Patent Literatures 1 and 2). In the outdoor unit described in Patent Literatures 1 and 2, supplementary drainage holes for discharging a drainage fluid incapable of being discharged through the discharge holes under the outdoor heat exchanger are formed in a bottom plate part not under the outdoor heat exchanger.

CITATION LIST

[PATENT LITERATURES]

[0004]

Patent Literature 1: Japanese Unexamined Patent Publication No. 10-300131

Patent Literature 2: Japanese Unexamined Patent Publication No. 2010-071531

SUMMARY OF INVENTION

TECHNICAL PROBLEM

[0005] When the drainage holes of the drainage fluid are provided at positions away from a point where the drainage fluid generated at the time of defrosting is dropped (positions under fins of the outdoor heat exchanger), there is a fear that the drainage fluid is frozen again while the drainage fluid dropped from the fins of the outdoor heat exchanger is reaching the drainage holes. Thus, the drainage holes are desirably concentrated under the outdoor heat exchanger.

[0006] As a method of concentrating the drainage holes under the outdoor heat exchanger, it is thought to

increase an area of the drainage holes as far as possible. However, with this method, there is a problem that strength of the bottom plate is lowered.

[0007] The present invention is achieved in consideration with the situation described above, and an objective thereof is to provide an outdoor unit of an air conditioning device capable of increasing an opening area for discharging a drainage fluid under a heat exchanger while ensuring strength of a bottom plate.

SOLUTION TO PROBLEM

[0008] (1) An outdoor unit of an air conditioning device (hereinafter, also simply referred to as the "outdoor unit") of the present invention is an outdoor unit of an air conditioning device in which a heat exchanger is arranged in a bottom plate in a substantially rectangular parallelepiped shape casing including a top plate, side plates, and the bottom plate, wherein the heat exchanger is mounted on a plurality of expanded portions formed in the bottom plate, a first drainage hole through which a drainage fluid from the heat exchanger is discharged to an exterior is formed in each of the expanded portions, and a second drainage hole smaller than the first drainage hole is formed in the bottom plate under the heat exchanger excluding the expanded portions.

[0009] In the outdoor unit of the present invention, the heat exchanger is mounted on the plurality of expanded portions formed in the bottom plate forming the casing. The first drainage hole through which the drainage fluid is discharged to the exterior is formed in each of the expanded portions on which the heat exchanger is mounted, and the second drainage hole smaller than the first drainage hole is formed in the bottom plate under the heat exchanger excluding the expanded portions. Thus, the drainage fluid dropped from fins of the heat exchanger at the time of defrosting can be efficiently discharged from the drainage hole to the exterior. The first drainage hole is formed in the expanded portion whose strength is increased. Thus, an opening area thereof can be larger, so that discharge efficiency of the drainage fluid can be improved.

[0010] The first drainage hole and the second drainage hole are formed under the heat exchanger. Thus, the drainage fluid from the heat exchanger can be promptly discharged to the exterior, so as to avoid a problem that "the drainage fluid is frozen again" as in a case where a drainage fluid is discharged from a drainage hole formed at a point away from a position under a heat exchanger.

[0011] (2) In the above outdoor unit of (1), the second drainage hole may be formed between the adjacent expanded portions. In this case, the drainage fluid not discharged from the first drainage hole which is formed in the expanded portion can be promptly discharged from the second drainage hole to the exterior.

[0012] (3) In the above outdoor unit of (1) or (2), preferably, the first drainage hole is formed at a position close

to the windward side of an airflow passing through the heat exchanger. Frost is often attached to the fins on the windward side of the heat exchanger. By forming the first drainage hole at the position close to the windward side of the airflow passing through the heat exchanger in the expanded portion, the drainage fluid can be efficiently discharged to the exterior.

[0013] (4) In the above outdoor unit of (1) to (3), the expanded portions may be formed in a long circle shape and arranged at predetermined intervals along a planar shape of the heat exchanger.

[0014] (5) In the above outdoor unit of (4), the first drainage hole may be a long hole, and may be formed in each of the expanded portions in such a manner that a long axis of the long hole is along the longitudinal direction of the expanded portion.

ADVANTAGEOUS EFFECTS OF INVENTION

[0015] According to the outdoor unit of the air conditioning device of the present invention, the opening area for discharging the drainage fluid under the heat exchanger can be increased while ensuring strength of the bottom plate.

BRIEF DESCRIPTION OF DRAWINGS

[0016]

[FIG. 1] FIG. 1 is a pattern diagram showing a refrigerant circuit of an air conditioning device having an outdoor unit according to one embodiment of the present invention.

[FIG. 2] FIG. 2 is a perspective view of the embodiment of the outdoor unit of the present invention.

[FIG. 3] FIG. 3 is a perspective view showing a state where a top plate and side plates of the outdoor unit shown in FIG. 2 are removed.

[FIG. 4] FIG. 4 is an illustrative plan view showing the upper part side inside the outdoor unit shown in FIG. 2.

[FIG. 5] FIG. 5 is an illustrative plan view showing the lower part side inside the outdoor unit shown in FIG. 2.

[FIG. 6] FIG. 6 is an illustrative plan view of a bottom plate in the outdoor unit shown in FIG. 2.

[FIG. 7] FIG. 7 is a sectional view taken along the line A-A of FIG. 6.

DESCRIPTION OF EMBODIMENTS

[0017] Hereinafter, an embodiment of an outdoor unit of the present invention will be described in detail with reference to the attached drawings.

[0018] FIG. 1 is a pattern diagram showing a refrigerant circuit of an air conditioning device 1 having an outdoor unit 2 according to one embodiment of the present invention. The air conditioning device 1 is for example a

multiple type air conditioning device for a building in which a refrigerant circuit 10 is formed in such a manner that a plurality of indoor units 3 are connected in parallel to one or a plurality of outdoor units 2 so as to circulate a refrigerant.

[0019] In the outdoor unit 2, compressors 11, a four way valve 12, an outdoor heat exchanger 13, an outdoor expansion valve 14, fans 23, and the like are provided. In the indoor unit 3, an indoor expansion valve 15, an indoor heat exchanger 16, and the like are provided. The four way valve 12 and the indoor heat exchanger 16 are connected by a gas side refrigerant communication pipe 17a, and the outdoor expansion valve 14 and the indoor expansion valve 15 are connected by a liquid side refrigerant communication pipe 17b. A gas side stop valve 18 and a liquid side stop valve 19 are provided in terminal portions of the inside refrigerant circuit of the outdoor unit 2. The gas side stop valve 18 is arranged on the side of the four way valve 12, and the liquid side stop valve 19 is arranged on the side of the outdoor expansion valve 14. The gas side refrigerant communication pipe 17a is connected to the gas side stop valve 18, and the liquid side refrigerant communication pipe 17b is connected to the liquid side stop valve 19.

