

SPECIFICAION

FLOOR INSTALLATION TYPE AIR CONDITIONER

TECHNICAL FIELD

The present invention relates to a floor installation type air conditioner.

5 BACKGROUND ART

As one type of an air conditioner that blows out conditioned air into a room in order to air-condition the room, so called floor installation type air conditioner is provided. This floor installation type air conditioner is a type of air conditioner that is installed on the floor in the room, and there is known a floor installation type air conditioner that
10 comprises a casing provided with two blow-out ports which are spaced apart in the lateral direction in the front view of the air conditioner. Each blow-out port is provided with an air flow direction adjustment member configured to adjust the direction of air flow blown out from the blow-out port. A first blow-out port is provided with a first air flow direction adjustment member, and a second blow-out port is provided with a second air flow
15 direction adjustment member.

With this type of conventional floor installation type air conditioner, the first air flow direction adjustment member and the second air flow direction adjustment member move in an interlocking manner, and consequently the first blow-out port and the second blow-out port blow out air in an even manner. For example, a flap of the first air flow
20 direction adjustment member and a flap of the second air flow direction adjustment member perform opening and closing movements in a symmetric manner in the front view, thus generating symmetric air flow (see Patent Document 1).

<Patent Document 1> JP-A Publication No. 2003-343871 Fig. 3

DISCLOSURE OF THE INVENTION

25 <Object to be achieved by the Invention>

With the above-described floor installation type air conditioner, air is blown out in an even manner, creating an air flow that flows so as to fill the entire room. As a result, a comfortable air conditioned environment is achieved. However, at the same time, it is sometimes difficult to condition air according to the user's preference. For example, when
30 the room where the floor installation type air conditioner is installed is elongated in shape, or when room occupants are gathered at one place in the room, it is difficult to satisfy the user's preference.

In addition, the object to be achieved by blowing out air in an even manner as described above is relevant not only to the direction of air blowing out but also to the

volume of air blown out. In other words, with the conventional floor installation type air conditioner, since the volume of air blown out from the first blow-out port is equal to the volume of air blown out from the second blow-out port, it is difficult to create an air flow according to the user's preference.

Therefore, example embodiments of the present invention seek to provide a floor installation type air conditioner capable of creating an air flow according to the user's preference.

<Means to Achieve the Object>

A floor installation type air conditioner according to a first embodiment of the present invention comprises a casing, a first air flow direction adjustment member, a second air flow direction adjustment member, and a control unit. The casing is provided with a first blow-out port and a second blow-out port laterally juxtaposed in the front view and configured to blow out conditioned air. The first air flow direction adjustment member adjusts the direction of air flow blown out from the first blow-out port. The second air flow direction adjustment member adjusts the direction of air flow blown out from the second blow-out port. The control unit is capable of individually controlling the first air flow direction adjustment member and the second air flow direction adjustment member.

With this floor installation type air conditioner, the first air flow direction adjustment member and the second air flow direction adjustment member can be individually controlled, thus it is possible to asymmetrically move the first air flow direction adjustment member and the second air flow direction adjustment member. Accordingly, it is possible to achieve a greater variety of air flows than when the first air flow direction adjustment member and the second air flow direction adjustment member are symmetrically controlled. Accordingly, with this floor installation type air conditioner, it is possible to create an air flow according to the user's preference.

A floor installation type air conditioner according to a second embodiment of the present invention is the floor installation type air conditioner according to the first embodiment of the present invention, further comprising a single blower fan. The blower fan generates an air flow blown out from the first blow-out port and the second blow-out port.

With this floor installation type air conditioner, the air flow generated by the single blower fan can be distributed to the first blow-out port and the second blow-out port and blown out therefrom. Accordingly, the structure of this case is simple compared to a case where a plurality of blower fans are provided. At the same time, it is possible to easily create an air flow according to the user's preference even with the single blower fan.

A floor installation type air conditioner according to a third embodiment of the present

invention is the floor installation type air conditioner according to the first embodiment or the second embodiment of the present invention, wherein the control unit is capable of controlling the first air flow direction adjustment member and the second air flow direction adjustment member to individually change the direction of air flow blown out from the first blow-out port and the direction of air flow blown out from the second blow-out port.

With this floor installation type air conditioner, the direction of air flow blown out from the first blow-out port and the direction of air flow blown out from the second blow-out port can be individually changed, thus creating a greater variety of air flows. For example, the direction of air flow blown out from the first blow-out port and the direction of air flow blown out from the second blow-out port are spread left and right, thereby creating an air flow that flows so as to fill the entire room. Also for example, the direction of air flow blown out from the first blow-out port and the direction of air flow blown out from the second blow-out port are oriented either left or right, thereby intensively air-conditioning one portion of the room to which the flow directions of air are oriented, or alternatively thereby preventing air from directly hitting one portion of the room.

A floor installation type air conditioner according to a fourth embodiment of the present invention is the floor installation type air conditioner according to any one of the first embodiment to the third embodiment of the present invention, wherein the first air flow direction adjustment member includes a first flap configured to guide air blown out from the first blow-out port and a first motor configured to change the direction of the first flap. In addition, the second air flow direction adjustment member includes a second flap configured to guide air blown out from the second blow-out port and a second motor configured to change the direction of the second flap. Further, the control unit is capable of individually controlling the first motor and the second motor.

With this floor installation type air conditioner, the first motor and the second motor that respectively move the first flap and the second flap can be individually controlled. Accordingly, it is easy to individually control the direction of the first flap and the direction of the second flap.

A floor installation type air conditioner according to a fifth embodiment of the present invention is the floor installation type air conditioner according to the fourth embodiment of the present invention, wherein the first flap and the second flap each include a rotary shaft extending in the vertical direction, and are rotatably provided around the rotary shaft.

With this floor installation type air conditioner, the first flap and the second flap are capable of rotating around the rotary shaft extending in the vertical direction.

Accordingly, by individually changing the direction of the first flap and the direction of the second flap, air can be blown out to various lateral directions in the front view.

A floor installation type air conditioner according to a sixth embodiment of the present invention is the floor installation type air conditioner according to any one of the first embodiment to the fifth embodiment of the present invention, further comprising an input device used by the user to provide instructions to adjust the direction of air flow by the first air flow direction adjustment member and the second air flow direction adjustment member.

With this floor installation type air conditioner, the user can use the input device to provide instructions to adjust the direction of air flow by the first air flow direction adjustment member and the second air flow direction adjustment member. Accordingly, it is possible to create an air flow further according to the user's preference.

A floor installation type air conditioner according to a seventh embodiment of the present invention comprises a casing, a first air volume adjustment member, a second air volume adjustment member, and a control unit. The casing is provided with a first blow-out port and a second blow-out port laterally juxtaposed in the front view and configured to blow out conditioned air. The first air volume adjustment member adjusts the volume of air blown out from the first blow-out port. The second air volume adjustment member adjusts the volume of air blown out from the second blow-out port. The control unit is capable of individually controlling the first air volume adjustment member and the second air volume adjustment member.

