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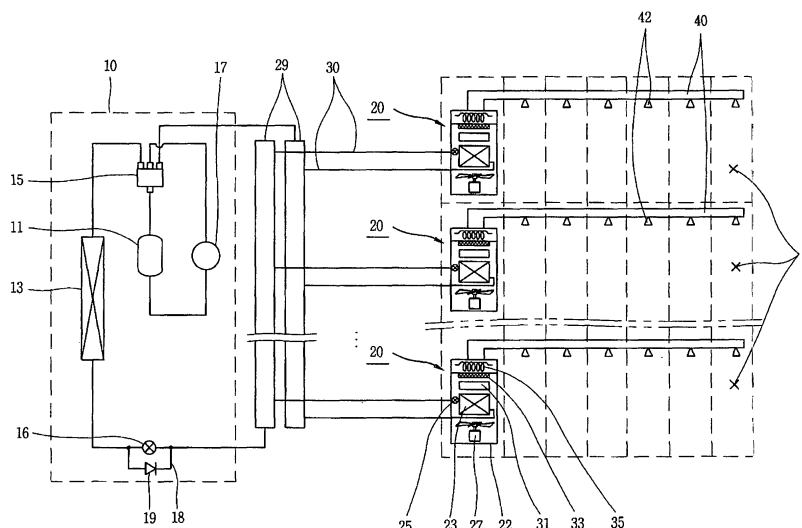
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(54) **Air conditioner**

(57) An air conditioner comprises: at least one outdoor unit having a compressor and an outdoor heat exchanger; an air process unit including a heat exchanger connected to the outdoor unit by a refrigerant pipe, in which the air is heat exchanged, and a blower fan blowing the heat exchanged air; and a duct having one side connected to the air process unit and another side connected

to a plurality of rooms, and introducing to the room, the air blown after heat exchange. Accordingly, the refrigerant pipe is shortened, which reduces pressure loss and a head loss. Also, oil discharged outside of the compressor together with the compressor refrigerant is easily recovered, and the amount of accumulated refrigerant is reduced, thereby reducing the risk of suffocation due to leakage of a refrigerant.

FIG. 2



Description

[0001] The present invention relates to an air conditioner.

[0002] In general, an air conditioner is designed to control the temperature, the humidity, the air current and the cleanness of the air for the purpose of forming a pleasant indoor environment.

[0003] According to the arrangement of units, air conditioners are either integrated type air conditioners which have an indoor unit and an outdoor unit in one case, and separated type air conditioners in which a compressor, a condenser and an evaporator are separately installed such that the outdoor unit includes the compressor and the condenser and the indoor unit includes the evaporator.

[0004] Some air conditioners are provided with flow-path switching valves for switching a flow path of the refrigerant, thereby selectively performing cooling and heating. Recently, so called multi-type air conditioners having a plurality of indoor units have been developed. There are able to perform cooling and heating room by room of a building simultaneously.

[0005] Figure 1 illustrates a related art air conditioner. The related art air conditioner includes an outdoor unit 101, disposed outside, and a plurality of indoor units 111 each disposed in an interior space (e.g. room) to be cooled or heated.

[0006] The outdoor unit 101 includes a compressor (not shown) for compressing a refrigerant and an outdoor heat exchanger (not shown) performing heat-exchange with the outdoor air.

[0007] The indoor unit 111 includes an indoor heat exchanger (not shown) connected to the compressor and the outdoor heat exchanger to constitute a cooling cycle.

[0008] A distribution unit 121 is provided between the outdoor unit 101 and the indoor units 111 so as to distribute to each indoor unit 111 refrigerant provided from the outdoor unit 101. A plurality of connection ports 122 connected to a plurality of refrigerant pipes 123 are provided at the distribution unit 121.

[0009] The related art air conditioner has the following problems.

[0010] If the outdoor unit 101 and the indoor unit 111 are spaced far apart from each other, the related art air conditioner may suffer a significant pressure loss because of an extended pipework 123. Particularly, if there is a significant height difference between the outdoor unit 101 and the indoor unit 111, a considerable loss of head can occur.

[0011] Also, if the refrigerant pipe 123 is too long, oil discharged from the compressor together with compressed refrigerant cannot be recovered.

[0012] Also, if the pipework 123 is lengthened, the amount of accumulated refrigerant is increased, and the refrigerant is more liable to leak. Accordingly, the risk of suffocation is increased. In order to reduce such a risk, a special ventilation system is additionally required,

which increases cost.

[0013] The present invention is defined in the accompanying independent claims. Some preferred features are recited in the dependent claims.

5 **[0014]** Embodiments of the present invention provide an air conditioner having a short refrigerant pipework.

[0015] As embodied and broadly described herein, there is provided an air conditioner comprising: at least one outdoor unit having a compressor and an outdoor heat exchanger; an air process unit including a heat exchanger connected to the outdoor unit by a refrigerant pipe, in which the air is heat exchanged, and a blower fan blowing the heat exchanged air; and a duct having one side connected to the air process unit and another side connected to a plurality of rooms, and introducing to the room, the air blown after heat exchange.