[0020] In the outdoor unit 2 of the present embodiment, the two compressors 11 are provided in parallel. The two compressors 11 may be combination of a variable-capacity inverter compressor for performing speed control by an inverter and a constant-capacity compressor of constant capacity for performing on-off control, or may be combination of two inverter compressors having the same capacity or different capacities or combination of two constant-capacity compressors.

[0021] In a case where a cooling operation is performed in the air conditioning device 1 with the above configuration, the four way valve 12 is retained in a state shown by solid lines in FIG. 1. A high temperature and high pressure gas refrigerant discharged from the compressors 11 flows into the outdoor heat exchanger 13 via the four way valve 12, and performs heat exchange with the outdoor air by actuation of the fans 23 so as to be condensed and liquefied. The liquefied refrigerant passes through the outdoor expansion valve 14 in a fully open state, and flows into the indoor units 3 through the liquid side refrigerant communication pipe 17b. In the indoor unit 3, pressure of the refrigerant is reduced to predetermined low pressure by the indoor expansion valve 15, and further, the refrigerant performs the heat exchange with the indoor air in the indoor heat exchanger 16 so as to be evaporated. The indoor air cooled by evaporation of the refrigerant is blown out to an interior by an indoor fan (not shown) so as to cool the interior. The refrigerant evaporated and gasified in the indoor heat exchanger 16 is returned to the outdoor unit 2 through the gas side refrigerant communication pipe 17a, and suctioned into the compressors 11.

[0022] Meanwhile, in a case where a heating operation is performed, the four way valve 12 is retained in a state

shown by broken lines in FIG. 1. A high temperature and high pressure gas refrigerant discharged from the compressors 11 flows into the indoor heat exchanger 16 of the indoor unit 3 via the four way valve 12, and performs the heat exchange with the indoor air so as to be condensed and liquefied. The indoor air heated by condensation of the refrigerant is blown out to the interior by the indoor fan so as to heat the interior. The refrigerant liquefied in the indoor heat exchanger 16 is returned to the outdoor unit 2 from the indoor expansion valve 15 in a fully open state through the liquid side refrigerant communication pipe 17b. The pressure of the refrigerant returned to the outdoor unit 2 is reduced to predetermined low pressure by the outdoor expansion valve 14, and further, the refrigerant performs the heat exchange with the outdoor air in the outdoor heat exchanger 13 so as to be evaporated. The refrigerant evaporated and gasified in the outdoor heat exchanger 13 is suctioned into the compressors 11 via the four way valve 12.

[0023] FIG. 2 is a perspective view of the embodiment of the outdoor unit of the present invention, FIG. 3 is a perspective view showing a state where a top plate and side plates of the outdoor unit shown in FIG. 2 are removed, and FIG. 4 is an illustrative plan view showing the upper part side inside the outdoor unit shown in FIG. 2.

[0024] The outdoor unit 2 has a casing 22, and the outdoor heat exchanger 13 arranged along side surfaces of this casing 22. The casing 22 is formed in a substantially rectangular parallelepiped shape by a steel plate or the like, and includes a bottom plate 30, a top plate 31, support pillars 32, lateral members 33a to 33d, side plates 44, 54, and 55, and the like.

[0025] As shown in FIGS. 2 and 3, the bottom plate 30 is formed in a square shape in a plan view and in particular, an oblong shape elongated in the left and right direction. Lower parts of the support pillars 32 are respectively coupled to four corners of the bottom plate 30 by coupling tools such as bolts. The support pillar 32 is formed by for example a substantially L shape angle bar to be fitted to a shape of a corner part of the bottom plate 30.

[0026] As shown in FIG. 2, the top plate 31 is formed in a square shape in a plan view which is the substantially same as the bottom plate 30, and arranged so as to have a gap above the bottom plate 30. Upper ends of the support pillars 32 are coupled to four corners of the top plate 31 by coupling tools such as bolts. Two square ventilating holes 35 are formed side by side in the left and right direction in the top plate 31, and grilles 36 for preventing invasion of foreign substances are provided in the ventilating holes 35.

[0027] As shown in FIG. 3, the lateral members 33a to 33d are arranged on the upper part side of the support pillars 32 at positions having a predetermined gap downward from the top plate 31, and bridged between the support pillars 32 adjacent to each other in the front and rear direction and the left and right direction. A framework of

the casing 22 is formed by structural members including the support pillars 32 and the lateral members 33a to 33d. The bottom plate 30, the top plate 31, and the side plates 44, 54, and 55 are attached to this framework by screws and bolts. A cover member 21 to be described later (refer to FIG. 3) also serves as a structural member (strength member) forming the framework of the casing 22.

[0028] As shown in FIG. 4, the lateral members 33a and 33b arranged on both the left and right sides of the casing 22, and the lateral member 33d arranged on the rear part side of the casing 22 are formed by a thin and long member having a rectangular or L shape section. Meanwhile, the lateral member (front lateral member) 33c arranged on the front part side of the casing 22 is formed by a plate material whose width w in the front and rear direction is formed to be slightly wide. An electric component unit 24 is arranged on this front lateral member 33c. That is, the front lateral member 33c is used as a support base of the electric component unit 24. The electric component unit 24 accommodates a control board for controlling the entire outdoor unit 2, an inverter board for controlling the compressors, and other electric parts inside a box shape casing. The electric component unit 24 is provided in a wide range occupying all or almost all the width in the left and right direction of the outdoor unit 2.

[0029] Two support bases 41 are bridged side by side in the left and right direction between the front lateral member 33c and the rear lateral member 33d. Motors 23a of the fans 23 are supported on the support bases 41. As shown in FIG. 3, bell mouths 42 surrounding outer circumferences of the fans 23 and forming ventilating routes are attached to the lateral members 33a to 33d. The electric component unit 24 has a protruding portion 24a protruding into a dead space between the two left and right fans 23 (between the bell mouths 42) in a center part in the left and right direction thereof. By this protruding portion 24a, inside capacity of the electric component unit 24 is increased.