With this floor installation type air conditioner, the first air volume adjustment member and the second air volume adjustment member can be individually controlled, thus it is possible to achieve a greater variety of air flows than when the first air volume adjustment member and the second air volume adjustment member are controlled in a similar manner. Accordingly, with this floor installation type air conditioner, it is possible to create an air flow according to the user's preference.

A floor installation type air conditioner according to an eighth embodiment of the present invention is the floor installation type air conditioner according to the seventh embodiment of the present invention, further comprising a single blower fan. The blower fan generates an air flow blown out from the first blow-out port and the second blow-out port.

With this floor installation type air conditioner, an air flow generated by the single blower fan is distributed to the first blow-out port and the second blow-out port and blown out therefrom. Accordingly, the structure of this case is simple compared to a case where a plurality of blower fans are provided. At the same time, it is possible to easily create an air

flow according to the user's preference even with the single blower fan.

A floor installation type air conditioner according to a ninth embodiment of the present invention is the floor installation type air conditioner according to the seventh embodiment or the eighth embodiment of the present invention, wherein the control unit is capable of individually changing the volume of air blown out from the first blow-out port and the volume of air blown out from the second blow-out port.

With this floor installation type air conditioner, the volume of air blown out from the first blow-out port and the volume of air blown out from the second blow-out port can be individually changed, thus achieving a greater variety of air flows. For example, the volume of air blown out from the first blow-out port and the volume of air blown out from the second blow-out port are set to be the same, thereby creating an air flow that air-conditions the room in an even manner. Also for example, either the volume of air blown out from the first blow-out port or the volume of air blown out from the second blow-out port is increased and the other is decreased, thereby intensively air-conditioning one portion of the room, or alternatively thereby preventing air from directly hitting one portion of the room.

A floor installation type air conditioner according to a tenth embodiment of the present invention is the floor installation type air conditioner according to any one of the seventh embodiment to the ninth embodiment of the present invention, wherein the first air volume adjustment member includes a first shutter mechanism configured to change the opening area of the first blow-out port. In addition, the second air volume adjustment member includes a second shutter mechanism configured to change the opening area of the second blow-out port. Further, the control unit is capable of individually controlling the first shutter mechanism and the second shutter mechanism.

With this floor installation type air conditioner, the first shutter mechanism and the second shutter mechanism can be individually controlled. Accordingly, it is easy to individually change the volume of air blown out from the first blow-out port and the volume of air blown out from the second blow-out port.

A floor installation type air conditioner according to an eleventh embodiment of the present invention is the floor installation type air conditioner according to any one of the seventh embodiment to the tenth embodiment of the present invention, further comprising an input device used by the user to provide instructions to adjust the volume of air by the first air volume adjustment member and the second air volume adjustment member.

With this floor installation type air conditioner, the user can use the input device

to provide instructions such that the first air volume adjustment member and the second air volume adjustment member adjust the volume of air. Accordingly, it is possible to create an air flow further according to the user's preference.

In an accordance with an aspect of the present invention, there is provided a floor installation type air conditioner comprising: a casing provided with a first blow-out port and a second blow-out port juxtaposed in a lateral direction in the front view and configured to blow out conditioned air; a first air flow direction adjustment member configured to adjust the lateral direction of air flow blown out from the first blow-out port including a first flap rotatably provided around a rotary shaft extending in the vertical direction, configured to guide air blown out from the first blow-out port and capable of closing the first blow-out port; a second air flow direction adjustment member configured to adjust the lateral direction of air flow blown out from the second blow-out port including a second flap rotatably provided around a rotary shaft extending in the vertical direction, configured to guide air blown out from the second blow-out port and capable of closing the second blow-out port ; and a control unit capable of controlling the first air flow direction adjustment member and the second air flow direction adjustment member such that the first flap and the second flap open asymmetrically.

EFFECTS OF THE PRESENT INVENTION

With the floor installation type air conditioner according to the first embodiment of the present invention, it is possible to achieve a greater variety of air flows than when the first air flow direction adjustment member and the second air flow direction adjustment member are symmetrically controlled, and thus it is possible to create an air flow according to the user's preference.

With the floor installation type air conditioner according to the second embodiment of the present invention, the structure of this case is simple compared to a case where a plurality of blower fans are provided. At the same time, it is possible to easily create an air flow according to the user's preference even with the single blower fan.

With the floor installation type air conditioner according to the third embodiment of the present invention, the direction of air flow blown out from the first blow-out port and the direction of air flow blown out from the second blow-out port can be individually changed, thus it is possible to achieve a greater variety of air flows.

With the floor installation type air conditioner according to the fourth embodiment of the present invention, the first motor and the second motor that respectively move the first flap and the second flap can be individually controlled, thus it is easy to individually control the direction of the first flap and the direction of the second flap.

With the floor installation type air conditioner according to the fifth embodiment of the present invention, the first flap and the second flap are capable of rotating around the rotary shaft extending in the vertical direction. Therefore, by individually changing the

direction of the first flap and the direction of the second flap, air can be blown out to various lateral directions in the front view.

With the floor installation type air conditioner according to the sixth embodiment of the present invention, the user can use the input device to provide instructions to adjust the direction of air flow by the first air flow direction adjustment member and the second air flow direction adjustment member, thus it is possible to create an air flow further according to the user's preference.

With the floor installation type air conditioner according to the seventh embodiment of the present invention, it is possible to achieve a greater variety of air flows than when the first air volume adjustment member and the second air volume adjustment member are

controlled in a similar manner, thus it is possible to create an air flow according to the user's preference.

With the floor installation type air conditioner according to the eighth embodiment of the present invention, the structure of this case is simple compared to a case where a plurality of blower fans are provided. At the same time, it is possible to easily create an air flow according to the user's preference even with the single blower fan.

With the floor installation type air conditioner according to the ninth embodiment of the present invention, the volume of air blown out from the first blow-out port and the volume of air blown out from the second blow-out port can be individually changed, thus achieving a greater variety of air flows.

With the floor installation type air conditioner according to the tenth embodiment of the present invention, the control unit is capable of individually controlling the first shutter mechanism and the second shutter mechanism, thus it is easy to individually change the volume of air blown out from the first blow-out port and the volume of air blown out from the second blow-out port.

With the floor installation type air conditioner according to the eleventh embodiment of the present invention, the user can use the input device to provide instructions to adjust the volume of air by the first air volume adjustment member and the second air volume adjustment member, thus it is possible to create an air flow further according to the user's preference.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is an elevational view of an external appearance of a floor installation type air conditioner. Figure 2 is an elevational view of the structure of the floor installation type air conditioner. Figure 3 is a top cross-sectional view of the structure of the floor installation type air conditioner. Figure 4 is a side cross sectional view of the structure of the floor installation type air conditioner. Figure 5 is an elevational view of the structure of a first horizontal flap portion and a second horizontal flap portion. Figure 6 is a detailed perspective view of the structure of the first horizontal flap portion. Figure 7 is a detailed perspective view of the structure of the first horizontal flap portion. Figure 8 is a control block diagram of a floor installation type air conditioner according to a first embodiment.