[0016] The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this specification, illustrate embodiments which together with the description serve to explain the principles of the invention.

[0017] In the drawings:

25 Figure 1 is a view of the related art air conditioner in accordance with a conventional art;

Figure 2 is a view of an air conditioner in accordance with a first embodiment;

30 Figure 3 is a configuration view of the air conditioner in accordance with a second embodiment; and

Figure 4 is a configuration view of the air conditioner in accordance with a third embodiment.

35 **[0018]** Reference will now be made in detail to the preferred embodiments of the present invention, examples of which are illustrated in the accompanying drawings.

[0019] Referring to Figure 2, an air conditioner in accordance with a first embodiment includes an outdoor unit 10, an air process unit 20 and a duct 40.

40 **[0020]** The outdoor unit 10 includes a compressor 11 for compressing a refrigerant, and an outdoor heat exchanger 13 disposed at one side of the compressor 11, in which a refrigerant is cooled by heat exchanged with the outdoor air.

45 **[0021]** A flow-path switching valve 15 is installed on the discharge side of the compressor 11 so as to route refrigerant. An accumulator 17 is provided on the intake side of the compressor 11 to receive gaseous refrigerant. A port of the flow-path switching valve is connected to the outdoor heat exchanger 13. Another port is connected to the accumulator 17. Still another port of the flow-path switching valve is connected to a main refrigerant pipe 29.

50 **[0022]** The air process unit 20 includes a cabinet 22, a heat exchanger 23, an indoor expansion device 25 and a blower fan 27. The cabinet 22 is a box defining a space and forming an exterior of the air process unit 20. The heat exchanger 23 is received in the cabinet 22 and is

connected to the compressor 1 and the outdoor heat exchanger 13 to constitute a refrigerant circuit. The indoor expansion device 25 is disposed at the left side of the heat exchanger 23, by which refrigerant is decompressed and expanded. The blower fan 27 is disposed under the heat exchanger 23, to promote heat exchange by the heat exchanger 23 and blow the heat-exchanged air to each room (R).

[0023] An outdoor expansion device 16 is installed on one side of the outdoor heat exchanger 13, and a bypass path 18 having a check valve 19 is connected around the outdoor expansion device 16.

[0024] The main refrigerant pipe 29 and an auxiliary refrigerant pipe 30, allowing each air process unit 20 and the outdoor unit 10 to be in communication with each other, are installed between the outdoor unit 10 and the air process unit 20.

[0025] One side of the main refrigerant pipe 29 is connected to one side of the outdoor unit 10, and the other side thereof is connected to the auxiliary refrigerant pipes 30.

[0026] The auxiliary pipes 30 are connected between the main refrigerant pipe 29, and each of the heat exchangers 23.

[0027] In order to improve performance of the air process unit 20, a humidifier 31, a filter member 33 and an electric heater 35 are additionally installed. The humidifier 31 is installed above the heat exchanger 23 and humidifies the air which has passed through the heat exchanger 23. The filter member 33 is installed above the humidifier 31 and removes matter from the air. The electric heater 35 is installed above the filter member 33 and heats the air which has passed through the heat exchanger 23, again.

[0028] The installation order and position of the above-mentioned heat exchanger 23, the blower fan 27, the humidifier 31, the filter member 33 and the electric heater 35 may be varied in consideration of the performance of the air process unit 20.

[0029] A manifold duct 40 is installed in an upper part of the cabinet 22 and enters each room (R). The duct 40 has an air path allowing air heat exchanged in the heat exchanger 23 to flow to each room (R) through a plurality of discharge holes 42 through which the heat exchanged air can be discharged. Here, the duct may be divided into an air supply duct (not shown) for transferring to each room (R) the air processed by the air process unit 20, and a ventilation duct (not shown) provided with a ventilation fan (not shown) for transferring the air of each room (R) to the air process unit 20.

[0030] The operation of the air conditioner in accordance with the first embodiment will now be described.

[0031] When each room (R) is cooled, the flow-path switching valve 15 switches a flow path so as to route compressed refrigerant to flow to the outdoor heat exchanger 13.

[0032] The refrigerant, having condensed through the outdoor heat exchanger 13, is distributed to the air proc-

ess unit 20, which is in operation, through the main refrigerant pipe 29 and the auxiliary refrigerant pipe 30, and is decompressed and expanded while passing through the indoor expansion device 25.

5 **[0033]** Then, the refrigerant absorbs latent heat by heat exchange in the heat exchanger 23, thereby being evaporated.

[0034] The evaporated refrigerant is combined in the main refrigerant pipe 29 and is taken into the compressor 11 via the flow-path switching valve 15 and the accumulator 17. Such processes are repetitively performed.

10 **[0035]** When the blower fan 27 is operated, the air comes in contact with the heat exchanger 23 and is cooled.

15 **[0036]** Foreign matter in the cooled air is removed as the air passes through the filter member 33, and then the air is discharged to each room (R) through the discharge hole 42 along the duct 40.

