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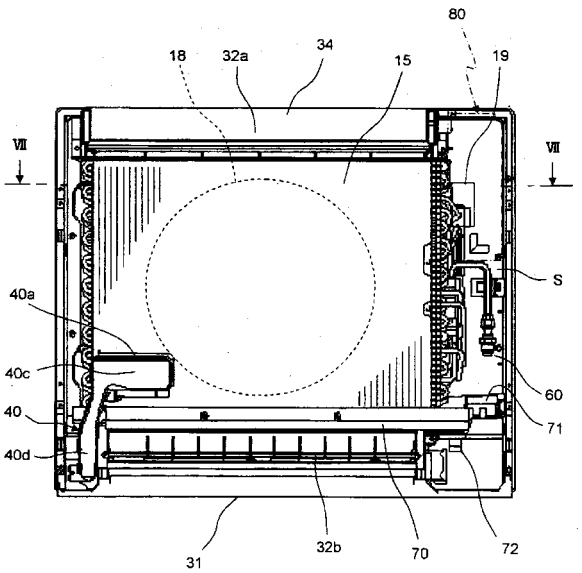
(54) INDOOR UNIT OF AIR CONDITIONING APPARATUS

(57) An indoor unit for floor type or wall-embedded type air conditioners having reheat and dehumidification function includes a body casing, a generally planar-shaped indoor heat exchanger 15 placed within the body casing, and an air flow passage provided on a rear face side of the indoor heat exchanger 15 within the body casing. A pipe connecting portion 60 is placed within the side chamber S provided within the body casing and beside the indoor heat exchanger 15 and the air flow passage. Further, a solenoid valve 19 for reheat and dehumidification is placed within the side chamber S and near an electrical part box 80.

Fig.6



EP 2 141 425 A1

Description

TECHNICAL FIELD

[0001] The present invention relates to an indoor unit for air conditioners and, more particularly, to an indoor unit for floor type or wall-embedded type air conditioners having a reheat and dehumidification function.

BACKGROUND ART

[0002] As an indoor unit for air conditioners, there has conventionally been provided an indoor unit for floor type air conditioners which is to be installed so that its rear face side comes into contact with an indoor wall (see, e.g., JP H11-230565 A).

[0003] In such an indoor unit of air conditioners, with a view to providing a reheat and dehumidification function for exerting dehumidification without excessively lowering an indoor temperature, an indoor heat exchanger is divided into two heat exchanger sections, with a solenoid valve placed between the heat exchanger sections, in which one heat exchanger section works as an evaporator and the other heat exchanger section serves as a condenser to perform reheat and dehumidification operation.

[0004] In this indoor unit for floor type air conditioners having the reheat and dehumidification function, if the solenoid valve is placed in a limited space containing a pipe connecting portion for connection of interconnecting lines from outdoors and an electrical part box, the work space for piping connection becomes narrow, resulting in a problem of degraded workability during the construction.

SUMMARY OF INVENTION

Technical Problem

[0005] Accordingly, an object of the present invention is to provide an indoor unit for floor type or wall-embedded type air conditioners which allows a body casing space to be effectively utilized to ensure a work space so that the workability of pipe connection during the installation can be improved.

Solution to Problem

[0006] In order to achieve the above object, there is provided an indoor unit for floor type or wall-embedded type air conditioners, comprising:

a body casing;
a generally planar-shaped heat exchanger placed within the body casing;
an air flow passage provided on a rear face side of the heat exchanger within the body casing;
a side chamber within the body casing and beside the heat exchanger and the air flow passage;
a pipe connecting portion placed within the side chamber;
an electrical part box placed within the side chamber; and
a valve placed within the side chamber and near the electrical part box.

[0007] According to this invention, a side chamber is provided within the body casing and beside the generally planar-shaped heat exchanger and the air flow passage provided on the rear face side of the heat exchanger, the side chamber being isolated away from the air flow passage, and an electrical part box is placed within the side chamber and moreover a valve is placed within the side chamber and near the electrical part box. As a result, the solenoid valve near the electrical part box placed commonly on the upper side of the pipe connecting portion does not make obstruction to the work of pipe connection. Thus, it becomes possible to shorten the harness from the coil of the valve while ensuring the work space for pipe connection for connection of the interconnecting lines from outside, so that the work time for assembly or the like can be shortened by simplified routing of the harness. Accordingly, in floor type or wall-embedded type air conditioners, the work space can be ensured by effectively utilizing spaces in the body casing, so that the workability of pipe connection in the installation can be improved.

[0008] In one embodiment of the invention, the indoor unit further comprising
a drain receiver part provided on a lower side of the side chamber within the body casing, wherein
the valve is positioned upward of the drain receiver part.

[0009] According to this embodiment, since the valve is positioned upward of the drain receiver part provided on a lower side of the side chamber within the body casing, condensed water deposited on the valve, if dripped, can be received by the drain receiver part.

[0010] In one embodiment of the invention, at least heat-uninsulated portions of pipes connected to the heat exchanger and the pipe connecting portion are positioned upward of the drain receiver part.

[0011] According to this embodiment, since at least heat-uninsulated portions of pipes connected to the heat exchanger and the pipe connecting portion are positioned upward of the drain receiver part, condensed water deposited on such a heat exchanger and the pipe connecting portion, if dripped, can be received by the drain receiver part.

[0012] In one embodiment of the invention, the valve is a solenoid valve or an electrically-operated expansion valve.

[0013] According to this embodiment, the interconnecting distance between the coil of the solenoid valve (or electrically-operated expansion valve) to be used for the valve and the electrical part box can be shortened, so that the work time for assembly or the like can be

shortened by simplified routing of the interconnecting lines.

[0014] In one embodiment of the invention, the solenoid valve or the electrically-operated expansion valve is dedicated to reheat and dehumidification use.

[0015] According to this embodiment, with a solenoid valve for reheat and dehumidification or an electrically-operated expansion valve for reheat and dehumidification used as the valve, it becomes possible to easily switch from ordinary cooling operation or heating operation to reheat and dehumidification operation by opening and closing the solenoid valve or the electrically-operated expansion valve. Further, the interconnecting distance between the coil of the solenoid valve for reheat and dehumidification (or electrically-operated expansion valve for reheat and dehumidification) and the electrical part box can be shortened, so that the work time for assembly or the like can be shortened by simplified routing of the interconnecting lines. It is noted here that with a solenoid valve for reheat and dehumidification used as the valve, the solenoid valve may be one which is fully closed by closing operation with capillaries connected in parallel, or another which has throttling function by closing operation.

[0016] In one embodiment of the invention, the electrical part box is attached so as to be removable forward from within the side chamber of the body casing.

[0017] According to this embodiment, repair and replacement or the like of the valve placed within the side chamber and near the electrical part box can be easily carried out with the electrical part box removed forward from within the side chamber of the body casing, so that the maintainability is improved.

Advantageous Effects of Invention

[0018] As apparent from the above description, according to the indoor unit for air conditioners of the invention, there can be provided an indoor unit for floor type or wall-embedded type air conditioners having the reheat and dehumidification function and capable of ensuring the work space by effectively utilizing spaces in the body casing so that the workability of pipe connection in the installation can be improved.

[0019] According to this embodiment, since the valve is positioned upward of the drain receiver part provided on a lower side of the side chamber within the body casing, condensed water deposited on the valve, if dripped, can be received by the drain receiver part.

[0020] According to this embodiment, since at least heat-uninsulated portions of pipes connected to the heat exchanger and the pipe connecting portion are positioned upward of the drain receiver part, condensed water deposited on such a heat exchanger and the pipe connecting portion, if dripped, can be received by the drain receiver part.

[0021] According to this embodiment, the interconnecting distance between the coil of the solenoid valve (or electrically-operated expansion valve) to be used for the valve and the electrical part box can be shortened, so that the work time for assembly or the like can be shortened by simplified routing of the interconnecting lines.

[0022] According to this embodiment, it becomes possible to easily switch from ordinary cooling operation or heating operation to reheat and dehumidification operation by opening and closing the solenoid valve.

[0023] Also, according to the indoor unit for air conditioners in one embodiment, since the electrical part box is attached so as to be removable forward from within the side chamber of the body casing, repair and replacement or the like of the valve placed within the side chamber and near the electrical part box can be easily carried out with the electrical part box removed forward, so that the maintainability is improved.