Figure 9 is a view showing the movement of a first vertical flap and a second vertical flap.
Figure 10 is a view showing the movement of the first vertical flap and the second vertical flap.

Figure 11 is a view showing the movement of the first horizontal flap and the second
5 horizontal flap.

Figure 12 is a view showing the movement of the first horizontal flap and the second horizontal flap.

Figure 13 is a schematic view to show the effect regarding air blowing out in the present invention.

10 Figure 14 is a schematic view to show the effect regarding air blowing out in the present invention.

Figure 15 is a control block diagram of a floor installation type air conditioner according to a second embodiment.

15 Figure 16 is a schematic view to show the effect regarding air blowing out in the present invention.

DESCRIPTION OF THE REFERENCE SYMBOLS

1	floor installation type air conditioner
3	fan (blower fan)
4	casing
20 5	first vertical flap portion (first air flow direction adjustment member)
7	second vertical flap portion (second air flow direction adjustment member)
10	control unit
11	remote controller (input device)
12	first blow-out port
25 13	second blow-out port
50	first flap motor (first motor)
51	first vertical flap (first flap)
58	first air volume adjustment member
70	second flap motor (second motor)
30 71	second vertical flap (second flap)
78	second air volume adjustment member
AX1	first rotary shaft (rotary shaft)
AX2	second rotary shaft (rotary shaft)
D1	lateral direction

BEST MODE FOR CARRYING OUT THE INVENTION

<First Embodiment>

<Structure>

<Overall Structure>

5 Figure 1 shows an elevational view of an external appearance of a floor installation type air conditioner 1 in which a first embodiment of the present invention is employed. Note that in this embodiment, the terms "lateral direction" and "left-right" used herein refer to the horizontal direction but specifically to a left-right direction in the front view of Figure 1 (see solid arrow D1). In addition, the terms "vertical direction" and
10 "up-down" used herein refer to the up-down direction in the front view of Figure 1 (see solid arrow D2).

 This floor installation type air conditioner 1 is an air conditioner installed on a floor F in a room of a house and configured to air-condition the room, such as cooling or heating. The floor installation type air conditioner 1 is connected to an outdoor unit (not
15 shown) disposed outside, and forms a refrigerant circuit including a compressor and an outside heat exchanger (not shown), which are housed in the outdoor unit. This floor installation type air conditioner 1 mainly comprises a heat exchanger 2, a fan 3 (blower fan), a casing 4, a control unit 10, and a remote controller 11 (input device).

<Heat Exchanger>

20 As shown in Figure 2 and Figure 3, the heat exchanger 2 is housed in the casing 4, and is configured to exchange heat with the air taken into the casing 4. As shown in Figure 2, the heat exchanger 2 occupies the upper half of the floor installation type air conditioner 1, and is disposed at the same height as a first blow-out port 12 and a second blow-out port 13, which are described below. In addition, as shown in Figure 4, the heat exchanger 2 is
25 provided such that the upper portion thereof is inclined toward the rear of the floor installation type air conditioner 1. Figure 2 is an elevational view of the floor installation type air conditioner 1 with a front panel 43 removed. Figure 3 is a cross sectional view taken along line III-III of Figure 1, and Figure 4 is a cross sectional view taken along line IV-IV of Figure 1.

30 <Fan>

 The fan 3 is housed in the casing 4. The fan 3 sucks room air through an air inlet portion 6 (see Figure 1), which is described below, into the casing 4, and subsequently passes the air through the heat exchanger 2 and then sends the same to the first blow-out port 12 and the second blow-out port 13. The fan 3 is a single sirocco fan disposed so as to

rotate within a plane parallel to the front side of the floor installation type air conditioner 1, and is provided below the heat exchanger 2 as shown in Figure 2. In addition, as shown in Figure 4, the fan 3 is disposed in the vicinity of the air inlet portion 6, which is described below. As shown in Figure 2, the fan 3 is housed in a fan casing 30. The fan casing 30 includes a lateral side 32 in a circular arc shape which surrounds approximately 3/4 of the circumference of the fan 3 along a lateral side of the fan 3, and is disposed so as to face the lateral side of the fan 3. The fan casing 30 surrounds the left half of the lateral side and the lower half of the right side of the fan 3. In addition, the fan casing 30 is provided with a fan casing outlet 31. The fan casing outlet 31 is a portion where air moves out from the fan 3 toward the heat exchanger 2 disposed above, and is disposed at a position facing the upper half of the right side of the fan 3, where the fan 3 is not surrounded by the fan casing 30. The fan casing outlet 31 is provided offset to the right of the rotation center of the fan 3. Note that in Figure 2, the fan 3 rotates counterclockwise to send air to the heat exchanger 2 (see open arrow A1 and solid arrow A2 in Figure 2).

<Casing>

The casing 4 is a box shaped member elongated in the vertical direction D2, and is configured to house the heat exchanger 2, the fan 3, and the like. As shown in Figure 3, a corner 42 of a rear surface 40 of the casing 4 is chamfered. As shown in Figure 1, a front side 41 of the casing 4 is formed to include the front panel 43, recessed portions 44, and inclined surfaces 45. In addition, the casing 4 comprises the first blow-out port 12, the second blow-out port 13, the air inlet portion 6, a first vertical flap portion 5 (first air flow direction adjustment member), a second vertical flap portion 7 (second air flow direction adjustment member), a first horizontal flap portion 8, and a second horizontal flap portion 9.

The front panel 43 is a flat portion provided on the front side of the casing 4, generally across the entire vertical direction D2 of the casing 4. In addition, a display unit 46 is provided on the upper portion of the front panel 43. The display unit 46 displays information such as room temperature, outside temperature, operation setting, etc.

Each recessed portion 44 is a depression that is elongated in the vertical direction D2 and provided along the lateral end of the front panel 43, and each recessed portion 44 is provided at both lateral sides of the front panel 43. As shown in Figure 3, each recessed portion 44 is formed by lateral surfaces 440 and curved surfaces 441. The lateral surfaces 440 are continuous with the front panel 43, and are provided perpendicular to the front panel 43. The curved surfaces 441 are continuous with the lateral surfaces 440, and are

further continuous with the inclined surfaces 45.

The inclined surfaces 45 are inclined surfaces provided adjacent to the lateral sides of the recessed portions 44 and across the entire vertical direction D2 of the front side 41. Each inclined surface 45 is provided at both lateral ends of the front side 41.

5 <First Blow-out Port and Second Blow-out Port>

The first blow-out port 12 and the second blow-out port 13 are provided at the upper half of the front side 41 of the casing 4, and configured to blow out the air whose temperature is adjusted by the heat exchanger 2. Note that the air whose temperature is not adjusted may be blown out from the first blow-out port 12 and the second blow-out port 13 during ventilation operation and the like.