[0037] When each room (R) is heated, the flow-path switching valve 15 switches the flow path to route the compressed refrigerant to flow to the air process unit 20.

20 **[0038]** The compressed refrigerant is introduced to the heat exchanger 23 of the air process unit 20 through the main refrigerant pipe 29 and the auxiliary refrigerant pipe 30.

25 **[0039]** The refrigerant heat exchanged and condensed in the heat exchanger 23 passes through the main refrigerant pipe 29 and the auxiliary refrigerant pipe 30, and is compressed and expanded while passing through the outdoor expansion device 16. Then, the refrigerant absorbs latent heat in the outdoor heat exchanger 13 and is evaporated.

30 **[0040]** The evaporated refrigerant is taken into the compressor 11 via the flow-switching valve 15 and the accumulator 17. Such processes are repetitively performed.

35 **[0041]** When the blower fan 27 of the air process unit 20 is operated, the air passes through the heat exchanger 23 to be heated, and is humidified by the humidifier 31.

40 **[0042]** Then, foreign matter in the air is removed as the air passes through the filter member 33, and the air is heated again by the electric heater 35 when necessary, and is discharged to each room (R) through the discharge holes 42.

45 **[0043]** Due to the above-mentioned air process unit 20 and duct 40, a refrigerant pipe 123 (refer to Figure 1) does not need to be extended to the indoor unit 111.

[0044] Namely, when a refrigerant is supplied from the outdoor unit 10 to the air process unit 20 through the main refrigerant pipe 29 and the auxiliary refrigerant pipe 30, heat exchanged air, not refrigerant, is supplied from the air process unit 20 to the room (R) through the duct 40. Therefore, the refrigerant pipe 123 (refer to Figure 1) is no longer required.

50 **[0045]** Accordingly, a long refrigerant pipe 123 (refer to Figure 1) for supplying a refrigerant from the outdoor unit 101 (refer to Figure 1) to the indoor unit 111 (refer to Figure 1) according to the related art air conditioner is

not required. Therefore, the amount of accumulated refrigerant and attendant pressure loss can be reduced.

[0046] An air conditioner in accordance with a second embodiment of the present invention will now be described in detail with reference to Figure 3. The same reference numerals are designated to the same parts as those of the aforementioned structure, and the detailed description thereon will be omitted.

[0047] Referring to Figure 3, the air conditioner in accordance with the second embodiment of the present invention includes an outdoor unit 10, an air process unit 20, a duct manifold 40 and a distribution unit 50.

[0048] The outdoor unit 10 includes a compressor 11 for compressing refrigerant, and an outdoor heat exchanger 13 disposed on one side of the compressor 11, in which a refrigerant is heat exchanged using the outdoor air.

[0049] A flow-path switching valve 14 is installed at a discharge side of the compressor 11 so as to switch a flow path of the refrigerant, and an accumulator 17 is provided at its intake side so as to receive a gaseous refrigerant. A port of the flow-path switching valve 14 is connected to the outdoor heat exchanger 13, and another port is connected to the accumulator 17. Still another port of the flow-path switching valve 14 is connected to the distribution unit 50.

[0050] An outdoor expansion device 16 is installed to one side of the outdoor heat exchanger 13, and a bypass path 18 provided with a check valve 19, is arranged across the expansion device 16 to one side of the outdoor expansion device 16.

[0051] Unlike the first embodiment, the air process unit 20 in accordance with the second embodiment includes a separate cooling unit 21 a and heating unit 21 b such that cooling and heating can be performed on each room (R) at the same time.

[0052] The cooling unit 21 a and the heating unit 21 b each include a cabinet 22, a heat exchanger 23, an indoor expansion device 25, a blower fan 27, and a filter member 33.

[0053] The cabinet 22 is a box forming an exterior of the cooling unit 21 a and the heating unit 21 b.

[0054] The heat exchanger 23 is received in the cabinet 22 and is connected to the compressor 11 and the outdoor heat exchanger 13 to constitute a refrigerant circuit.

[0055] The indoor expansion device 25 for decompressing and expanding a refrigerant is disposed at the right side of the heat exchanger 23.

[0056] The blower fan 27 is disposed under the heat exchanger 23, accelerates heat exchange of the heat exchanger 23, and blows the heat exchanged air so that the air can be supplied to each room (R).

[0057] The filter member 33 is installed above a humidifier 31, and removes foreign substances within the air. The humidifier is not shown but is arranged as illustrated in Figure 2.

[0058] The installation order and position of the

above-mentioned heat exchanger 23, the blower fan 27, and the filter member 33 may be varied in consideration of the performance of the air process unit 20.

[0059] The duct 40 is installed at an upper side of the cabinet 22, and includes separate cooling 41 a and heating ducts 41 b.

[0060] The cooling duct 41 a supplies to each room (R), the air cooled in the cooling unit 21a.

[0061] The heating duct 41 b supplies to each room (R), the air heated in the heating unit 21 b.