BRIEF DESCRIPTION OF DRAWINGS

[0024]

Fig. 1 is a circuit diagram of a refrigerant circuit for an indoor unit and an outdoor unit of an air conditioner according to one embodiment of the present invention;

Fig. 2 is a perspective view of the indoor unit for air conditioners;

Fig. 3 is a side view of the indoor unit installed as a floor type one;

Fig. 4 is a side view showing the indoor unit with an upper-side cover and a left-side cover removed;

Fig. 5 is a side view of the indoor unit which is applied as a wall-embedded type one of the air conditioner;

Fig. 6 is a front view showing a state that an intake panel and a front grille are removed from the indoor unit;

Fig. 7 is a sectional view taken along the line VII - VII of Fig. 6;

Fig. 8 is an enlarged view of an upper right portion of the indoor unit shown in Fig. 6 with the electrical part box attached;

Fig. 9 is a side view of the upper right portion of the indoor unit as viewed sideways from the right;

Fig. 10 is an enlarged view of an upper right portion of the indoor unit shown in Fig. 6 with the electrical part box removed; and

Fig. 11 is a view of Fig. 10 as viewed from the rear face side.

DESCRIPTION OF EMBODIMENTS

[0025] Hereinbelow, an indoor unit for air conditioners according to the present invention will be described in detail by way of embodiments thereof illustrated in the accompanying drawings.

[0026] Fig. 1 shows a circuit diagram of a refrigerant circuit of an indoor unit 2 for air conditioners according

to an embodiment of the invention and an outdoor unit 1 connected to the indoor unit 2 via interconnecting lines L1, L2. This air conditioner, as shown in Fig. 1, includes a compressor 11, a four-way switching valve 12 whose one end is connected to a discharge side of the compressor 11, an outdoor heat exchanger 13 whose one end is connected to the other end of the four-way switching valve 12, an electrically-operated expansion valve 14 whose one end is connected to the other end of the outdoor heat exchanger 13, a first heat exchanger section 15A whose one end is connected to the other end of the electrically-operated expansion valve 14 via a closing valve 21 and the interconnecting line L1, a solenoid valve 19 for reheat and dehumidification as an example of a valve whose one end is connected to the other end of the first heat exchanger section 15A, a second heat exchanger section 15B whose one end is connected to the other end of the solenoid valve 19, and an accumulator 16 whose one end is connected to the other end of the second heat exchanger section 15B via the interconnecting line L2, a closing valve 22 and the four-way switching valve 12 and whose other end is connected to an intake side of the compressor 11. The first heat exchanger section 15A and the second heat exchanger section 15B constitute an indoor heat exchanger 15 (shown in Figs. 3, 6 and 7) .

[0027] The compressor 11, the four-way switching valve 12, the outdoor heat exchanger 13, the electrically-operated expansion valve 14, the indoor heat exchanger 15, the solenoid valve 19 and the accumulator 16 constitute the refrigerant circuit. The compressor 11, the four-way switching valve 12, the outdoor heat exchanger 13, the electrically-operated expansion valve 14, the accumulator 16, an outdoor fan 17 and a humidifying unit 42 constitute the outdoor unit 1, while the first heat exchanger section 15A, the second heat exchanger section 15B, an indoor fan 18, the solenoid valve 19 and a duct part 40 constitute the indoor unit 2.

[0028] Also, in this air conditioner, the duct part 40 for supplying outdoor humidified air into an room interior is provided in the indoor unit 2, and a humidifying unit 42 connected to a hose connecting portion 40b of the duct part 40 via a humidifying hose 41 is provided in the outdoor unit 1.

[0029] In the air conditioner having the construction described above, for heating operation, as the compressor 11 is started up by changing over the four-way switching valve 12 to a switching position of solid line with the solenoid valve 19 opened, a high-pressure refrigerant discharged from the compressor 11 passes through the four-way switching valve 12 to enter into the second heat exchanger section 15B and the first heat exchanger section 15A. Then, the refrigerant condensed by the first, second heat exchanger sections 15A, 15B, after reduced in pressure by the electrically-operated expansion valve 14, enters into the outdoor heat exchanger 13. The refrigerant evaporated by the outdoor heat exchanger 13 returns to the intake side of the compressor 11 via the four-way switching valve 12 and the accumulator 16. In this way, the refrigerant circulates through the refrigerant circuit constituted by the compressor 11, the first heat exchanger section 15A, the solenoid valve 19, the second heat exchanger section 15B, the electrically-operated expansion valve 14, the outdoor heat exchanger 13 and the accumulator 16 to execute a refrigerating cycle. Then, indoor air is circulated via the first, second heat exchanger sections 15A, 15B by the indoor fan 18, by which indoor heating is fulfilled.

[0030] In contrast to this, for cooling operation, with the solenoid valve 19 opened, the four-way switching valve 12 is switched to a switching position of broken line to execute a refrigerating cycle that the refrigerant is circulated through the compressor 11, the outdoor heat exchanger 13, the electrically-operated expansion valve 14, the first heat exchanger section 15A, the solenoid valve 19, the second heat exchanger section 15B and the accumulator 16, in this order.

[0031] When indoor dryness is involved in heating operation or the like, humidified air is supplied indoors from the humidifying unit 42 via the humidifying hose 41 and the duct part 40. The humidifying unit 42 adsorbs moisture from outdoor air by using an adsorbent such as zeolite, humidifies the outdoor air by moisture adsorbed to the adsorbent, and thereafter supplies the humidified outdoor air to the indoor unit 2. It is noted that the humidifying unit is not limited to this construction and, for example, a humidifying unit which supplies the humidified air to the indoor unit by using water resupplied from tap water or other water supply means may also be used instead.

[0032] Then, in the reheat and dehumidification operation for executing comfortable dehumidification without excessively lowering the indoor temperature, the electrically-operated expansion valve 14 is opened while the solenoid valve 19 is closed into a restricted state. Further, the four-way switching valve 12 is switched to the position of solid line so that the compressor 11 is started up, and then the outdoor heat exchanger 13 and the first heat exchanger section 15A work as a condenser while the second heat exchanger section 15B works as an evaporator. As a result of this, while indoor air is heated by the first heat exchanger section 15A, dehumidification and cooling are carried out by the second heat exchanger section 15B so that dehumidification is fulfilled without lowering the indoor temperature.

[0033] Fig. 2 shows a perspective view of the floor type indoor unit 2 for air conditioners. This indoor unit 2, as shown in Fig. 2, includes a generally rectangular-shaped bottom frame 31 whose rear face side is attached to an indoor wall surface, a front grille 32 attached to a front face side of the bottom frame 31 and having a generally rectangular-shaped opening (not shown) in its front face, and an intake panel 33 attached so as to cover the opening of the front grille 32. The bottom frame 31 and the front grille 32 constitute a body casing.

[0034] An upper blowoff opening 32a is provided at an upper portion of the front grille 32, and a lower blowoff

opening 32b is provided at a lower portion of the front grille 32. A flap 34 is provided at the upper blowoff opening 32a of the front grille 32. This flap 34 rotates to blow off cool air and warm air forward and obliquely upward from the upper blowoff opening 32a during cooling and heating operations, and covers the upper blowoff opening 32a during halts of operation.

[0035] Further, an upper intake opening 33a is provided on an upper side of the intake panel 33, a lower intake opening 33b is provided on a lower side of the intake panel 33, and side intake openings 33c (only the right side one shown in Fig. 2) is provided on right-and-left side faces of the intake panel 33.

[0036] Moreover, an upper-side cover 35, a left-side cover 36 (shown in Fig. 3) and a right-side cover 37 are removably attached individually in vicinities of the rear end of the front grille 32 of the bottom frame 31. These upper-side cover 35, the left-side cover 36 and the right-side cover 37 have engagement claws (not shown), respectively, which are to be engaged with engaging portions (not shown) provided in the bottom frame 31 so that the upper-side cover 35, the left-side cover 36 and the right-side cover 37 are individually fixed to the bottom frame 31.

[0037] Fig. 3 shows a side view of the indoor unit 2 installed as a floor type one. As shown in Fig. 3, a duct part 40 is placed near the left-side face and on a lower side within a body casing (31, 32). The duct part 40 has, at one end, an indoor-side opening 40a as an example of an air supply port for supplying humidified outdoor air into the room interior, the indoor-side opening 40a positioned between the intake panel 33 and the indoor heat exchanger 15, and also has, at the other end, a hose connecting portion 40b to which one end of a humidifying hose as an outdoor-communicating air passage is connected, the hose connecting portion 40b positioned near the left side face and on a lower side within the bottom frame 31. In Fig. 3, the upper-side cover 35, the left-side cover 36 and the right-side cover 37 (shown in Fig. 2) are attached to the bottom frame 31.