[0030] As shown in FIG. 2, the upper part side plates 44 are provided on the four side surfaces of the casing 22 positioned between the lateral members 33a to 33d and the top plate 31. The fans 23, the bell mouths 42, and the electric component unit 24 (refer to FIG. 3) are covered by the upper part side plates 44 and the top plate 31 so as not to be exposed to an exterior. The upper part side plate 44 on a front surface may form a lid member for openably closing a front surface part of the electric component unit 24.

[0031] FIG. 5 is an illustrative plan view showing the lower part side inside the outdoor unit shown in FIG. 2. The devices such as the outdoor heat exchanger 13, the compressors 11, an accumulator 45, and oil separators 46 are mounted on an upper surface of the bottom plate 30 of the casing 22. The outdoor heat exchanger 13 is a fin and tube type heat exchanger of a so-called cross fin type, including a large number of aluminum fins 47 and

copper heat transfer tubes 48. The heat transfer tubes 48 form a refrigerant flow passage for circulating the refrigerant while performing the heat exchange with the air, and the plurality of heat transfer tubes 48 are provided in line in the up and down direction. The heat transfer tubes 48 pass through the plurality of fins 47 in an orthogonal manner, and are bent by 180 degrees in a U shape in side end portions on both sides of the outdoor heat exchanger 13 so as to extend in a zigzag manner. Only the U shape bent heat transfer tubes 48 (U shape pipes 48a) protrude in a one side end portion 13a of the outdoor heat exchanger 13, and ends of the heat transfer tubes 48 connected to a pipe group 49 including a capillary tube and a header tube in addition to the U shape bent heat transfer tubes 48 protrude in the other side end portion 13b.

[0032] The outdoor heat exchanger 13 is bent in a substantially square shape along the four side surfaces of the casing 22. Specifically, the outdoor heat exchanger 13 has a front heat exchange portion 50 along the side surface on the front side of the casing 22 (front surface), a right heat exchange portion 51 along the side surface on the right side, a rear heat exchange portion 52 along the side surface on the rear side (rear surface), and a left heat exchange portion 53 along the side surface on the left side. A part between the front heat exchange portion 50 and the right heat exchange portion 51, a part between the right heat exchange portion 51 and the rear heat exchange portion 52, and a part between the rear heat exchange portion 52 and the left heat exchange portion 53 are bent at 90 degrees or at an angle close to 90 degrees. In the present embodiment, a left end of the front heat exchange portion 50 forms the one side end portion 13a of the outdoor heat exchanger 13, and a front end of the left heat exchange portion 53 forms the other side end portion 13b.

[0033] The front heat exchange portion 50 is provided along a substantially right half range in the front surface of the casing 22. The left heat exchange portion 53 is provided along a substantially rear half range in the left side surface of the casing 22. Therefore, between the one side end portion 13a of the outdoor heat exchanger 13 and the other side end portion 13b, that is, in a left half of the front surface of the casing 22 and a front half of the left side surface, an opening portion 20 where the outdoor heat exchanger 13 does not exist is formed.

[0034] As shown in FIGS. 2 and 3, the opening portion 20 is divided into two by the support pillar 32. An opening portion 20a on the front surface of the casing 22 is closed by front side plates 54a and 54b, and an opening portion 20b on the left side surface of the casing 22 is closed by the left side plate 55. By removing the front side plates 54a and 54b and the left side plate 55, the opening portions 20a and 20b are opened, so that an interior and an exterior of the outdoor unit main body 22 can communicate with each other. It should be noted that in FIG. 2, a side surface part of the outdoor unit main body 22 other than the upper part side plates 44, the front side plates

54a and 54b, and the left side plate 55 is not provided with a side plate, and the outdoor heat exchanger 13 is exposed as it is. However, a side plate in which a ventilating hole for allowing circulation of the air is formed, or a grid shape member in which a plurality of wire rods are assembled in a grid shape may be provided in the side surface part of the outdoor unit main body 22 facing the outdoor heat exchanger 13.

[0035] As shown in FIG. 5, the stop valves 18 and 19 are supported via a bracket 57 so as to face the opening portion 20a on the front surface of the casing 22. The pipe group 49 is arranged in the vicinity of the opening portion 20b on the left side surface. The compressor 11a arranged on the left side of the two compressors 11 is arranged at such a position that the substantially entire compressor can be visually recognized from the front side via the opening portion 20a on the front surface. The compressor 11b arranged on the right side is arranged at such a position that the compressor comes in to the slightly right side of the opening portion 20a. The accumulator 45 and the oil separators 46 are arranged on the rear part side in the casing 22.

[0036] The devices such as the compressors 11 and the valves arranged inside the casing 22 are subjected to regular inspection and maintenance, and these tasks can be performed via the opening portion 20. A replacement task of the devices arranged in the casing 22 can also be performed via the opening portion 20. At the time of performing these tasks, when a tool to be used for the maintenance or the like and the devices and the like to be replaced are brought into contact with the U shape tubes 48a protruding from the side end portion 13a of the outdoor heat exchanger 13, there is a fear that the U shape tubes 48a are damaged. Thus, the cover member 21 for covering the U shape tubes 48a is provided in the outdoor unit 2 of the present embodiment, and the U shape tubes 48a are protected by this cover member 21.

[0037] The outdoor unit 2 of the present invention is characterized by a structure of the bottom plate 30 forming the above casing 22. FIG. 6 is an illustrative plan view of the bottom plate 30 in the outdoor unit 2 shown in FIG. 2, and FIG. 7 is a sectional view taken along the line A-A of FIG. 6.

[0038] As described above, the bottom plate 30 is formed in a square shape in a plan view and in particular, an oblong shape elongated in the left and right direction, and can be manufactured by pressing a steel plate. A plurality of expanded portions 60, specifically fourteen expanded portions 60 are formed in a peripheral edge portion of the bottom plate 30 to match a planar shape of the outdoor heat exchanger 13. The expanded portions 60 are not formed over the entire side length of all the four sides of the bottom plate 30. However, the expanded portions are arranged along at least a part of each of the sides. In the example shown in FIG. 6, the expanded portions 60 are arranged over the entire side length of the top side and the right side, and the expanded portions 60 are arranged only along a part of the side length of

the bottom side and the left side. The outdoor heat exchanger 13 is mounted on the expanded portions 60 arranged in a substantially C form in such a way.

[0039] Meanwhile, in a center part of the bottom plate 30, convex portions 61 for mounting the devices such as the compressors 11 and the accumulator 45 to be arranged in the space surrounded by the outdoor heat exchanger 13, and band shape recessed portions 62 for reinforcement are formed by pressing as well as the expanded portions 60. Positions and shapes of the convex portions 61 and the band shape recessed portions 62 can be appropriately selected in accordance with arrangement points of the devices such as the compressors 1, strength required in the bottom plate 30, or the like.