[0062] A plurality of discharge holes 42 through which the air is discharged to each room (R) are provided in the cooling duct 41 a and the heating duct 41 b.

[0063] The distribution unit 50 distributes refrigerant, such that part of the air process unit 20 performs a cooling operation and another part thereof performs a heating operation. To this end, the distribution unit 50 includes a high-pressure pipe 52, a low-pressure pipe 54, a liquid pipe 56, a high-pressure valve 53 and a low-pressure valve 55.

[0064] One side of the high-pressure pipe 52 is connected to a discharge side of the compressor 11, and its other side is connected to the air process unit 20.

[0065] One side of the low-pressure pipe 54 is connected to an intake side of the accumulator 17, and its other side is connected to the air process unit 20.

[0066] One side of the liquid pipe 56 is connected to the outdoor heat exchanger 13, and its other side is connected to the air process unit 20.

[0067] The high-pressure valve 53 is installed on and opens and closes the high-pressure pipe 52.

[0068] The low-pressure valve 55 is installed on and opens and closes the low-pressure pipe 54.

[0069] The operation of the air conditioner in accordance with the second embodiment of the present invention will now be described.

[0070] Cooling dominant operation in which the majority of units of the air process unit 20 perform a cooling operation while some few of the units perform a heating operation will be described as an example.

[0071] The flow-path switching valve 14 switches a flow path, such that compressed refrigerant flows to the outdoor heat exchanger 13.

[0072] The refrigerant having passed through the outdoor heat exchanger 13 flows to the distribution unit 50 along the liquid pipe 56. Here, a portion of the refrigerant flows to the distribution unit 50 along the high-pressure pipe 52.

[0073] The refrigerant flowing along the liquid pipe 56 is introduced to the cooling unit 21 a to perform the cooling operation. Here, the air blown as the blower fan 27 is operated comes in contact with the heat exchanger 23 to be cooled. Also, foreign substances of the air are removed by the filter member 33, and then the air is discharged to each room (R) through the discharge hole 42 along the cooling duct 41a.

[0074] The refrigerant having performed the cooling operation passes through the opened low-pressure valve

55 and then is taken into the accumulator 17 along the low-pressure pipe 54.

[0075] The refrigerant flowing along the high-pressure pipe 52 is introduced to the heating unit 21 b through the opened high-pressure valve 53, to thereby perform the heating operation. Here, the air blown as the blower fan 27 of the heating unit 21 b is operated comes in contact with the heat exchanger 23 to be heated. Then, foreign substances of the air are moved by the filter member 33, and the air is discharged to each room (R) to be heated along the heating duct 41 b.

[0076] Due to the air process unit 20, the distribution unit 50 and the duct 40, a related art refrigerant pipe 123 (refer to Figure 1) does not need to be extended to the related art indoor unit 111. In particular, if a refrigerant is supplied from the outdoor unit 10 to the air process unit 20 through the distribution unit 50, heat exchanged air, not the refrigerant, is supplied from the air process unit 20 to the room (R) through the duct 40. Therefore, the refrigerant pipe 123 (refer to Figure 1) is no longer required.

[0077] Accordingly, a long refrigerant pipe like the one of the related art, for supplying refrigerant from the related art outdoor unit 101 (refer to Figure 1) to the related art indoor unit 111, is not required. By this means, the amount of accumulated refrigerant and attendant pressure loss can be reduced.

[0078] An air conditioner in accordance with a third embodiment of the present invention will now be described. The same reference numerals are designated to the same parts as those of the aforementioned structure, and the detailed description thereon will be omitted.

[0079] Referring to Figure 4, the air conditioner in accordance with the third embodiment of the present invention includes an outdoor unit 10, a heat exchange unit 60 and a fan coil unit 65.

[0080] The outdoor unit 10 includes a compressor 11 for compressing refrigerant, and an outdoor heat exchanger 13 disposed on one side of the compressor 11, in which refrigerant is heat exchanged by contact with the outdoor air.

[0081] A flow-path switching valve 15 is installed at a discharge side of the compressor 11 so as to switch a flow path for refrigerant. An accumulator 17 is provided at an intake side thereof so as to take in a gaseous refrigerant. A port of the flow-path switching valve 15 is connected to the outdoor heat exchanger 13, and another port is connected to an accumulator 17. Still another port of the flow-path switching valve 15 is connected to a main refrigerant pipe 29.

[0082] An outdoor expansion device 16 is installed at one side of the outdoor heat exchanger 13, and a bypass path 18 provided with a check valve 19 is arranged on one side of the outdoor expansion device 16.

[0083] A main refrigerant pipe 29 and an auxiliary refrigerant pipe 30 allowing the outdoor unit 10 and the heat exchange unit 60 to be in communication with each other are installed between the outdoor unit 10 and the

heat exchange unit 60.

[0084] One side of the main refrigerant pipe 29 is connected to the outdoor unit 10, and its other side is connected to the auxiliary refrigerant pipe 30.

5 **[0085]** One side of the auxiliary refrigerant pipe 30 is connected to the main refrigerant pipe 29, and its other side connected to the heat exchanger 23.