[0038] This indoor unit 2 is laid on floor so that its back face side is in contact with the wall surface. The humidifying hose 41 is connected to the indoor unit 2 together with the interconnecting lines L1, L2 (shown in Fig. 1) from the wall surface side.

[0039] Fig. 4 shows a side view of the indoor unit 2 with the upper-side cover 35 and the left-side cover 36 shown in Fig. 3 removed. In addition, although the upper-side cover 35 is removed in Fig. 4, the upper-side cover 35 does not have to be removed for connecting work when the unit is not a wall-embedded type one.

[0040] For installation of this indoor unit 2, as shown in Fig. 4, the left-side cover 36 removed from the bottom frame 31 is temporarily set at a position away from the wall surface within an operator's hand-accessible range, and the humidifying hose 41 is easily connected to the hose connecting portion 40b under visual check via a visual-check opening 31a. Then, after completion of the connection of the humidifying hose 41 and the interconnecting lines L1, L2 (shown in Fig. 1), the upper-side cover 35 and the left-side cover 36 are attached to the bottom frame 31 again. Next, as shown in Fig. 3, the back face side of the indoor unit 2 is brought into contact with the wall surface, and fixed to a wall 30 by using screws or the like.

[0041] In addition, in this indoor unit 2, while the upper-side cover 35, the left-side cover 36 and the right-side cover 37 shown in Figs. 2 and 3 are removed as shown in Fig. 5, part of the bottom frame 31 (a back face side portion deeper than the rear end of the front grille 32) may be embedded into the wall 30 to accomplish the installation.

[0042] Fig. 6 shows a front view showing a state that the intake panel 33 and the front grille 32 are removed from the indoor unit 2. As shown in Fig. 6, a generally planar-shaped indoor heat exchanger 15 is placed on the front side of the bottom frame 31, and an indoor fan 18 is placed on the rear face side thereof. This indoor fan 18 is a turbofan which sucks air in from the front face side and blows off the air radially outward. The duct part 40 is placed near the left side face and on a lower side of the bottom frame 31. This duct part 40 has a body 40c having at an upper end a generally rectangular-shaped indoor-side opening 40a opened obliquely upward on the rear face side, and a bent portion 40d extending downward from a lower end of the body 40c and bent toward the rear face side. A hose connecting portion 40b (shown in Figs. 3 and 4) is provided at a lower end of the bent portion 40d of the duct part 40. An upper blowoff opening 32a is provided on an upper side of the bottom frame 31, while a lower blowoff opening 32b is provided on a lower side of the bottom frame 31.

[0043] Also as shown in Fig. 6, a pipe connecting portion 60 to which the interconnecting lines L1, L2 are connected is provided at a side chamber S near the right side face of the bottom frame 31. The interconnecting lines L1, L2 together with the humidifying hose 41 (shown in Figs. 3 to 5) enter from the back face side to near the left side face and the lower side of the bottom frame 31, being led from left toward right on the lower side within the bottom frame 31 so as to be connected to the pipe connecting portion 60.

[0044] In this case, when the interconnecting lines L1, L2 (shown in Fig. 1) are brought into the bottom frame 31 from the left side so as to be connected to the pipe connecting portion 60 on the left side face of the bottom frame 31, removing a trapezoidal-shaped plate member 31b formed integrally with the bottom frame 31 on the rear face side of the visual-check opening 31a of the bottom frame 31 shown in Fig. 4 causes a hole for insertion of the interconnecting lines L1, L2 from the left side into the bottom frame 31 to be formed by a space from which the plate member 31b has been removed and the visual-check opening 31a. A groove is formed on the outer periphery of the plate member 31b except its visual-check opening 31a side to provide a thin thickness, making it

easier to remove the plate member 31b. Numerals 70, 71 and 72 denote, respectively, a drain pan, a drain receiving portion and a drain hole.

[0045] As shown above, since part of the hole for connecting the interconnecting lines L1, L2 from the left side to the pipe connecting portion 60 is shared by the visual-check opening 31a, it becomes no longer necessary to additionally provide a visual-check opening in the body casing, so that the body casing structure can be simplified and a cost reduction can be achieved.

[0046] Fig. 7 shows a sectional view taken along the line VII - VII of Fig. 6. As shown in Fig. 7, an air flow passage 20 as well as an indoor fan 18 are provided on the rear face side of the indoor heat exchanger 15 within the bottom frame 31. A side chamber S is provided in the bottom frame 31 and beside the indoor heat exchanger 15 and the air flow passage 20 so as to be apart from the air flow passage 20, and the pipe connecting portion 60 is placed in the side chamber S. Further, an electrical part box 80
(shown in Fig. 8) is placed on the upper side within the side chamber S, and a solenoid valve 19 is placed in the side chamber S and near the electrical part box 80. The electrical part box 80 is attached to the bottom frame 31 so as to be removable by being pulled out forward from within the side chamber S of the bottom frame 31. In Fig. 6, the solenoid valve 19 is shown with the electrical part box 80 absent. A coil of the solenoid valve 19 is connected to the electrical part box 80 via harness.

[0047] Fig. 8 shows an enlarged view of an upper right portion of the indoor unit 2 shown in Fig. 6 with the electrical part box 80 attached, where the solenoid valve 19 shown in Fig. 7 is invisibly hidden behind the electrical part box 80. Also, a terminal block 90 for connecting a power line or the like is provided on the front face side of the electrical part box 80, and the coil of the solenoid valve 19 is present near and intermediately behind the terminal block 90.

[0048] Fig. 9 shows a side view of the upper right portion of the indoor unit 2 as viewed from the right side, where the solenoid valve 19 shown in Fig. 7 is placed on a laterally-sided rear side of the electrical part box 80.

[0049] Fig. 10 shows an enlarged view of the upper right portion of the indoor unit 2 shown in Fig. 6 except the electrical part box. Fig. 11 shows a view of Fig. 10 as viewed from the rear face side.

[0050] As shown above, in the indoor unit 2 for air conditioners of the floor type and the wall-embedded type including the reheat and dehumidification function, the solenoid valve 19 for reheat and dehumidification is placed within the side chamber S and near the electrical part box 80 on the right side of the body casing (31, 32) in the side chamber, by which the solenoid valve 19 near the electrical part box 80 placed on the side upper than the pipe connecting portion 60 does not make obstruction to the work of pipe connection. Thus, it becomes possible to shorten the harness from the coil of the solenoid valve 19 while ensuring the work space for pipe connection for connection of the interconnecting lines from outside, so that the work time for assembly or the like can be shortened by simplified routing of the harness. Accordingly, the work space can be ensured by effectively utilizing spaces in the body casing (31, 32), so that the workability of pipe connection in the installation can be improved.

[0051] Also, since the solenoid valve 19 is positioned upward of a drain receiver part 71 which is provided on the lower side of the side chamber S provided sideward within the body casing (31, 32), condensed water deposited on the solenoid valve 19, if dripped, can be received by the drain receiver part 71.

[0052] Further, since at least heat-uninsulated portions of the pipes connected to the indoor heat exchanger 15 and the pipe connecting portion 60 are positioned upward of the drain receiver part 71, condensed water deposited on those pipes connected to the indoor heat exchanger 15 and the pipe connecting portion 60, if dripped, can be received by the drain receiver part 71. In this connection, at least heat-uninsulated portions out of the pipes connected to the indoor heat exchanger 15 and the pipe connecting portion 60 refer to, for example, pipes that make connection between the indoor heat exchanger 15 and the solenoid valve 19, pipes that make connection between the indoor heat exchanger 15 and a flow diverter, and the like.

[0053] Also, it becomes possible to easily switch from ordinary cooling operation or heating operation to reheat and dehumidification operation by opening and closing the solenoid valve 19.

[0054] Also, since the electrical part box 80 is attached so as to be removable forward from within the side chamber S of the body casing (31, 32), repair and replacement of the solenoid valve 19 placed within the side chamber and near the electrical part box 80 can be easily carried out with the electrical part box 80 removed forward, so that the maintainability is improved.

[0055] Also, when the left-side cover 36 that can be taken off from the bottom frame 31 is used as a lid member in the installation of the bottom frame 31 with its back face side embedded in the wall, it becomes no longer necessary to prepare any additional member for covering the visual-check opening 31a, so that the cost can be reduced.

[0056] In this embodiment, the indoor unit for wall-embedded type air conditioners is installed by embedding the back face side in a recess portion provided in the wall. However, without being limited to those of which the bottom portion is installed onto the floor, the indoor unit for air conditioners may be one whose back face side is embedded in a recess portion provided away from the wall.