10 The first blow-out port 12 and the second blow-out port 13 are rectangular shaped openings elongated in the vertical direction D2, which are provided along both lateral ends of the front side 41. The first blow-out port 12 and the second blow-out port 13 are provided at the upper half of the inclined surfaces 45. The first blow-out port 12 is provided on the left side and the second blow-out port 13 is provided on the right side, with the front panel 43 and the recessed portions 44 interposed therebetween. Accordingly, in the front view, the first blow-out port 12 and the second blow-out port 13 are juxtaposed in the lateral direction D1 with a space therebetween. As shown in Figure 5, the first blow-out port 12 and the second blow-out port 13 each are divided into three portions, i.e., an upper portion S1, a middle portion S2, and a lower portion S3, by partition plates 49. In addition, projections 14a to 14c and 15a to 15c, which project in the vertical direction, are formed at the upper end portions of the first blow-out port 12 and the second blow-out port 13 and at the partition plates 49. The upper end portion of the first blow-out port 12 is provided with the projection 14a that projects downward in the vertical direction, and the partition plates 49 of the first blow-out port 12 are provided with the projections 14b, 14c that project upward in the vertical direction. A first flap motor 50 is fixed in the vicinity of the lower end portion of the first blow-out port 12 such that the edge of its drive shaft faces upward. Further, the projections 14a to 14c and the drive shaft of the first flap motor 50 are aligned in a line in the vertical direction with a space between one another, and configured to correspond to a second rotary shaft AX1 of a first vertical flap 51, which is described below. Similarly, the upper end portion of the second blow-out port 13 is provided with the projection 15a that projects downward in the vertical direction, and the partition plates 49 of the second blow-out port 13 are provided with the projections 15b, 15c that project upward in the vertical direction. A second flap motor 70 is fixed in the

vicinity of the lower end portion of the second blow-out port 13 such that the edge of its drive shaft faces upward. Further, the projections 15a to 15c and the drive shaft of the second flap motor 70 are aligned in a line in the vertical direction with a space between one another, and configured to correspond to a second rotary shaft AX2 of a second vertical flap 71, which is described below. In addition, the projections 14a to 14c provided to the first blow-out port 12 and the drive shaft of the first flap motor 50 are located outside i.e. to the left of the center of the first blow-out port 12, and are located between the center of the first blow-out port 12 and an outer end portion of the first blow-out port 12. Note that the term "center" used herein and below refers to the center in the lateral direction D1. The projections 15a to 15c provided to the second blow-out port 13 and the drive shaft of the second flap motor 70 are located outside i.e. to the right of the center of the second blow-out port 13, and are located between the center of the second blow-out port 13 and the outer end portion of the second blow-out port 13. Note that the first vertical flap 51 and the second vertical flap 71, which are described below, freely rotatably fit over each of the projections 14a to 14c and 15a to 15c, respectively. The lower end of the first vertical flap 51 and the lower end of the second vertical flap 71 are respectively fixed to the drive shaft of the flap motor 50 and the drive shaft of the flap motor 70.

<Air Inlet Portion>

The air inlet portion 6 is a portion for sucking room air into the casing 4. As shown in Figure 1, the air inlet portion 6 is provided at the lower half of the front side 41 of the casing 4. The air inlet portion 6 comprises a first inlet port 61, a second inlet port 62, and lateral side inlet ports 66, 67.

The first inlet port 61 and the second inlet port 62 are openings provided at the lateral surfaces 440 of the recessed portions 44. The recessed portion 44 on the left side is provided with the first inlet port 61, and the recessed portion 44 on the right side is provided with the second inlet port 62. As shown in Figure 4, the first inlet port 61 comprises three openings 63, 64, 65, which are juxtaposed in the vertical direction D2. The opening 63 disposed uppermost is disposed at a position higher than the fan 3, and the other two openings 64, 65 are disposed at positions lower than the fan 3. In other words, the first inlet port 61 is disposed at a position that does not face the fan 3. The same applies to the second inlet port 62. Note that the positions where the inlet ports 61, 62 are disposed are not limited to positions that do not face the fan 3 in a precise sense. The inlet ports 61, 62 may be disposed at positions where they partially overlap the fan 3. Further, the arrangement of the inlet ports 61, 62 is not limited to the case where they are disposed

separately above and below the fan 3, and they may be disposed only above or below the fan 3.

The lateral side inlet ports 66, 67 are openings elongated in the vertical direction D2 as shown in Figure 4, which are each disposed below lateral sides 47 of the floor installation type air conditioner 1. The lateral side inlet ports 66, 67 are located between the fan 3 and the front side 41 when viewed in the width direction D3. Note that Figure 4 shows the lateral side inlet port 66 disposed to the lateral side 47 on the left side in the front view, however, the same applies to the lateral side inlet port 67 disposed to the lateral side 47 on the right side.

Note that a filter (not shown) which covers the lower portion of the casing 4 is provided facing the first inlet port 61, the second inlet port 62, and the lateral side inlet ports 66, 67.

<First Horizontal Flap Portion and Second Horizontal Flap Portion>

The first horizontal flap portion 8 is a portion configured to guide air blown out from the first blow-out port 12 and blow apart the same in the vertical direction D2. As shown in Figure 5, the first horizontal flap portion 8 includes a plurality of first horizontal flaps 80, a first flap adjustment mechanism 21, a second flap adjustment mechanism 22, and a third flap adjustment mechanism 23.

The plurality of first horizontal flaps 80 are provided to the first blow-out port 12 and arranged in juxtaposition in the vertical direction D2, and configured to guide air blown out from the first blow-out port 12 so as to blow apart the same in the vertical direction D2. In this embodiment, the plurality of first horizontal flaps 80 are divided into three groups: a first horizontal flap group G1, a second horizontal flap group G2, and a third horizontal flap group G3, and each group includes five first horizontal flaps 80. The first horizontal flap group G1, the second horizontal flap group G2, and the third horizontal flap group G3 are respectively disposed at the upper portion S1, the middle portion S2, and the lower portion S3 of the first blow-out port 12, and are juxtaposed in the vertical direction D2. Each first horizontal flap 80 is in a thin plate shape formed from an elastic material, and is disposed generally horizontally.

Note that the entirety of the first horizontal flap 80 may not be formed from an elastic material, but only a portion such as the central portion of the first horizontal flap 80 may be formed from an elastic material. In addition, even when the first horizontal flap 80 is not formed from an elastic material, it suffices if the first horizontal flap 80 provides elasticity such as by being formed in a thin-walled shape.