[0086] The heat exchange unit 60 includes a water storage tank 62 and a heat exchanger 23.

10 **[0087]** The water storage tank 62 has therein a heater 64 for heating stored water. A water pipe 63 is connected to around the water storage tank 62 so as to allow the water to circulate to the fan coil unit 65 disposed in each room (R).

15 **[0088]** A circulation pump 67 enables water to circulate through the water pipe 63.

[0089] The heat exchanger 23 is disposed in the water tank 62 and is connected to the compressor 11 and the outdoor heat exchanger 13.

20 **[0090]** The fan coil unit 65 is installed in each room (R) and is connected to the heat exchange unit 60 by the water pipe 63. An opening and closing valve 69 for opening and closing a flow path is provided at one side of the fan coil unit 65.

25 **[0091]** The operation of the air conditioner in accordance with the third embodiment of the present invention will now be described.

30 **[0092]** When the room (R) is to be cooled, the flow-path switching valve 15 switches a flow path so as to allow compressed refrigerant to flow to the outdoor heat exchanger 13.

35 **[0093]** The refrigerant heat exchanged in the heat exchanger 23 passes through the main refrigerant pipe 29 and the auxiliary refrigerant pipe 30, and then passes through the indoor expansion device 25 of the heat exchange unit 60 to be decompressed and expanded.

40 **[0094]** Here, refrigerant is evaporated by absorbing latent heat in the heat exchanger 23. Also, water circulated by the circulation pump 67 is cooled by the heat exchanger 23, and the cooled water is introduced to the fan coil unit 65 along the water pipe 63 to perform the cooling operation.

45 **[0095]** When the room (R) is to be heated, the flow path switching valve 15 switches a flow path so as to allow a compressed refrigerant to flow toward the heat exchange unit 60.

50 **[0096]** The refrigerant introduced to the heat exchanger 23 of the heat exchange unit 60 after passing through the main refrigerant pipe 29 and the auxiliary refrigerant pipe 30 is condensed by heat exchange with water flowing along the water pipe 63.

55 **[0097]** The condensed refrigerant is decompressed and expanded while passing through the outdoor expansion device 16, is evaporated upon absorbing latent heat in the outdoor heat exchanger 13, and is taken into the compressor 11 via the accumulator 17.

[0098] Water circulated by the circulation pump 67 is heat exchanged with the heat exchanger 23 and is heated

by the heater 64 when necessary, and is introduced to the fan coil unit 65 along the water pipe 63, thereby performing a heating operation.

[0099] Due to the heat exchange unit 60 and the fan coil unit 65, the related art refrigerant pipe 123 (refer to Figure 1) does not need to be extended to the related art indoor unit 111. In particular, when a refrigerant is supplied from the outdoor unit 10 to the heat exchange unit 60 through the main refrigerant pipe 29 and the auxiliary refrigerant pipe 30, heat exchanged water moves along the water pipe 63 from the heat exchange unit 60 to the fan coil unit 65 installed at the room (R), thereby performing heating and cooling operations.

[0100] Accordingly, a long refrigerant pipe 123 (referring to Figure 1) for supplying refrigerant from the outdoor unit 101 to the indoor unit 111 (referring to Figure 1) according to the related art air conditioner is not required. Therefore, the amount of accumulated refrigerant and attendant pressure loss can be reduced.

[0101] In the second embodiment described and illustrated with reference to Figure 3, the case where only the filter member 33 is provided at the heating unit 21 b is taken as an example. However, the humidifier 31 and the electric heater 35 shown in Figure 3 may be further provided at the heating unit 21 b.

[0102] In the third embodiment described and illustrated with reference to Figure 4, the case where cooling or heating operation is made upon switching a flow of a refrigerant is taken as an example. However, the distribution unit 50 shown in Figure 3 may be further provided such that part of the heat exchange unit 60 performs the cooling operation and another part performs the heating operation.

[0103] In the aforescribed embodiments, the case where only one outdoor unit 10 is provided is taken as an example. However, a plurality of outdoor units 10 may be provided.

[0104] As so far described, the air conditioner in accordance with the embodiments of the present invention have the following advantages. First, a pressure loss and a head loss can be reduced because of its shorter refrigerant pipe. Secondly, oil having been discharged outside the compressor together with a compressor refrigerant can be more easily recovered. Thirdly, as the amount of accumulated refrigerant is reduced, the risk of suffocation due to the leakage of refrigerant is reduced. Also, because a special ventilation system for preventing suffocation is not required, cost can be reduced.

[0105] As the present invention may be embodied in several forms without departing from the essential characteristics thereof, it should also be understood that the above-described embodiments are not limited by any of the details of the foregoing description, unless otherwise specified, but rather should be construed broadly within its scope as defined in the appended claims, and therefore all changes and modifications that fall within the metes and bounds of the claims, or equivalence of such metes and bounds are therefore intended to be em-

braced by the appended claims.