[0057] This embodiment has been described about an indoor unit for air conditioners which is applicable to both floor type and wall-embedded type. However, the present invention may be applied to indoor units for air conditioners which are exclusively dedicated to floor type indoor units for air conditioners or indoor units for air condition-

ers which are exclusively dedicated to wall-embedded type indoor units for air conditioners.

[0058] Also, this embodiment has been described about an indoor unit for air conditioners in which the solenoid valve 19 for reheat and dehumidification is placed within the side chamber S and near the electrical part box 80 on the right side of the body casing (31, 32). However, the side chamber may be provided on the left side of the body casing (31, 32), and the valve may be placed within the side chamber and near the electrical part box.

[0059] Also, this embodiment has been described about an indoor unit for air conditioners in which the hose connecting portion 40b of the duct part 40 is positioned near the left side face and on the lower side within the bottom frame 31. However, the hose connecting portion of the duct part may be positioned on the upper side without being limited to the lower side near the left side face of the body casing, and may also be positioned at an upper or lower position near the right side face of the body casing.

[0060] Further, although the solenoid valve 19 is placed between the first heat exchanger section 15A and the second heat exchanger section 15B in this embodiment, an electrically-operated expansion valve may be placed instead of the solenoid valve.

Claims

1. An indoor unit for floor type or wall-embedded type air conditioners, comprising:

   a body casing (31, 32);
   a generally planar-shaped heat exchanger (15) placed within the body casing (31, 32);
   an air flow passage (20) provided on a rear face side of the heat exchanger (15) within the body casing (31, 32);
   a side chamber within the body casing (31, 32) and beside the heat exchanger (15) and the air flow passage (20);
   a pipe connecting portion (60) placed within the side chamber;
   an electrical part box (80) placed within the side chamber; and
   a valve (19) placed within the side chamber and near the electrical part box (80).

2. The indoor unit for air conditioners as claimed in Claim 1, further comprising
   a drain receiver part (71) provided on a lower side of the side chamber within the body casing (31, 32), wherein
   the valve (19) is positioned upward of the drain receiver part (71).

3. The indoor unit for air conditioners as claimed in Claim 2, wherein
   at least heat-uninsulated portions of pipes connected to the heat exchanger (15) and the pipe connecting portion (60) are positioned upward of the drain receiver part (71).

4. The indoor unit for air conditioners as claimed in any one of Claims 1 to 3, wherein
   the valve (19) is a solenoid valve or an electrically-operated expansion valve.

5. The indoor unit for air conditioners as claimed in Claim 4, wherein
   the solenoid valve or the electrically-operated expansion valve is dedicated to reheat and dehumidification use.

6. The indoor unit for air conditioners as claimed in any one of Claims 1 to 5, wherein
   the electrical part box (80) is attached so as to be removable forward from within the side chamber of the body casing (31, 32).