[0040] The expanded portions 60 in the present embodiment have small expanded portions 60a having a small mount area, and large expanded portions 60b having a larger mount area than that of the small expanded portions 60a. Both the small expanded portions 60a and the large expanded portions 60b are formed in a long circle shape. One long hole 63 is formed in each of the small expanded portions 60a, and two long holes 63 are formed in each of the large expanded portions 60b. The long holes 63 function as drainage holes (first drainage holes) through which a drainage fluid dropped after frost attached to the fins of the outdoor heat exchanger 13 is melted at the time of defrosting is directly discharged to an exterior. Any of the long holes 63 is formed in such a manner that a long axis thereof is along the longitudinal direction of the small expanded portion 60a and the large expanded portion 60b. The two long holes 63 formed in the large expanded portion 60b are continuously formed while having a predetermined gap between the long holes along the longitudinal direction of the large expanded portion 60b.

[0041] The long holes 63 serving as drainage fluid discharge holes are formed in the expanded portions 60 on which the outdoor heat exchanger 13 is mounted, that is, formed under the outdoor heat exchanger 13. Thus, the drainage fluid can be efficiently discharged from the long holes 63 to the exterior. Furthermore, through the long holes 63, the drainage fluid is not discharged to the exterior via a drainage tube or the like but the drainage fluid can be "directly" discharged to the exterior. Thus, the drainage fluid dropped from the fins of the outdoor heat exchanger 13 is not frozen again on an inner surface of the bottom plate 30 or in the drainage tube before being discharged to the exterior.

[0042] In the present embodiment, one pair of large expanded portions 60b is arranged closely to each other in each of three corner portions among four corner portions of the bottom plate 30 (in the example shown in FIG. 6, the left upper corner portion, the right upper corner portion, and the right lower corner portion). Thereby, strength of the three corner portions can be improved.

[0043] The expanded portions 60 can increase strength against a load in comparison to a case where no expanded portions are formed. Thus, an area of the

long holes 63 formed in the expanded portions 60 can be increased. Thereby, the drainage fluid from the outdoor heat exchanger 13 can be efficiently discharged to the exterior.

[0044] As shown in FIG. 6, the long holes 63 in the present embodiment are formed on flat upper surfaces 64 of the expanded portions 60 at positions close to the outer side of the bottom plate 30. In the outdoor unit 2 according to the present embodiment, the external air suctioned from the outer side of the outdoor heat exchanger 13 toward the interior is discharged from the grilles 36 arranged in the top plate 31 to the exterior by the fans 23 arranged in an upper part of the device. Therefore, frost is more often attached to outside parts of the fins of the outdoor heat exchanger 13, the outside parts being placed on the windward side of the external air than inside parts. Thus, by forming the long holes 63 at the positions close to the outer side (positions close to the windward side), the drainage fluid generated at the time of defrosting can be efficiently collected and discharged to the exterior.

[0045] In the present embodiment, circular holes 65 (second drainage holes) serving as supplementary discharge holes are formed between the expanded portion 60 and the expanded portion 60 adjacent to each other, and before the first expanded portion 60-f and after the last expanded portion 60-e among the series of expanded portions 60 arranged in a line form. In other words, the circular holes 65 are formed on both sides of the expanded portion 60 with respect to the longitudinal direction of the expanded portion 60.

[0046] The circular holes 65 are formed in a bottom portion 66a of a groove 66 formed in the peripheral edge portion of the bottom plate 30 so as to be along an outer shape of the bottom plate 30 and under the outdoor heat exchanger 13. As shown in FIG. 7, the groove 66 has inclined surfaces 66b on both sides of the bottom portion 66a. An inclination angle of the inclined surfaces 66b can be appropriately selected in consideration with a drainage property or the like. The circular holes 65 are also open to the external air. Thus, the drainage fluid dropped from the outdoor heat exchanger 13 and arrived at the circular holes 65 via the inclined surfaces 66b is directly discharged from the circular holes 65 to the exterior. The bottom portion 66a of the groove 66 in which the circular holes 65 are formed has smaller strength than that of the expanded portions 60. Thus, an opening area of the circular holes cannot be large unlike the long holes 63, and the area is about one third to one fifth of the area of the long holes 63.

[0047] Through the circular holes 65, a drainage fluid not discharged from the long holes 63 to the exterior but flowing into the groove 66 of the drainage fluid dropped from the fins of the outdoor heat exchanger 13 is discharged to the exterior. At the time, as shown in FIG. 7, burring processing is performed to each of the circular holes 65 in the present embodiment in such a manner that a flange portion 67 protrudes on the exterior side.

Therefore, the drainage fluid does not remain in a peripheral edge on the inner side (interior side) of the circular hole 65 by surface tension but the drainage fluid can smoothly flow to the exterior.

[OTHER MODIFIED EXAMPLES]

[0048] It should be noted that the present invention is not limited to the above embodiment but can be variously changed within the scope described in the claims. For example, the first drainage holes are long holes and the second drainage holes are circular holes in the above embodiment. However, as long as the drainage fluid can be discharged, a shape of the drainage holes is not particularly limited. For example, the first drainage holes can be circular holes and the second drainage holes can be long holes. Further the holes can also be formed, for example in a polygonal shape other than the long holes and the circular holes.

[0049] Although a shape of the expanded portions on which the outdoor heat exchanger is mounted is a long circle shape in the above embodiment, the shape may be other shapes such as a rectangular shape.

[0050] The outdoor heat exchanger is arranged so as to substantially face the four side plates of the casing in the above embodiment. The present invention is not limited to this but the present invention can also be applied to an outdoor unit of a type in which an outdoor heat exchanger is arranged so as to face only one side plate, two side plates, or three side plates of a casing. In these cases, an effect of increasing the opening area for discharging the drainage fluid under the heat exchanger while ensuring strength of the bottom plate can be exerted.