Claims

1. An air conditioner comprising:

at least one outdoor unit having a compressor and an outdoor heat exchanger;
an air process unit including a heat exchanger connected to the outdoor unit by a refrigerant pipe, in which air is heat exchanged; and
a duct connected to the air process unit and forming outlets for the discharge of air from the heat exchanger.

2. An air conditioner comprising:

at least one outdoor unit having a compressor, an outdoor heat exchanger and an accumulator;
an air process unit including a cooling unit and a heating unit, each comprising a heat exchanger connected to the outdoor unit by a refrigerant pipe, in which air is heat exchanged, and a blower fan for moving the heat exchanged air;
a duct connected to the air process unit and forming outlets for the discharge of air from the heat exchanger; and
a distribution unit for distributing a refrigerant so as to enable part of the air process unit to perform a cooling operation and enable another part to perform a heating operation.

3. The air conditioner of claim 1 or 2, wherein the refrigerant pipe includes a main refrigerant pipe and an auxiliary refrigerant pipe, wherein one side of the main refrigerant pipe is connected to the outdoor unit and its other side is connected to the auxiliary refrigerant pipe, which is connected to the heat exchanger.

4. The air conditioner of claim 1 or 2, wherein the air process unit further comprises a humidifier for humidifying the heat exchanged air.

5. The air conditioner of claim 1 or 2, wherein the air process unit further comprises a filter member arranged to remove matter from the heat exchanged air.

6. The air conditioner of claim 1 or 2, wherein the air process unit further comprises an electric heater for heating the heat exchanged air.

7. The air conditioner of claim 1 or 2, including a blower arranged to move the heat exchanger air toward the duct.

8. The air conditioner of claim 7, wherein the duct comprises:
 an air supply duct for enabling the air processed by the air process unit to be transferred to each room; and
 a ventilation duct for enabling the air of each room to be transferred to the air process unit. 5
9. The air conditioner of claim 2, wherein the duct comprises:
 a cooling duct for supplying to a room, the air cooled in the cooling unit; and
 a heating duct for supplying to a room, the air heated in the heating unit. 10
10. The air conditioner of claim 2, wherein the distribution unit comprises:
 a high-pressure pipe having one side connected to a discharge side of the compressor and another side connected to the air process unit;
 a low-pressure pipe having one side connected to an intake side of the accumulator and another side connected to the air process unit;
 a liquid pipe having one side connected to the outdoor heat exchanger and another side connected to the air process unit;
 a high-pressure valve installed on the high pressure pipe for opening and closing the high-pressure pipe; and
 a low-pressure valve installed on the low-pressure pipe for opening and closing the low-pressure pipe. 20 25 30 35
11. An air conditioner comprising:
 at least one outdoor unit having a compressor and an outdoor heat exchanger;
 a heat exchange unit connected to the outdoor unit by a refrigerant pipe, in which water is heat exchanged; and
 a fan coil unit connected to the heat exchange unit by a water pipe. 40 45
12. The air conditioner of claim 11, wherein the refrigerant pipe comprises a main refrigerant pipe and an auxiliary pipe,
 wherein one side of the main refrigerant pipe is connected to outdoor unit and its other side is connected to the auxiliary refrigerant pipe, which is connected to the heat exchange unit. 50
13. The air conditioner of claim 11, wherein the heat exchange unit comprises:
 a water storage tank storing water; and
- a heat exchanger received in the water storage tank.
14. The air conditioner of claim 13, further comprising:
 a heater for heating water within the water storage tank.
15. The air conditioner of claim 11, further comprising:
 an opening and closing valve for opening and closing a flow path provided on one side of the fan coil unit.
16. The air conditioner of claim 11, further comprising:
 a distribution unit for distributing a refrigerant so as to allow part of the air process unit to perform a cooling operation and allow the other part to perform a heating operation.