Fig.1

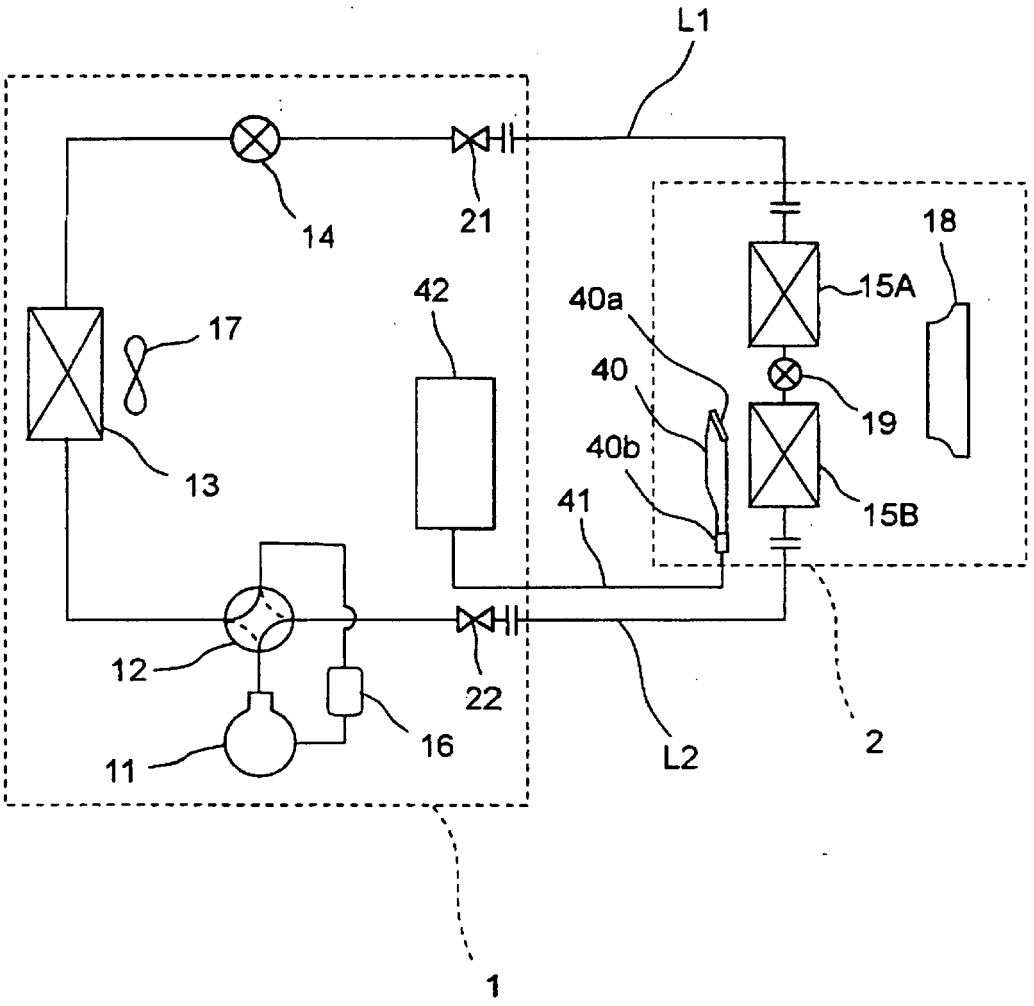


Fig.2

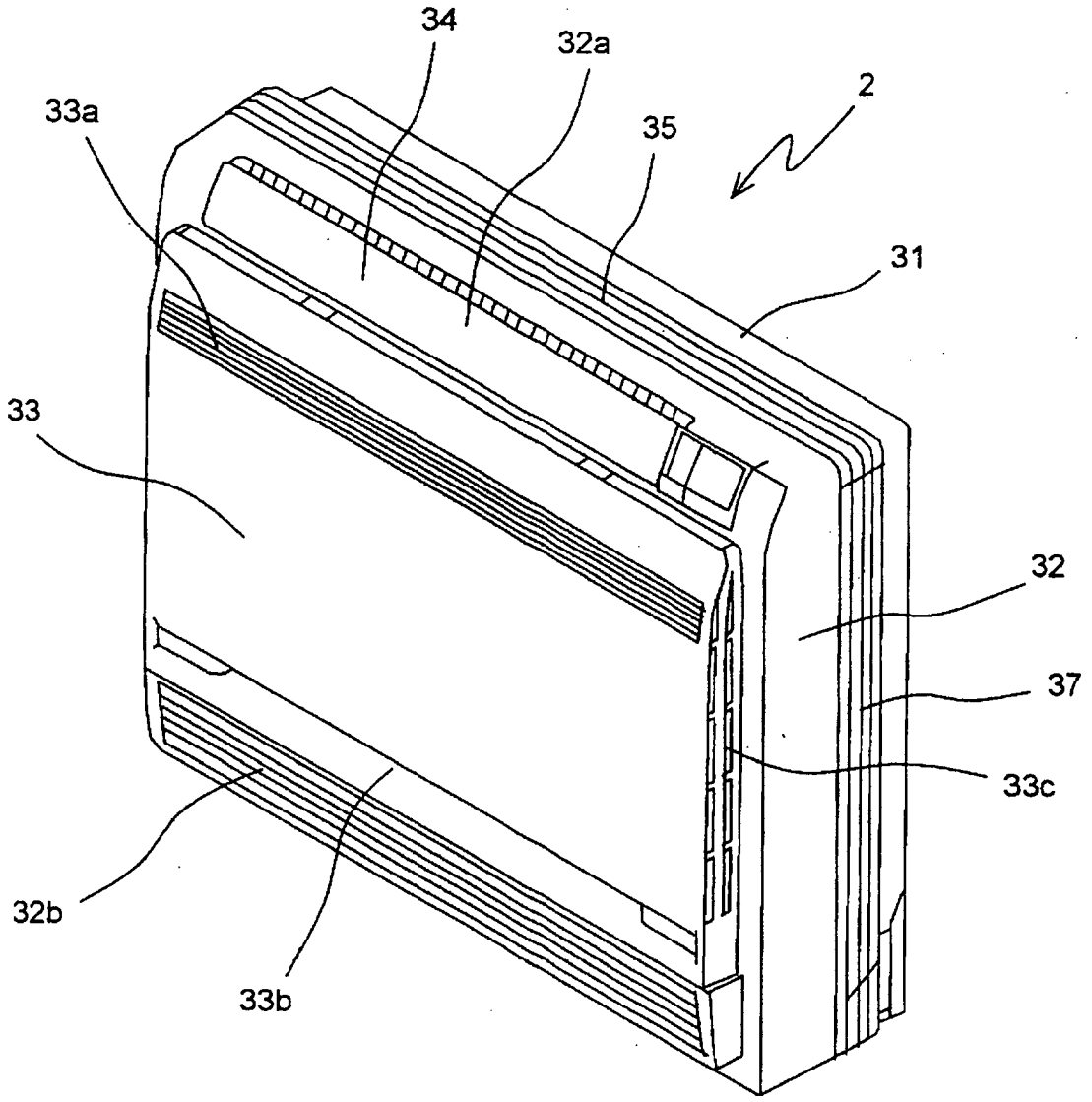


Fig.3

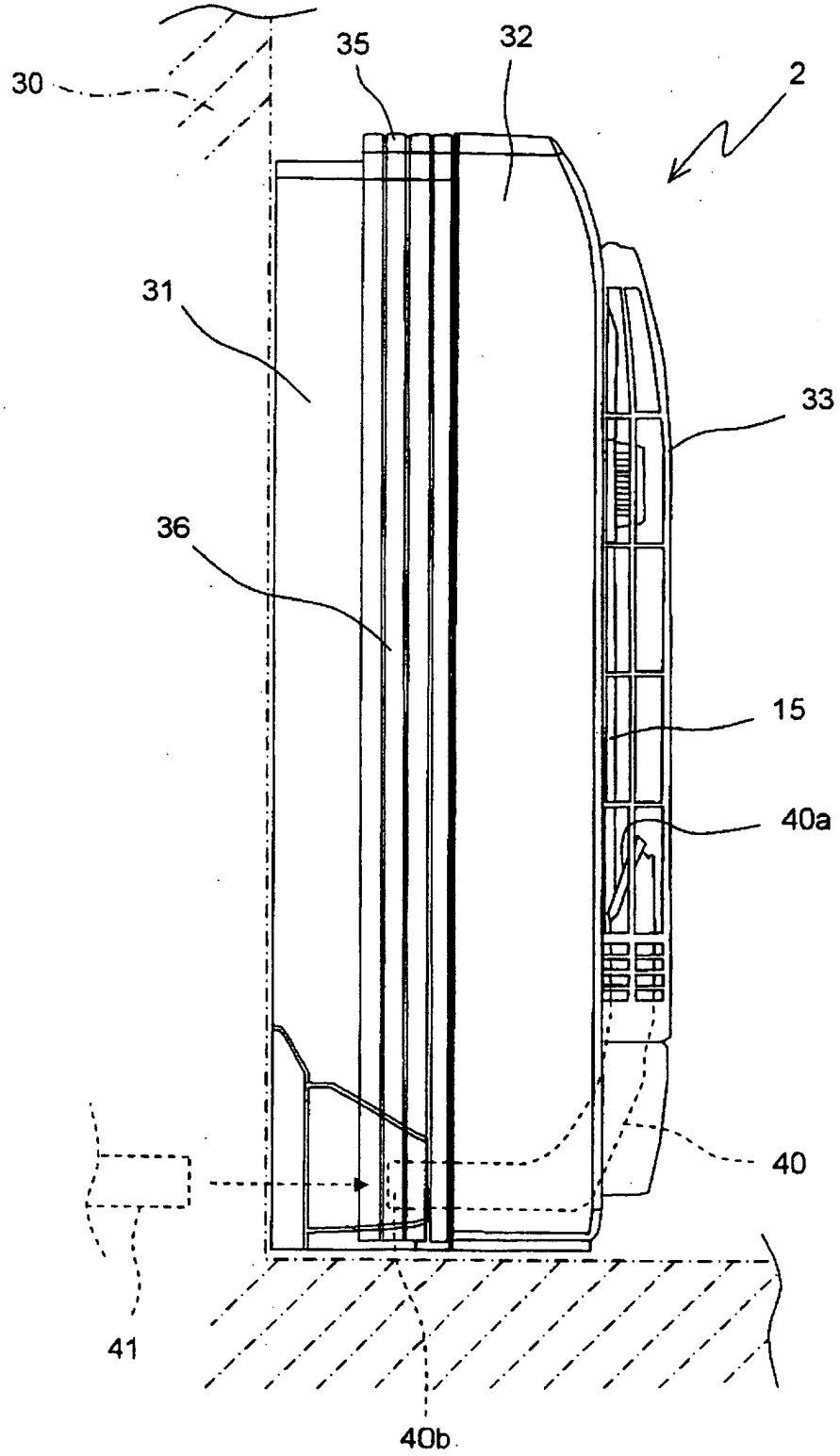


Fig.4

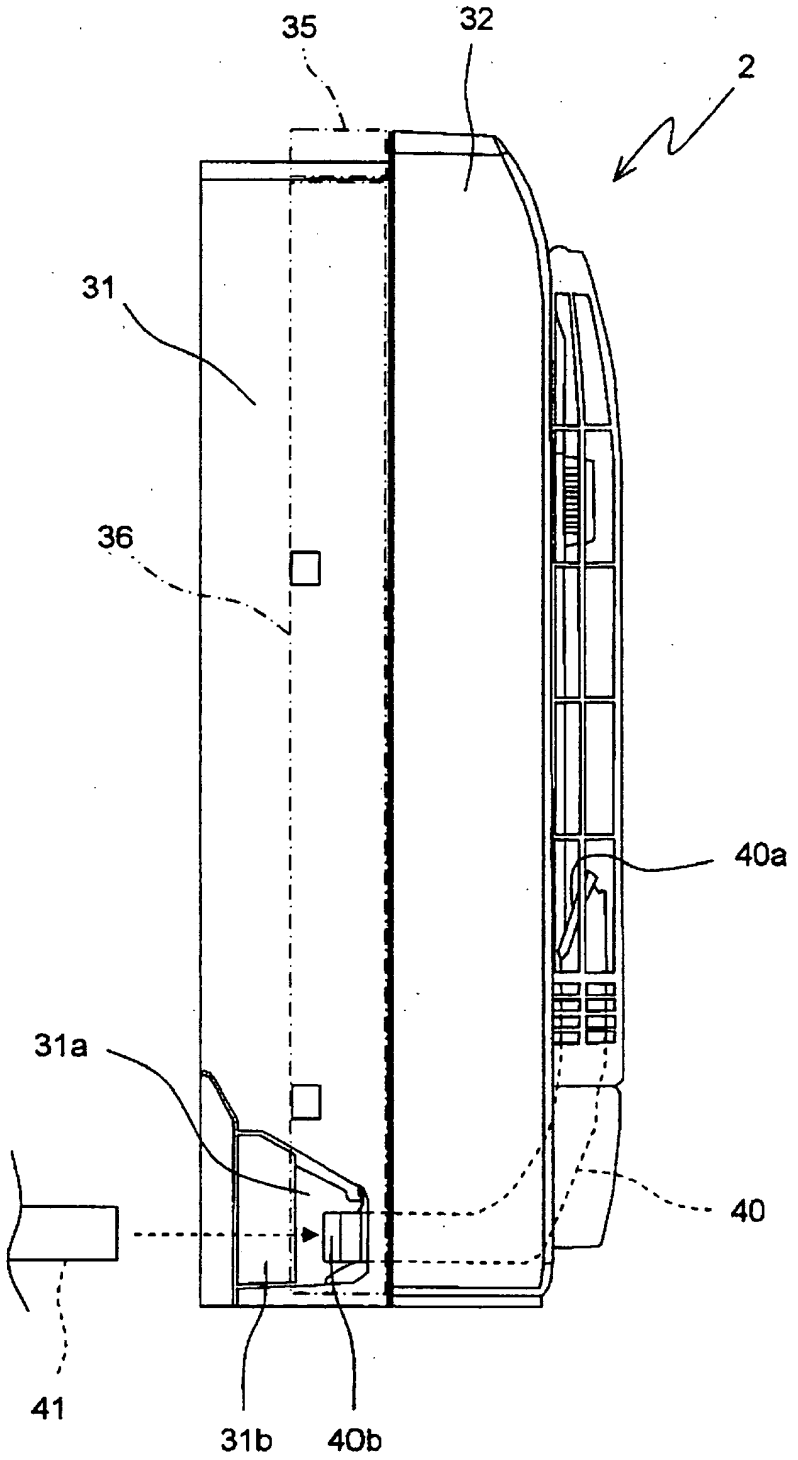


Fig.5

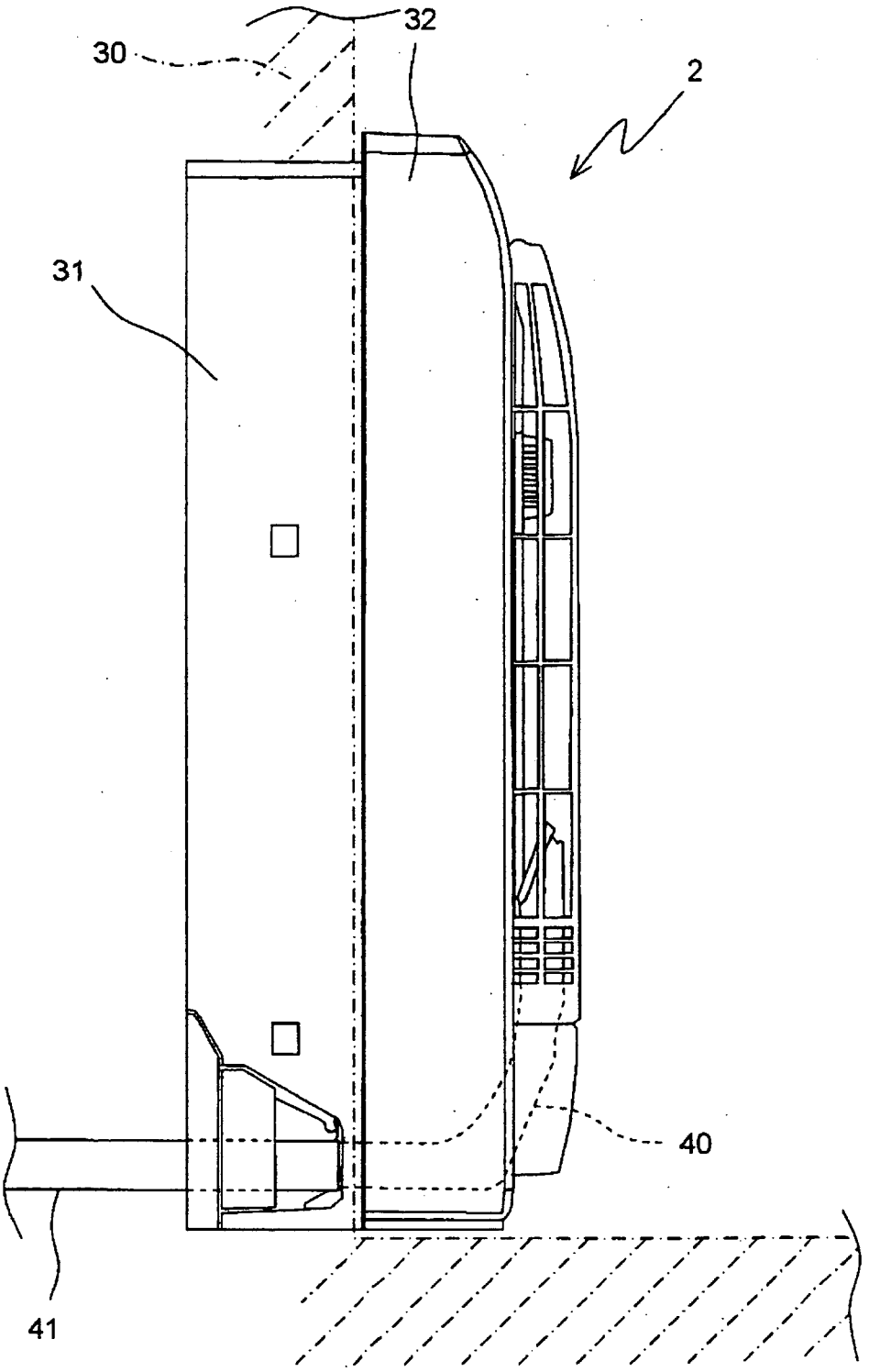


Fig.6

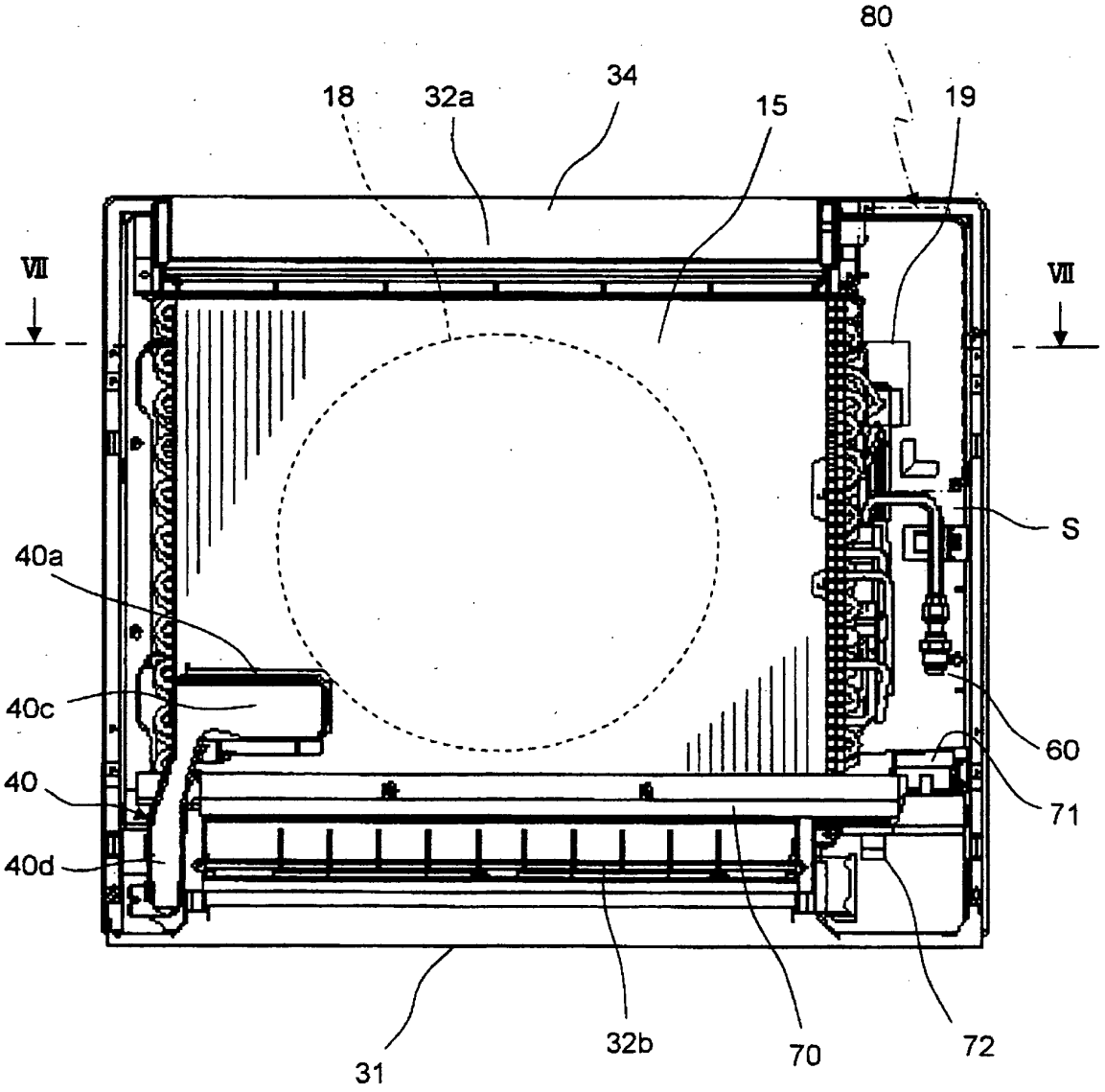


Fig.7

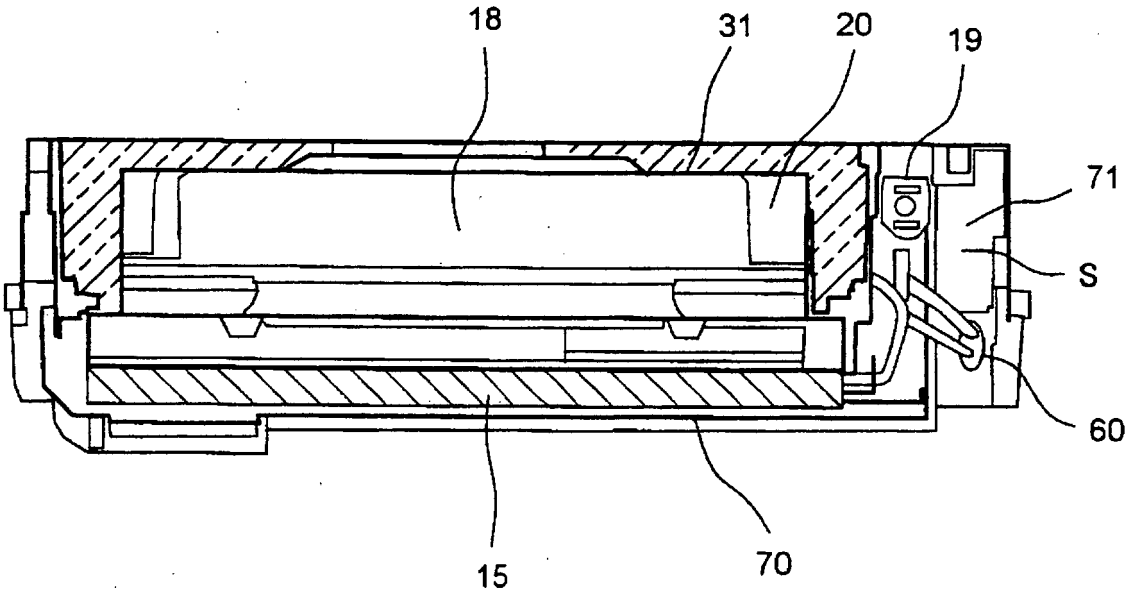


Fig.8

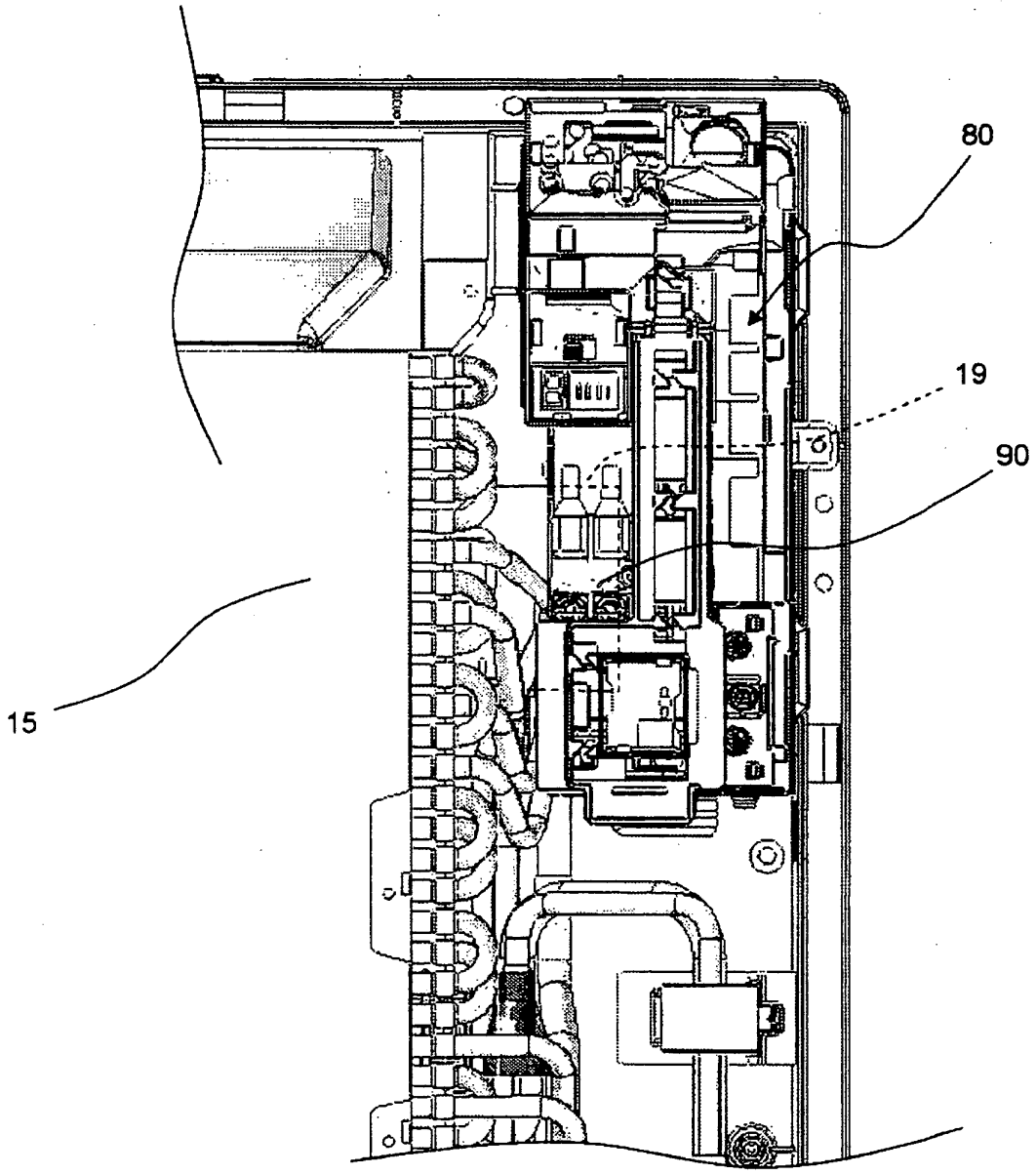


Fig.9