The first flap adjustment mechanism 21 is a mechanism capable of adjusting the direction of the plurality of first horizontal flaps 80 which belong to the first horizontal flap group G1, and includes a first linking member 81 and a first fixing member 84. As shown in Figure 6, the first linking member 81 is a plate shaped member elongated in the vertical direction D2 and configured to link the first horizontal flap group G1 at the vicinity of the front side of outer end portion thereof. The first linking member 81 moves in the vertical direction D2, thereby integrally moving the edge of the first horizontal flap group G1 in the vertical direction D2. In addition, the first linking member 81 is provided with a first slit 801 and a second slit 802 which penetrate the first linking member 81 in the lateral direction D1. The first slit 801 has a rearward convexly curved shape and is provided at the upper portion of the first linking member 81. The second slit 802 has the same shape as the first slit 801, and is provided at the lower portion of the first linking member 81. Two locking claws 121, 122 provided at a peripheral portion of the first blow-out port 12 are respectively inserted in the first slit 801 and the second slit 802. The locking claws 121, 122 are slidably locked respectively in the first slit 801 and the second slit 802. In addition, an operation unit 803, which is inwardly projected, is provided in the vicinity of the center of the inner surface of the first linking member 81 and between the first slit 801 and the second slit 802. The user can easily move the first linking member 81 in the vertical direction D2 by grabbing the operation unit 803. In addition, as shown in Figure 7, a plurality of depressed portions 804, which are inwardly depressed, are provided on the outer surface of the first linking member 81 (note that in Figure 7, a reference numeral is given to only one of the depressed portions 804, and the rest is omitted). The plurality of depressed portions 804 are juxtaposed in the vertical direction D2, and a projection 123 (see Figure 6) provided at the peripheral portion of the first blow-out port 12 is configured to be inserted in one of the depressed portions 804. When the projection 123 is inserted in one of the depressed portions 804, the projection 123 is locked to the depressed portion 804, regulating the movement of the first linking member 81 in the vertical direction D2. When the user grabs the operation unit 803 and applies a force to the first linking member 81, the first linking member 81 moves and the projection 123 is locked to a different depressed portion 804. Accordingly, the first linking member 81 is positioned at a desired position. Note that the plurality of depressed portions 804 are juxtaposed in the vertical direction D2, thus enabling the first linking member 81 to be positioned at a plurality of positions in the vertical direction D2. As shown in Figure 6, the first fixing member 84 is fixed to the rear of the outer end portion of the first horizontal

flap group G1. In addition, as shown in Figure 7, the first fixing member 84 includes a plurality of fixing claws 805 provided so as to correspond to the plurality of first horizontal flaps 80 of the first horizontal flap group G1, and wall portions 806 disposed with respect to the fixing claws 805 and spaced apart from one another. Each fixing claw 805 is provided with a folded portion. When a peripheral portion of the first blow-out port 12 is inserted in a gap between one of the fixing claws 805 and one of the wall portions 806, the folded portion of the fixing claw 805 is locked in a hole 124 provided in the peripheral portion and the first fixing member 84 is fixed to the casing 4.

The second flap adjustment mechanism 22 is a mechanism capable of adjusting the direction of the plurality of first horizontal flaps 80 which belong to the second horizontal flap group G2, and including a second linking member 82 and a second fixing member 85. In addition, the third flap adjustment mechanism 23 is a mechanism capable of adjusting the direction of the plurality of first horizontal flaps 80 which belong to the third horizontal flap group G3, and including a third linking member 83 and a third fixing member 86. The second linking member 82 and the third linking member 83 have the same structure as the first linking member 81; however, each of the linking members 81 to 83 is a separate member and is independently movable. Note that the second linking member 82 links the second horizontal flap group G2 and the third linking member 83 links the third horizontal flap group G3. The second fixing member 85 is fixed to the second horizontal flap group G2 and the third fixing member 86 is fixed to the third horizontal flap group G3.

The second horizontal flap portion 9 is a portion configured to guide air blown out from the second blow-out port 13 in the vertical direction D2. The second horizontal flap portion 9 includes a plurality of second horizontal flaps 90, a fourth flap adjustment mechanism 24, a fifth flap adjustment mechanism 25, and a sixth flap adjustment mechanism 26.

The plurality of second horizontal flaps 90 are juxtaposed at the second blow-out port 13 in the vertical direction D2, and configured to guide air blown out from the second blow-out port 13 in the vertical direction D2. As is the case with the first horizontal flaps 80, the second horizontal flaps 90 are divided into the following three groups: a fourth horizontal flap group G4, a fifth horizontal flap group G5, and a sixth horizontal flap group G6. The fourth flap adjustment mechanism 24 is a mechanism capable of adjusting the direction of the plurality of second horizontal flaps 90 which belong to the fourth horizontal flap group G4, and includes a fourth linking member 91 and a fourth fixing

member 94. The fifth flap adjustment mechanism 25 is a mechanism capable of adjusting the direction of the plurality of second horizontal flaps 90 which belong to the fifth horizontal flap group G5, and includes a fifth linking member 92 and a fifth fixing member 95. In addition, the sixth flap adjustment mechanism 26 is a mechanism capable of
5 adjusting the direction of the plurality of second horizontal flaps 90 which belong to the sixth horizontal flap group G6, and includes a sixth linking member 93 and a sixth fixing member 96.

The fourth linking member 91 links the fourth horizontal flap group G4, the fifth linking member 92 links the fifth horizontal flap group G5, and the sixth linking member
10 93 links the sixth horizontal flap group G6. The second horizontal flaps 90 are disposed symmetric with respect to the first horizontal flaps 80. The fourth horizontal flap group G4 corresponds to the first horizontal flap group G1; the fifth horizontal flap group G5 corresponds to the second horizontal flap group G2; and the sixth horizontal flap group G6 corresponds to the third horizontal flap group G3. In addition, each of the linking members
15 91 to 93 of the second horizontal flap portion 9 has the same structure as each of the linking members 81 to 83 of the first horizontal flap portion 8, and is disposed symmetric with respect to its counterpart. The same applies to the fixing members 94 to 96.

As described above, the first horizontal flaps 80 and the second horizontal flaps 90 are fixed by the fixing members 84 to 86 and 94 to 96 at the rear thereof, and are freely
20 movably linked by the linking members 81 to 83 and 91 to 93 at the front thereof. Accordingly, movement of the linking members 81 to 83 and 91 to 93 causes the first horizontal flaps 80 and the second horizontal flaps 90, which are flexible, to be deformed. For example, as the linking members 81 to 83 and 91 to 93 move upward, the first horizontal flaps 80 and the second horizontal flaps 90 make a curve such that the edges of
25 the first horizontal flaps 80 and the second horizontal flaps 90 face upward (see Figure 11(a)). In addition, as the linking members 81 to 83 and 91 to 93 move downward, the first horizontal flaps 80 and the second horizontal flaps 90 make a curve such that the edges of the first horizontal flaps 80 and the second horizontal flaps 90 face downward (see Figure 11(b)). In this way, movement of the linking members 81 to 83 and 91 to 93 enables to
30 change the direction in which air is guided by the first horizontal flaps 80 and the second horizontal flaps 90.

<First Vertical Flap Portion and Second Vertical Flap Portion>

As shown in Figure 3, the first vertical flap portion 5 and the second vertical flap portion 7 are portions configured to guide air blown out from the first blow-out port 12

and the second blow-out port 13 so as to blow apart the same in the lateral direction D1, and are respectively provided to the first blow-out port 12 and the second blow-out port 13.

5 The first vertical flap portion 5 is a portion configured to adjust the direction of air flow blown out from the first blow-out port 12, and includes the first vertical flap 51 (the first flap) and the first flap motor 50 (the first motor).