FIG. 1

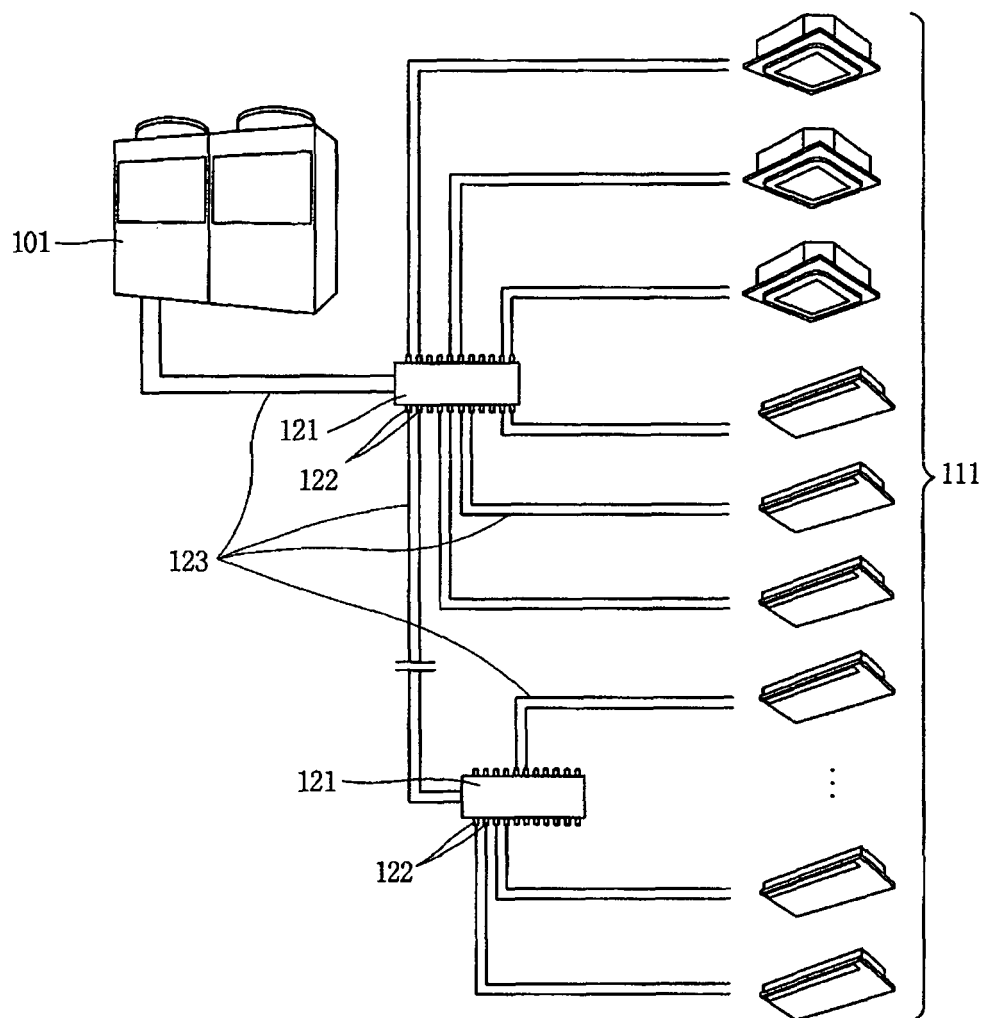


FIG. 2

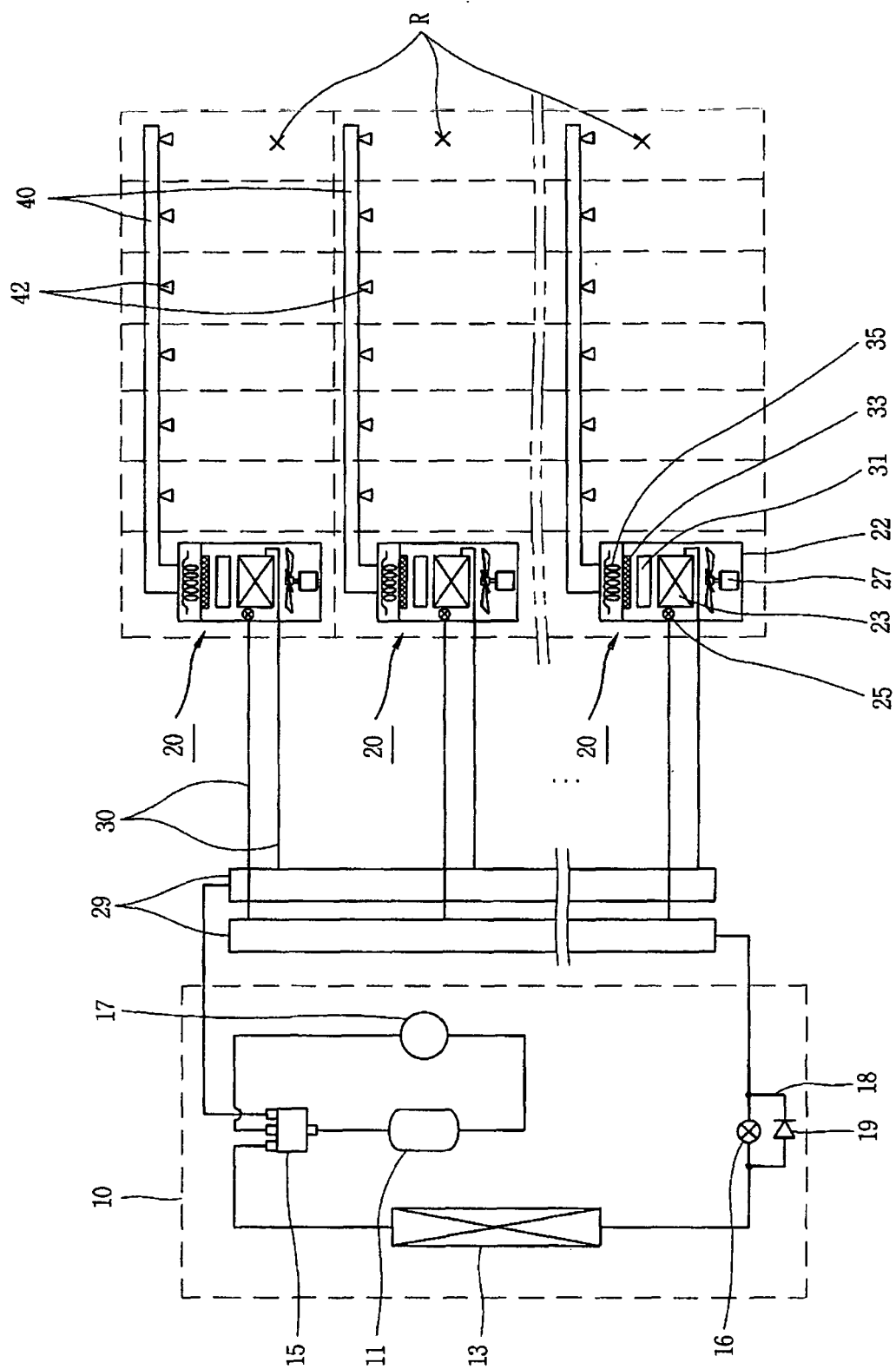