REFERENCE SIGNS LIST

[0051]

1: AIR CONDITIONING DEVICE
 2: OUTDOOR UNIT
 3: INDOOR UNIT
 10: REFRIGERANT CIRCUIT
 11: COMPRESSOR
 13: OUTDOOR HEAT EXCHANGER
 22: CASING
 30: BOTTOM PLATE
 31: TOP PLATE
 32: SUPPORT PILLAR
 33a to 33d: LATERAL MEMBER
 35: VENTILATING HOLE
 36: GRILLE
 60: EXPANDED PORTION
 61: CONVEX PORTION
 62: BAND SHAPE RECESSED PORTION
 63: LONG HOLE (FIRST DRAINAGE HOLE)
 65: CIRCULAR HOLE (SECOND DRAINAGE HOLE)

66: GROOVE
 66a: BOTTOM PORTION
 67: FLANGE PORTION

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Claims

1. An outdoor unit (2) of an air conditioning device (1) in which a heat exchanger (13) is arranged in a bottom plate (30) in a substantially rectangular parallelepiped shape casing (22) including a top plate (31), side plates (44, 54, 55), and the bottom plate (30), wherein the heat exchanger (13) is mounted on a plurality of expanded portions (60) formed in the bottom plate (30), a first drainage hole (63) through which a drainage fluid from the heat exchanger (13) is discharged to an exterior is formed in each of the expanded portions (60), and a second drainage hole (65) smaller than the first drainage hole (63) is formed in the bottom plate (30) under the heat exchanger (13) excluding the expanded portions (60).
2. The outdoor unit (2) of the air conditioning device (1) according to claim 1, wherein the second drainage hole (65) is formed between the adjacent expanded portions (60).
3. The outdoor unit (2) of the air conditioning device (1) according to claim 1 or 2, wherein the first drainage hole (63) is formed at a position close to the windward side of an airflow passing through the heat exchanger (13) in the expanded portion (60).
4. The outdoor unit (2) of the air conditioning device (1) according to any of claims 1 to 3, wherein the expanded portions (60) are formed in a long circle shape and arranged at predetermined intervals along a planar shape of the heat exchanger (13).
5. The outdoor unit (2) of the air conditioning device (1) according to claim 4, wherein the first drainage hole (63) is a long hole, and is formed in each of the expanded portions (60) in such a manner that a long axis of the long hole is along the longitudinal direction of the expanded portion (60).