10 The first vertical flap 51 is disposed to the left in the front view, and opens and closes the first blow-out port 12. The first vertical flap 51 includes a first plate member 52 that has substantially the same shape as the outer edge of the first blow-out port 12 and has a plate shape elongated in the vertical direction D2, and a plurality of first ribs 53 juxtaposed in the vertical direction D2 on the reverse side surface of the first plate member 52. The first plate member 52 is a member configured to guide air blown out from the first blow-out port 12 in an open state. The first ribs 53 project generally perpendicularly from the reverse side of the first plate member 52, and each of which is provided with a circular 15 hole that penetrates therethrough in the vertical direction D2. The drive shaft of the first flap motor 50 provided to the casing 4 is inserted in a hole of the first rib 53 located in the vicinity of the lower end of the first plate member 52, and is fixed therein (see Figure 5). In addition, the plurality of projections 14a to 14c provided inside the first blow-out port 12 are fitted in other respective holes of the first ribs 53. The first vertical flap 51 is freely 20 rotatably provided around a first rotary shaft AX1 (rotary shaft) that extends in the vertical direction D2 through the holes provided to the first ribs 53. Note that the holes provided to the first ribs 53 are offset to the outside i.e. to the left of the center of the first plate member 52, and is also offset to the outside of the center of the first blow-out port 12. Accordingly, the first rotary shaft AX1 is also located outside the center of the first 25 blow-out port 12, and is located between the center of the first blow-out port 12 and the outer end portion i.e. left end portion of the first blow-out port 12.

The first flap motor 50 rotates the first vertical flap 51 around the first rotary shaft AX1 parallel to the vertical direction D2. The first flap motor 50 changes the positional angle of the first vertical flap 51 to change the direction of the first vertical flap 51. This 30 consequently changes the direction of air flow blown out from the first blow-out port 12. Movement of the first vertical flap 51 at this time is described in detail below.

The second vertical flap portion 7 is a portion configured to adjust the direction of air flow blown out from the second blow-out port 13, and includes the second vertical flap 71 (the second flap) and the second flap motor 70 (second motor). The second vertical flap

71 is disposed to the right in the front view, and opens and closes the second blow-out port 13.

5 The second vertical flap 71 includes a second plate member 72 that has substantially the same shape as the outer edge of the second blow-out port 13 and has a plate shape elongated in the vertical direction D2, and a plurality of second ribs 73 juxtaposed in the vertical direction D2 on the reverse side surface of the second plate member 72. The second plate member 72 is a member configured to guide air blown out from the second blow-out port 13 in an open state. The second ribs 73 project generally perpendicularly from the reverse side of the second plate member 72, and each of which is provided with a circular hole that penetrates therethrough in the vertical direction D2. The 10 drive shaft of the second flap motor 70 provided to the casing 4 is inserted in a hole of the second ribs 73 located in the vicinity of the lower end of the second plate member 72, and is fixed therein. In addition, the plurality of projections 15a to 15c provided inside the second blow-out port 13 are fitted in other respective holes of the second ribs 73. The 15 second vertical flap 71 is freely rotatably provided around a second rotary shaft AX2 (rotary shaft) that extends in the vertical direction D2 through the holes provided to the second ribs 73. Note that the holes provided to the second ribs 73 are offset to the outside i.e. to the right of the center of the second plate member 72, and is also offset to the outside of the center of the second blow-out port 13. Accordingly, the second rotary shaft 20 AX2 is also located outside the center of the second blow-out port 13, and is located between the center of the first blow-out port 12 and the outer end portion i.e. right end portion of the first blow-out port 12.

The second flap motor 70 can be individually driven separately from the first flap motor 50, and rotates the second vertical flap 71 around the second rotary shaft AX2 25 parallel to the vertical direction D2. The second flap motor 70 changes the positional angle of the second vertical flap 71 to change the direction of the second vertical flap 71. This consequently changes the direction of air flow blown out from the second blow-out port 13.

Note that Figure 1 and Figure 3 each show a fully closed state in which the 30 blow-out port 12 and the blow-out port 13 are respectively closed by the first vertical flap 51 and the second vertical flap 71.

<Control Unit and Remote Controller>

As shown in Figure 8, the control unit 10 is connected to the fan 3, the first flap motor 50, the second flap motor 70, and the like, and controls the fan 3, the first flap

motor 50, the second flap motor 70, and the like. The control unit 10 is capable of individually controlling the first flap motor 50 and the second flap motor 70, and is capable of controlling the first vertical flap portion 5 and the second vertical flap portion 7 in different modes. Accordingly, the control unit 10 is capable of moving the first vertical flap 51 and the second vertical flap 71 not only in a symmetric manner but also in an asymmetric manner. Accordingly, it is possible to individually change the direction of air flow blown out from the first blow-out port 12 and the direction of air flow blown out from the second blow-out port 13.

The remote controller 11 is an input device used by the user to provide instructions about operational details to the floor installation type air conditioner 1. The remote controller 11 receives an input of information regarding control details, such as power ON/OFF, switching between cooling and heating, temperature setting, air volume setting, air flow direction setting, etc. Then the remote controller 11 transmits a control signal that corresponds to each input to the control unit 10 via wireless communication means such as infrared rays. For example, the remote controller 11 is capable of receiving an instruction which specifies the direction of the first vertical flap 51 and an instruction which specifies the direction of the second vertical flap 71. In addition, a plurality of operation modes are preset in the control unit 10, and the plurality of operation modes may include an operation mode in which the first vertical flap 51 and the second vertical flap 71 are asymmetrically moved, and in this case, the remote controller 11 only needs to receive an instruction that specifies any one of operation modes to achieve such operation mode.

<Movement>

Movements of the first vertical flap 51, the second vertical flap 71, the first horizontal flaps 80, and the second horizontal flaps 90 and the air flow characterized by the present invention are described in detail.

First, when the fan 3 rotates, the air in the room is sucked into the casing 4 through the first inlet port 61, the second inlet port 62, and the lateral side inlet ports 66, 67 (see Figure 1). Rotation of the fan 3 causes the sucked-in air to flow from the casing outlet 31 to the above of the fan 3, pass through the heat exchanger 2, and be blown out of the first blow-out port 12 and the second blow-out port 13 into the room. At this time, the direction of air flow can be changed to left and right by the first vertical flap portion 5 and the second vertical flap portion 7, and the direction of air flow can be changed to up and down by the first horizontal flap portion 8 and the second horizontal flap portion 9.

<Movements of the First Vertical Flap and the Second Vertical Flap>

When the operation is stopped, as shown in Figure 3, the first blow-out port 12 and the second blow-out port 13 are closed by the first vertical flap portion 5 and the second vertical flap portion 7 (hereinafter this state is referred to as a “fully closed state”).