FIG. 3

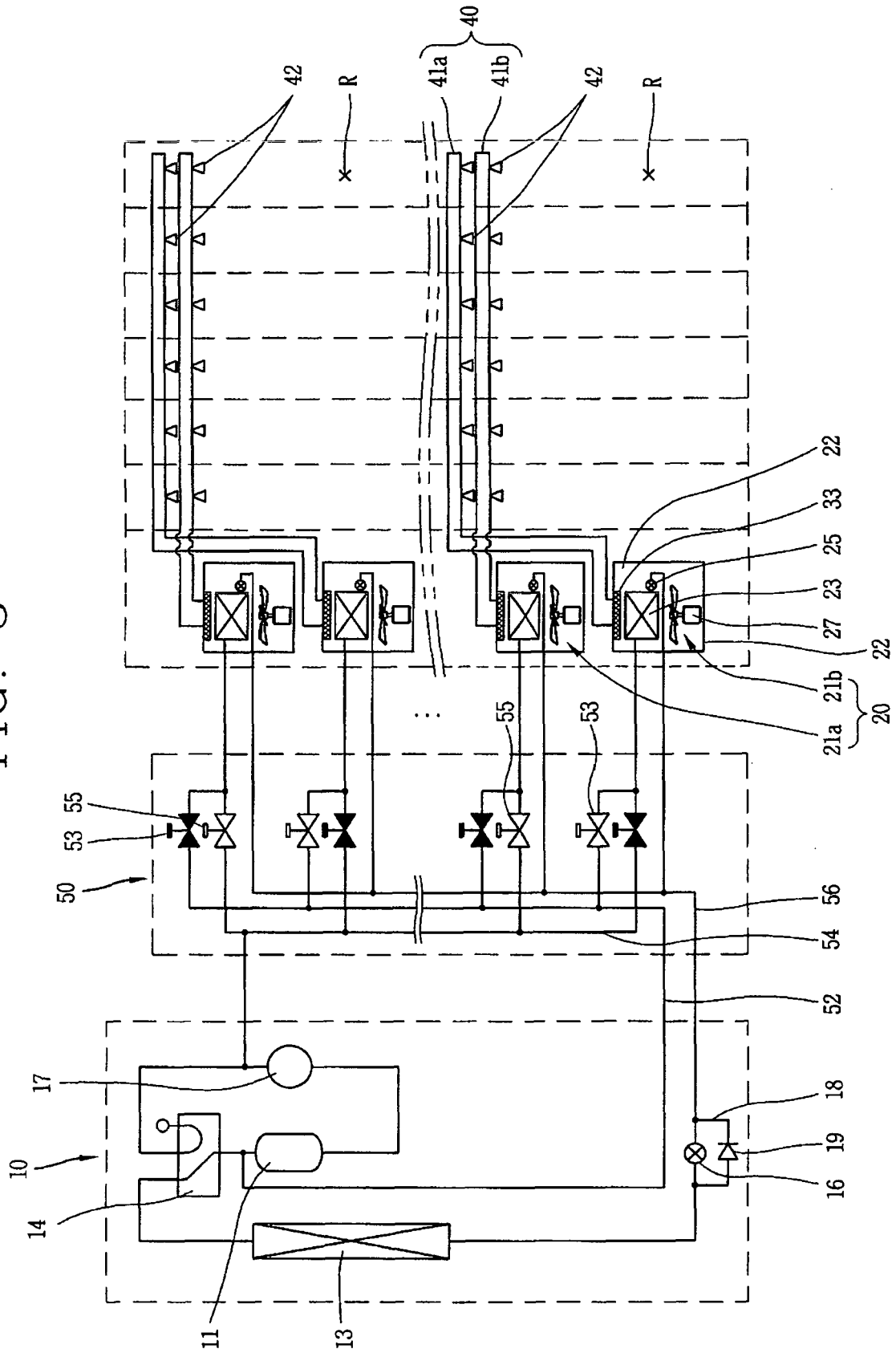


FIG. 4