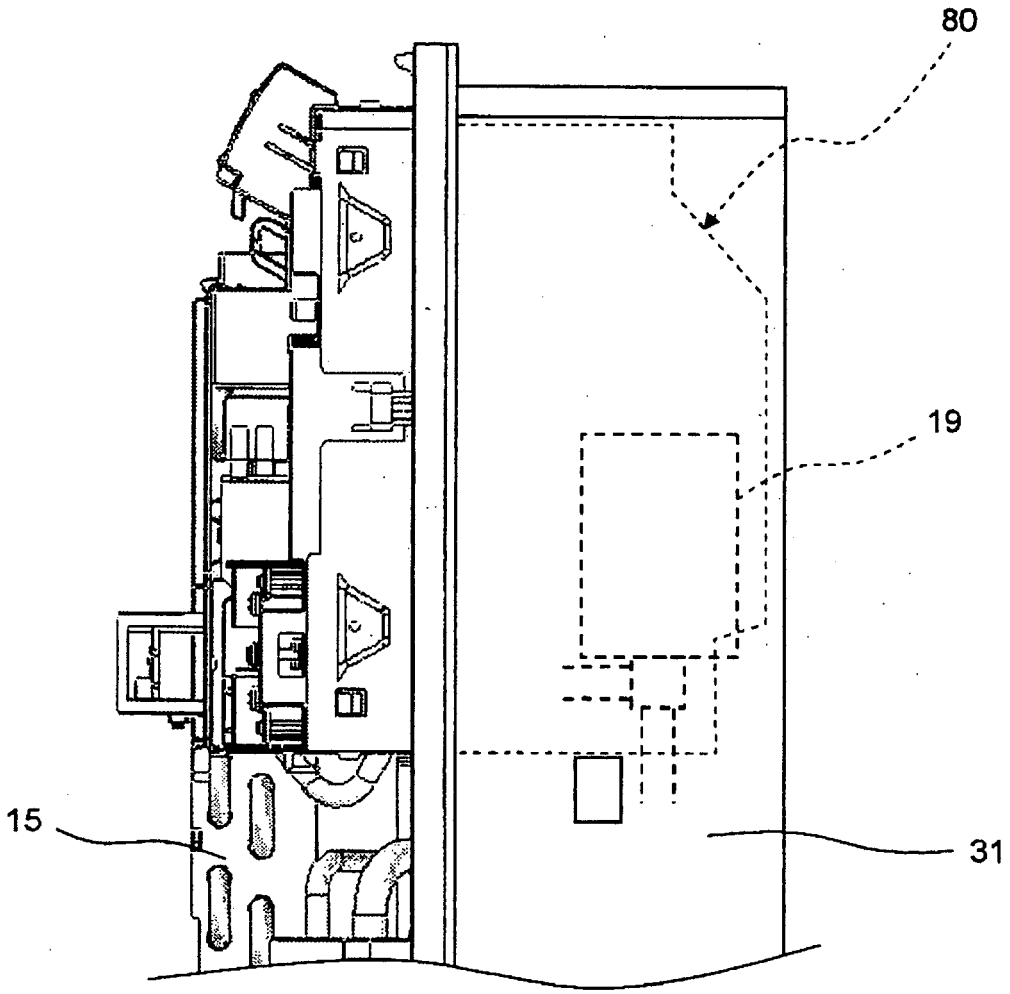


Fig.10

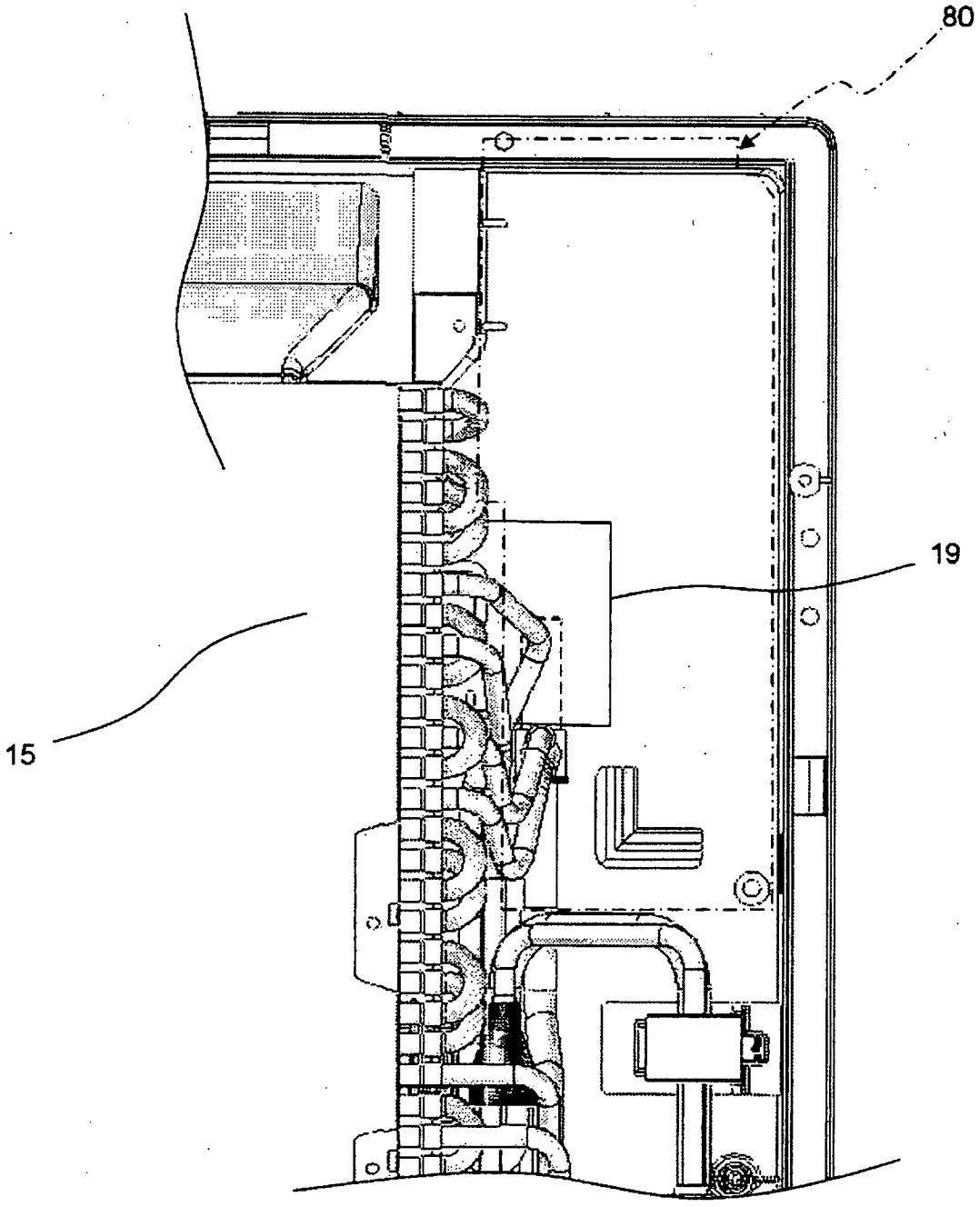
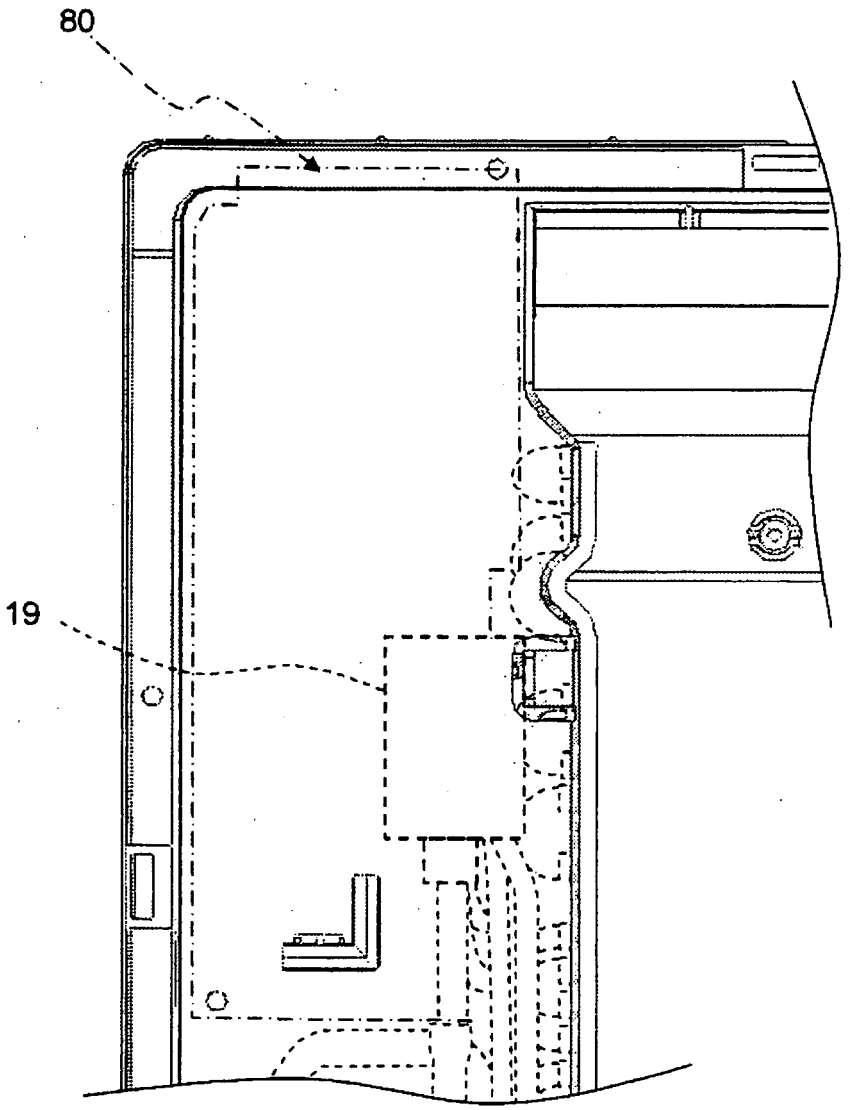


Fig.11



INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2008/054871

A. CLASSIFICATION OF SUBJECT MATTER
F24F13/20(2006.01)i, *F24F1/00*(2006.01)i, *F24F13/22*(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)
F24F13/20, F24F1/00, F24F13/22

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 1996-2008
Kokai Jitsuyo Shinan Koho 1971-2008 Toroku Jitsuyo Shinan Koho 1994-2008

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.
X Y	JP 7-27360 A (Toshiba Corp.), 27 January, 1995 (27.01.95), Par. Nos. [0020], [0021]; Figs. 1 to 4 (Family: none)	1-5 6
Y	JP 7-19517 A (Matsushita Refrigeration Co.), 20 January, 1995 (20.01.95), Par. No. [0007]; Fig. 1 (Family: none)	6

☐ 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	Date of mailing of the international search report
12 May, 2008 (12.05.08)	20 May, 2008 (20.05.08)
Name and mailing address of the ISA/ Japanese Patent Office Facsimile No.	Authorized officer Telephone No.

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Patent documents cited in the description

- JP H11230565 A **[0002]**