5 When the floor installation type air conditioner 1 starts operation, the first vertical flap 51 and the second vertical flap 71 move, thereby opening the first blow-out port 12 and the second blow-out port 13. At this time, the first flap motor 50 and the second flap motor 70 are driven, and the first vertical flap 51 rotates around the first rotary shaft AX1, and the second vertical flap 71 rotates around the second rotary shaft AX2. The first vertical flap
10 51 rotates clockwise in the top view, and a right end portion of the first plate member 52 located inside in the fully closed state moves forward. In this way, the first vertical flap 51 rotates such that an inner end portion of the first plate member 52 in the fully closed state comes closer to an outer end portion of the first blow-out port 12. In addition, the second vertical flap 71 rotates counterclockwise in the top view, and a left end portion of the
15 second plate member 72 located inside in the fully closed state moves forward. In this way, the second vertical flap 71 moves such that an inner end portion of the second plate member 72 in the fully closed state comes closer to an outer end portion of the second blow-out port 13. The control unit 10 is capable of opening the first vertical flap 51 and the second vertical flap 71 to a desired opening angle by controlling the first flap motor 50
20 and the second flap motor 70. For example, it is possible to open the first vertical flap 51 and the second vertical flap 71 in a first open state, a second open state, and a third open state as shown in Figure 9. As shown in Figure 9(a), the first open state is a state in which a front end portion of the first plate member 52 and a front end portion of the second plate member 72 face inside. At this time, the front end portion of the first plate member 52 is
25 located inside i.e. to the right of the center of the first blow-out port 12 and a rear end portion of the first plate member 52 is located outside i.e. to the left of the center of the first blow-out port 12. In this first open state, air blown out from the first blow-out port 12 and the second blow-out port 13 is collected toward the center of the floor installation type air conditioner 1 and blown out therefrom. As shown in Figure 9(b), the second open state
30 is a state in which the front end portion of the first plate member 52 and the front end portion of the second plate member 72 face the front. At this time, the first plate member 52 and the second plate member 72 are generally parallel to a direction perpendicular to the front. In this state, the first plate member 52 is located outside the first rotary shaft AX1, and is located outside the center of the first blow-out port 12. In addition, the second

plate member 72 is located outside the second rotary shaft AX2, and is located outside the center of the second blow-out port 13. In this second state, air blown out from the first blow-out port 12 and the second blow-out port 13 is blown out straight to the front. As shown in Figure 9(c), the third open state is a state in which the first plate member 52 and the second plate member 72 are fully open, and the front end portion of the first plate member 52 and the front end portion of the second plate member 72 face the outside. At this time, the front end portion of the first plate member 52 is located outside the outer end portion of the first blow-out port 12, and the rear end portion of the same is located inside the center of the first blow-out port 12. The front end portion of the second plate member 72 is located outside the outer end portion of the second blow-out port 13, and the rear end portion of the same is located inside the center of the first blow-out port 12. In this third open state, air blown out from the first blow-out port 12 and the second blow-out port 13 is widely blown out to the outside.

Note that the first vertical flap 51 and the second vertical flap 71 are not necessarily opened at the above described three stages i.e. the first open state to the third open state; but may be opened at an intermediate angle. In addition, the first vertical flap 51 and the second vertical flap 71 are not necessarily opened in stages; but may be opened at any angle.

In addition, with this floor installation type air conditioner 1, the first vertical flap 51 and the second vertical flap 71 are capable of opening the first blow-out port 12 and the second blow-out port 13 not only by moving in a symmetric manner as shown in Figure 9 but also by separately moving in an asymmetric manner. For example, as shown in Figure 10(a), it is possible to open the first vertical flap 51 in the fully closed state and open the second vertical flap 71 in the third open state at the same time. In addition, as shown in Figure 10(b), it is possible to open the first vertical flap 51 in the first open state and open the second vertical flap 71 in the third open state at the same time.

Note that when the first vertical flap 51 and the second vertical flap 71 respectively close the first blow-out port 12 and the second blow-out port 13, the first vertical flap 51 and the second vertical flap 71 move in the direction opposite from that described above.

<Movements of the First Horizontal Flap and the Second Horizontal Flap>

With this floor installation type air conditioner 1, the first horizontal flap group G1 to the third horizontal flap group G3, and the fourth horizontal flap group G4 to the sixth horizontal flap group G6 are individually capable of changing the angles of the

horizontal flaps 80, 90. Accordingly, the user can set the direction of each of the horizontal flaps 80, 90 at a desired angle. For example, as shown in Figure 11(a), all of the first horizontal flap group G1 to the third horizontal flap group G3 can be set to face upward; or as shown in Figure 11(b), all of the first horizontal flap group G1 to the third horizontal flap group G3 can be set to face downward. When all of the first horizontal flap group G1 to the third horizontal flap group G3 are set to face upward, air blown out from the first blow-out port 12 is blown out upward. Accordingly, it is effective when it is desired to blow cold air upward during cooling operation. In addition, when all of the first horizontal flap group G1 to the third horizontal flap group G3 are set to face downward, air blown out from the first blow-out port 12 is blown out downward. Accordingly, it is effective when it is desired to blow warm air downward during heating operation. The same applies to the fourth horizontal flap group G4 to the sixth horizontal flap group G6.

In addition, since it is possible to individually change the direction of the first horizontal flap group G1 to the sixth horizontal flap group G6, as shown in Figure 12, each of the horizontal flaps 80, 90 may be set to face different directions. For example, in Figure 12(a), the first horizontal flap group G1 is set to face upward; the second horizontal flap group G2 is set to face the front; and the third horizontal flap group G3 is set to face downward. Accordingly, air is blown out upward from the upper portion S1 of the first blow-out port 12; air is blown out straight to the front from the middle portion S2 of the same; and air is blown out downward from the lower portion S3 of the same. Consequently, air can be blown out widely in the vertical direction D2, creating an air flow that flows so as to fill the entire room from above and below. In addition, as shown in Figure 12(b), the first horizontal flap group G1 may be set to face downward; the second horizontal flap group G2 may be set to face the front; and the third horizontal flap group G3 may be set to face upward. In this case, air is blown out downward from the upper portion S1 of the first blow-out port 12; air is blown out straight to the front from the middle portion S2 of the same; and air is blown out upward from the lower portion S3 of the same. Consequently, air can be blown out such that the air is collected to the front, enabling an air flow to reach a long distance. The same applies to the fourth horizontal flap group G4, the fifth horizontal flap group G5, and the sixth horizontal flap group G6.

Note that, with regard to the first horizontal flaps 80, as a result of the movements of the first linking member 81, the second linking member 82, and the third linking member 83 in the vertical direction D2, the first horizontal flaps 80 linked thereto make a curve and consequently their direction changes; however, it is not limited that the positions

of the first linking member 81, the second linking member 82, and the third linking member 83 are changed in stages. Their positions may be changed to desired positions in a continuous manner. In addition, it is not limited that the directions of the first horizontal flaps 80 are changed manually, but they may be changed automatically by providing a drive motor to each of the first horizontal flap group G1, the second horizontal flap group G2, and the third horizontal flap group G3. The same applies to the second horizontal flaps 90.