FIG. 1

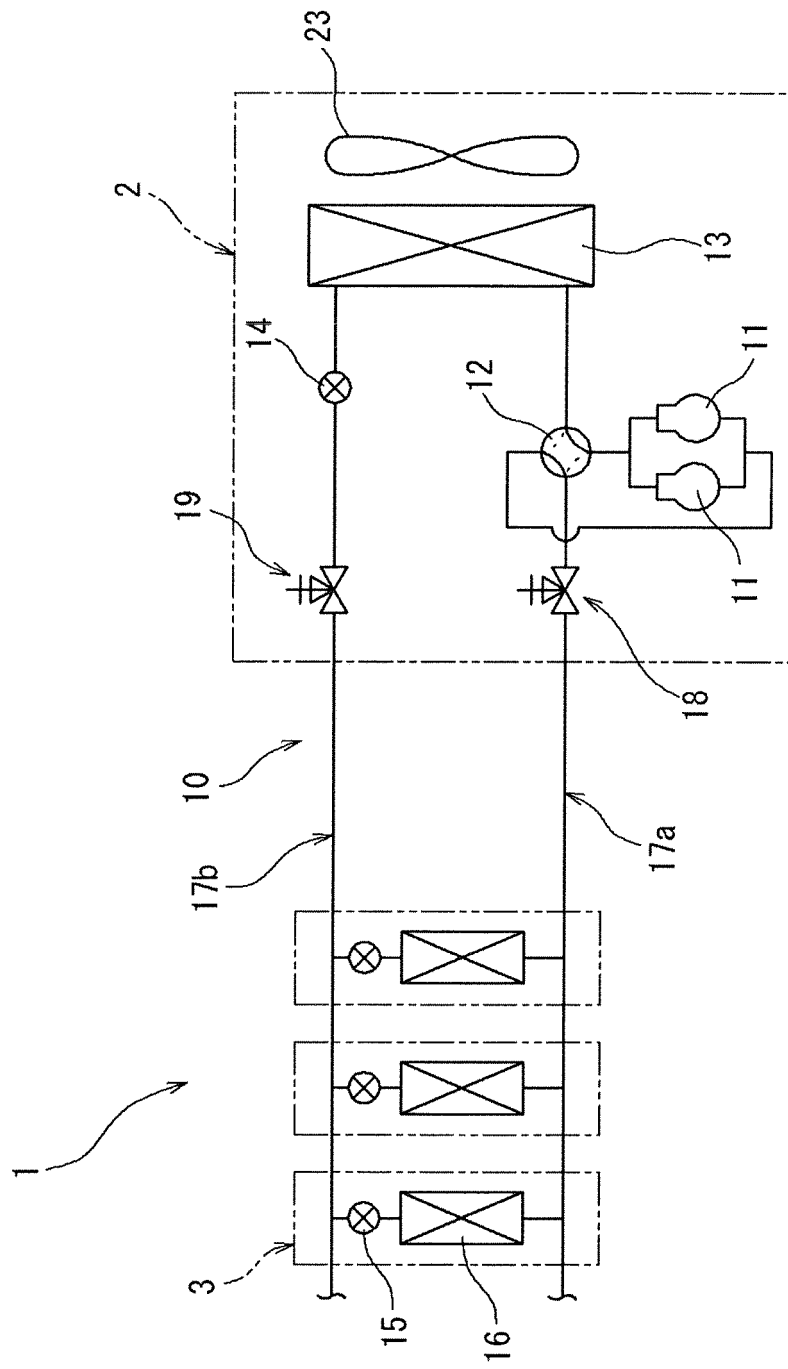


FIG. 2

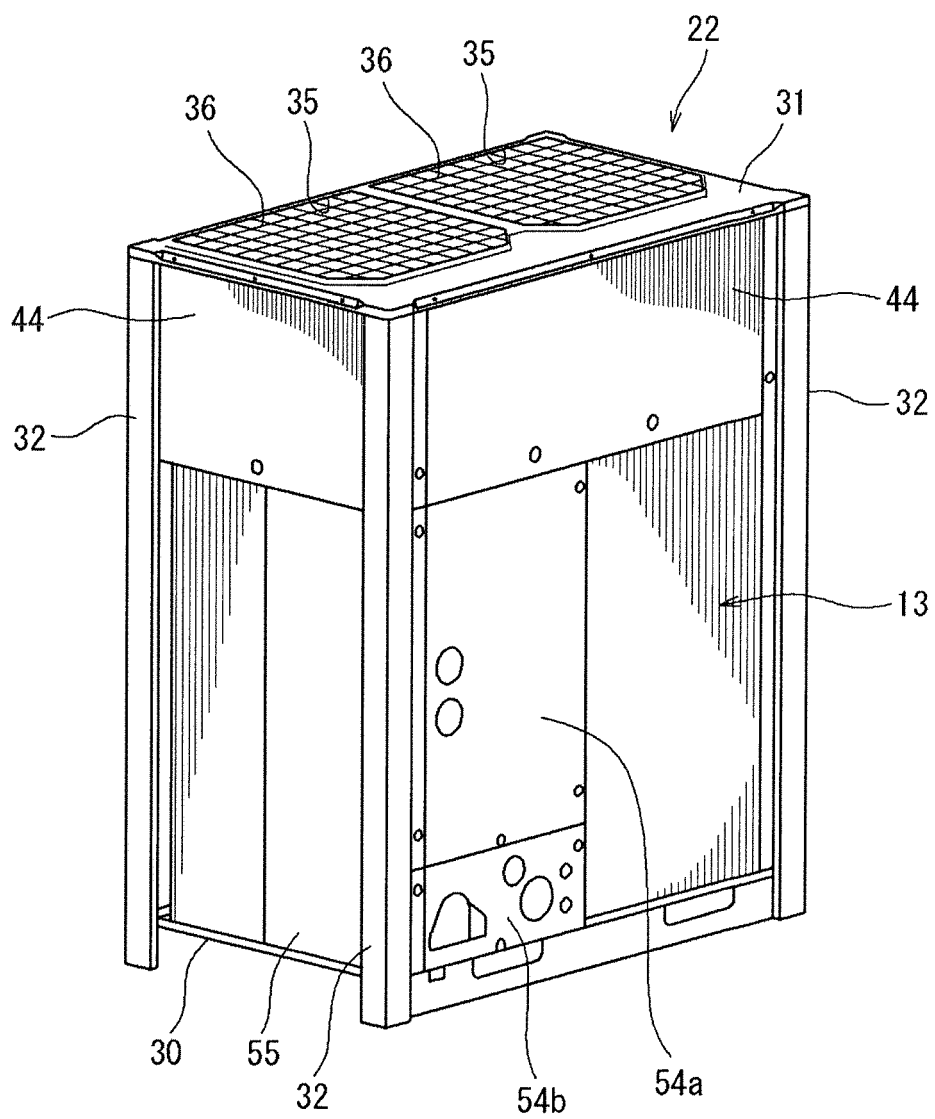


FIG. 3

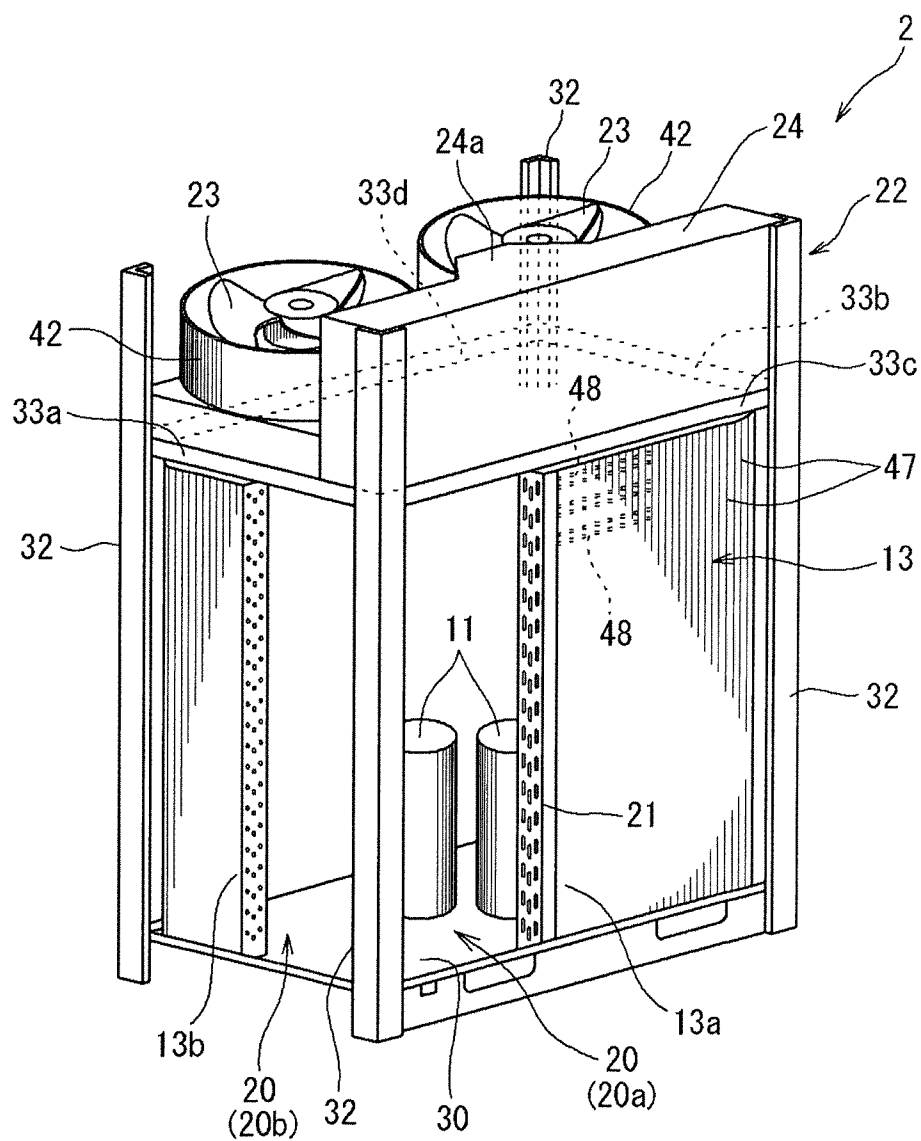


FIG. 4

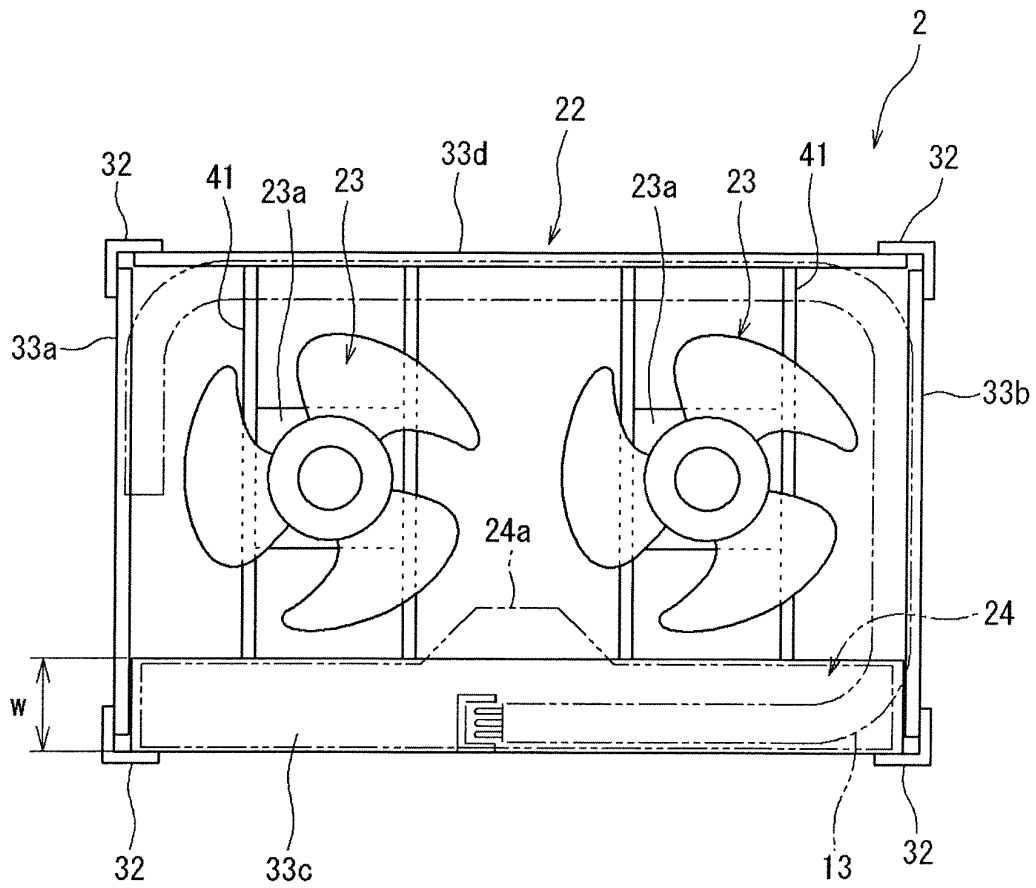


FIG. 5

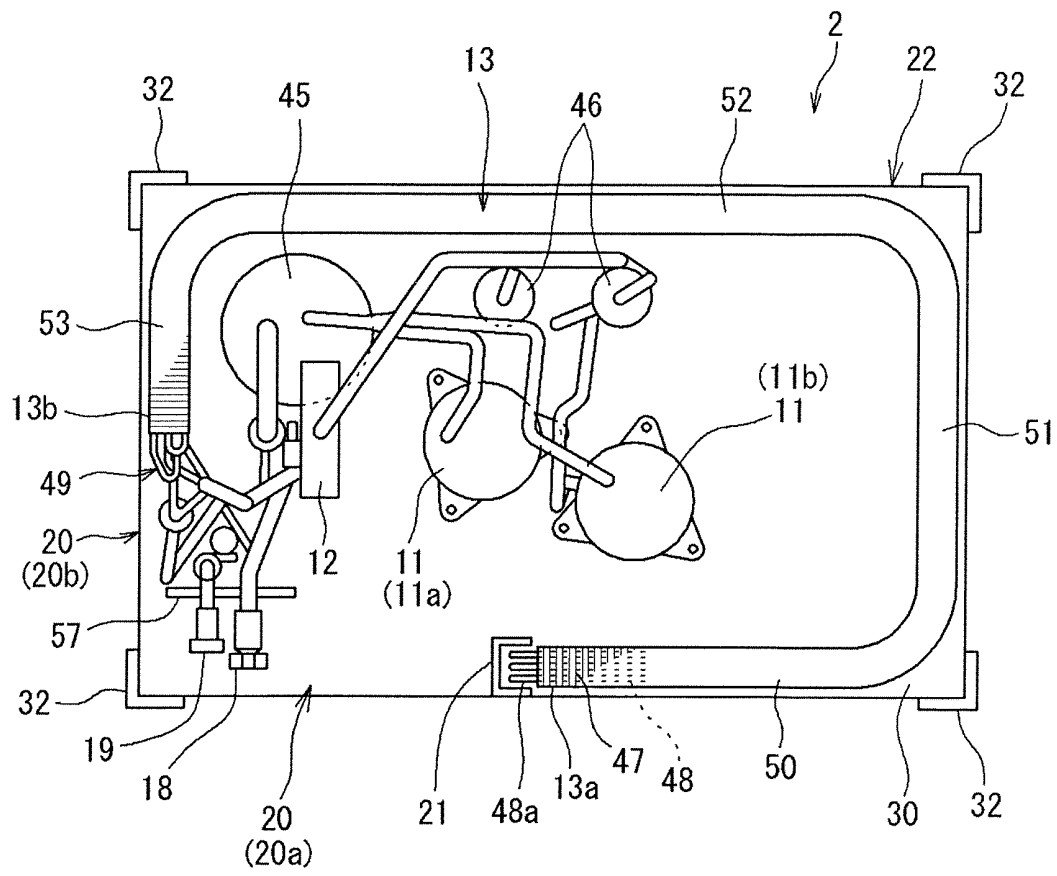


FIG. 6

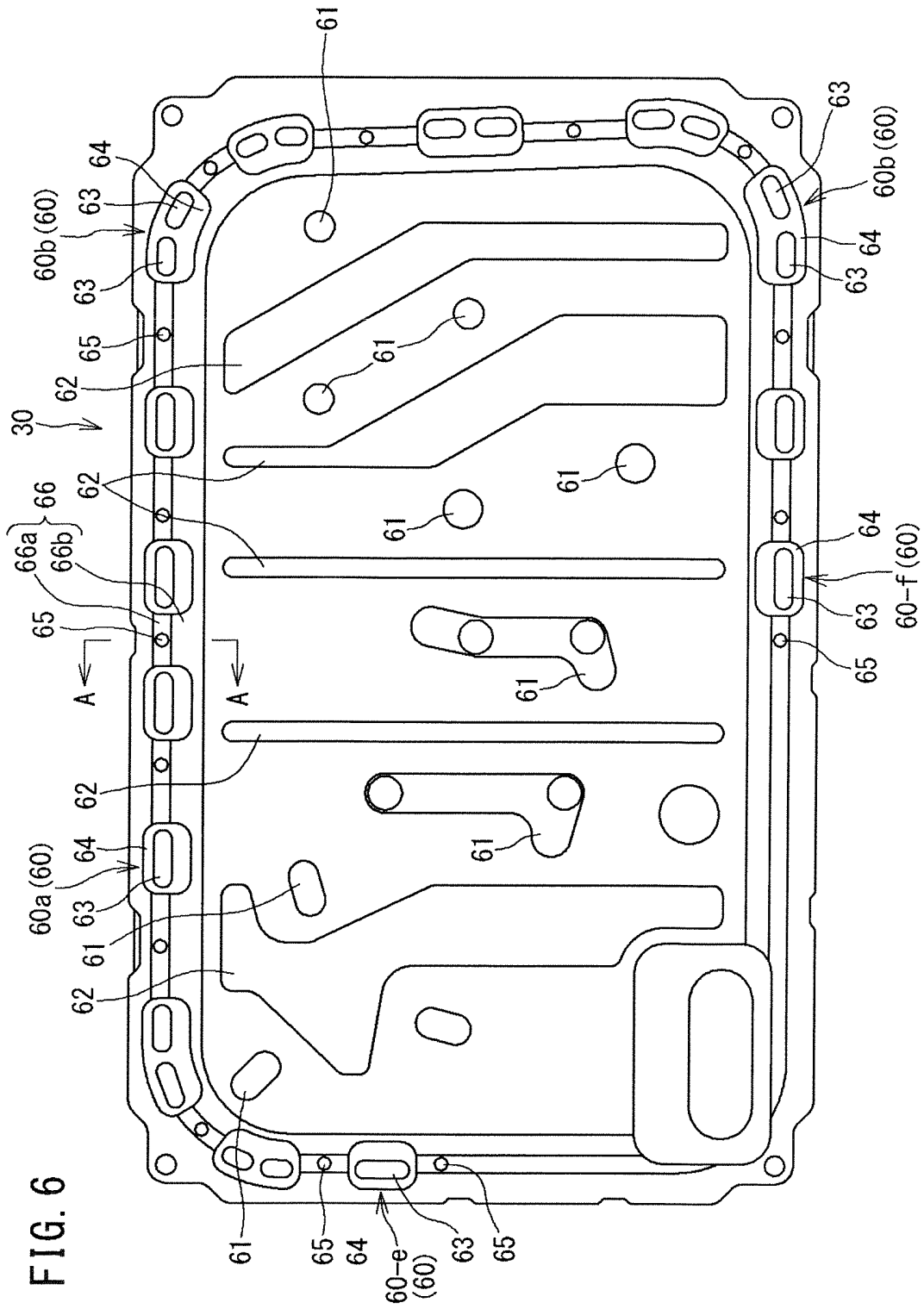
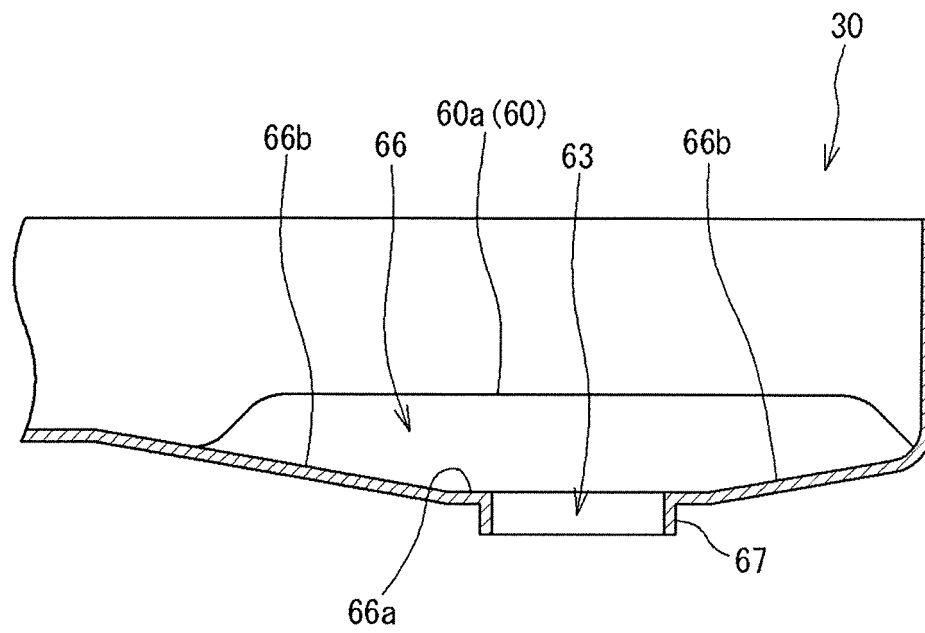


FIG. 7



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2012/079085

A. CLASSIFICATION OF SUBJECT MATTER

F24F1/36(2011.01)i, F24F1/16(2011.01)i, F24F1/56(2011.01)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)

F24F1/36, F24F1/16, F24F1/56

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

Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2013

Kokai Jitsuyo Shinan Koho 1971-2013 Toroku Jitsuyo Shinan Koho 1994-2013

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 164808/1986 (Laid-open No. 69926/1988) (Mitsubishi Heavy Industries, Ltd.), 11 May 1988 (11.05.1988), column 4, line 7 to column 6, line 14; fig. 1, 2 (Family: none)	1, 2, 5 3, 4
Y A	JP 63-111337 A (Sanyo Electric Co., Ltd.), 16 May 1988 (16.05.1988), page 2, lower left column, line 20 to lower right column, line 20; fig. 1, 5 (Family: none)	1, 2, 5 3, 4



Further documents are listed in the continuation of Box C.



See patent family annex.

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Date of the actual completion of the international search
10 January, 2013 (10.01.13)Date of mailing of the international search report
22 January, 2013 (22.01.13)Name and mailing address of the ISA/
Japanese Patent Office

Authorized officer

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Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2012/079085

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 10-300131 A (Toshiba Corp.), 13 November 1998 (13.11.1998), paragraphs [0018], [0019]; fig. 1 to 4 (Family: none)	1, 2, 5
A	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 124982/1987 (Laid-open No. 31930/1989) (Mitsubishi Electric Corp.), 28 February 1989 (28.02.1989), column 5, line 18 to column 8, line 7; fig. 1 to 4 (Family: none)	1
A	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 3152/1985 (Laid-open No. 119029/1986) (Daikin Industries, Ltd.), 26 July 1986 (26.07.1986), column 3, line 17 to column 4, line 12; fig. 1, 2 (Family: none)	1

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 10300131 A [0004]
- JP 2010071531 A [0004]