<Characteristics>

(1)

With this floor installation type air conditioner 1, the first vertical flap 51 and the second vertical flap 71 are opened so as to be positioned outside the center of the first blow-out port 12 and the second blow-out port 13, respectively. As in a conventional floor installation type air conditioner, in the case where the first vertical flap 51 and the second vertical flap 71 are disposed closer to the inside, when the first vertical flap 51 and the second vertical flap 71 are opened in the first open state in which they face inside, the air flow is dispersed to the outside, as shown in Figure 13(a), thus making it difficult to collect the air such that the air flows to the front. On the other hand, when the first vertical flap 51 and the second vertical flap 71 are opened so as to be positioned outside the center of the first blow-out port 12 and the second blow-out port 13, respectively, dispersion of air flow to the outside is suppressed, as shown in Figure 13(b), thus improving the performance to collect the air such that the air flows to the front. Because the air flow is collected toward the center, the performance to blow air straight out is improved. Accordingly, air can flow to reach a long distance.

In addition, with this floor installation type air conditioner 1, the first blow-out port 12 and the second blow-out port 13 are disposed spaced apart in the lateral direction. Therefore, air can be widely blown out to the left and right as the first vertical flap 51 and the second vertical flap 71 widely open to the left and right, as in the third open state shown in Figure 9(c). Accordingly, it is possible to create an air flow that flows so as to fill the space from the left and right by causing air to be blown apart to both left and right.

As described above, with this floor installation type air conditioner 1, a wider control range in the direction of air flow is obtained. Accordingly, this floor installation type air conditioner 1 can be installed at various places and used in various ways.

(2)

With this floor installation type air conditioner 1, the direction of air flow from

the first blow-out port 12 and the direction of air flow from the second blow-out port 13 can be individually controlled. Accordingly, it is possible to distribute the air flow according to the room condition or the user's preference. In addition, since the flexibility of distribution of air flow is improved, it is possible to improve air conditioning efficiency by changing the distribution of air flow according to the shape of the room where the floor installation type air conditioner 1 is placed, or by distributing air flow only to a portion where air conditioning such as cooling and heating is especially needed. For example, in the case where the floor installation type air conditioner 1 is placed at a corner of a long room elongated in one direction, when air is blown out evenly to the left and right, it is difficult to enable air flow to reach a corner diagonal from the floor installation type air conditioner 1. In this case, as shown in Figure 14, by causing the direction of air flow from the first blow-out port 12 and the direction of air flow from the second blow-out port 13 to be offset in the longitudinal direction of the room, it is possible to enable air flow to reach a portion where it has been difficult for air flow to reach.

(3)

With this floor installation type air conditioner 1, the horizontal flaps 80, 90 are divided into a plurality of groups, and it is possible to freely change the direction of the horizontal flaps 80, 90 for each group. Consequently, it enables the user to freely select a mode of air blowing out in the vertical direction D2, according to the shape of the room or the user's preference. For example, it is possible to create an air flow that flows so as to fill the room from above and below. Alternatively, it is possible to collect air flow and thereby expand the area where air flow reaches.

In addition, all of the horizontal flaps 80, 90 do not have to be moved simultaneously. Each of the horizontal flap groups G1 to G3, and G4 to G6 can be separately moved. Accordingly, when moving one of the horizontal flap groups G1 to G6, such an operation can be achieved with a light force, thus improving the operability.

(4)

With this floor installation type air conditioner 1, as described above, it is possible to blow out air in various directions by the first vertical flap 51, the second vertical flap 71, the first horizontal flaps 80, and the second horizontal flaps 90. Accordingly, even when there is provided only one fan 3 instead of a plurality thereof, it is still possible to blow out air in various manners.

<Second Embodiment>

<Structure>

With the first embodiment described above, adjustment of the direction of the left and right air flows can be individually controlled. However, the volume of air from the left and right blow-out ports may be individually controllable. Figure 15 is a control block diagram of the floor installation type air conditioner 1 according to a second embodiment of present invention.

This floor installation type air conditioner 1 comprises a first air volume adjustment member 58 and a second air volume adjustment member 78. The first air volume adjustment member 58 includes a first shutter mechanism configured to change the opening area of the first blow-out port 12, and is capable of adjusting the volume of air blown out from the first blow-out port 12. The second air volume adjustment member 78 includes a second shutter mechanism configured to change the opening area of the second blow-out port 13, and is capable of adjusting the volume of air blown out from the second blow-out port 13. Further, the control unit 10 is capable of individually controlling the first air volume adjustment member 58 and the second air volume adjustment member 78, and is capable of individually changing the volume of air blown out from the first blow-out port 12 and the volume of air blown out from the second blow-out port 13. In addition, by inputting an instruction to the remote controller 11 to adjust the air volume by the first air volume adjustment member 58 and the second air volume adjustment member 78, the user can adjust each of the volume of air from the first blow-out port 12 and the volume of air from the second blow-out port 13 to desired volume. In this case, as is the case with the first embodiment, it is not limited that the user can input an instruction to change the volume of air with respect to each of the first air volume adjustment member 58 and the second air volume adjustment member 78. The user can also enable the first air volume adjustment member 58 and the second air volume adjustment member 78 to operate separately by specifying an operation mode.

Other structures are the same as the floor installation type air conditioner 1 of the first embodiment.

<Characteristics>

With this floor installation type air conditioner 1, the direction of air flow from the first blow-out port 12 and the volume of air from the second blow-out port 13 can be individually controlled, thus it is possible to distribute the air flow according to the room condition or the user's preference. In addition, since the flexibility of distribution of air flow is improved, it is possible to improve air conditioning efficiency by changing the distribution of air flow according to the shape of the room where the floor installation type

air conditioner 1 is placed, or by distributing air flow only to a portion where air conditioning such as cooling and heating is especially needed. For example, in the case where the floor installation type air conditioner 1 is placed at a corner of a long room elongated in one direction, as shown in Figure 16, it is only necessary to increase the
5 volume of air from the blow-out port on the side along the longitudinal direction of the room and decrease the volume of air from the other blow-out port. This enables air flow to reach a portion where it has been difficult for air flow to reach.

<Alternative Embodiment>

(1)

10 With the floor installation type air conditioner 1 according to the above embodiment, each of the first rotary shaft AX1 and the second rotary shaft AX2 is offset to the outside, and thereby the first vertical flap 51 and the second vertical flap 71 are opened in an offset position to the outside. However, the first rotary shaft AX1 and the second rotary shaft AX2 may be respectively disposed at the center of the first blow-out port 12
15 and at the center of the second blow-out port 13. Also in such a case, for example, by means of the shape of the first ribs 53 or by positioning the hole of the first ribs 53 away from the first plate member 52, it is possible to open the first blow-out port 12 such that the first vertical flap 51 is offset to the outside. Note that when taking into account the dimensional limitations of the first blow-out port 12 and the first vertical flap 51, it is
20 more desirable to dispose the first rotary shaft AX1 at a position offset to the outside. The same applies to the second vertical flap 71.

(2)

With the floor installation type air conditioner 1 according to the above embodiment, the first vertical flap 51 rotates clockwise in the top view to open the first
25 blow-out port 12, however, it may rotate counterclockwise to open the first blow-out port 12. The same applies to the second vertical flap 71.

(3)

With the floor installation type air conditioner 1 according to the above embodiment, the first vertical flap 51 and the second vertical flap 71 rotate and thereby
30 open the first blow-out port 12 and the second blow-out port 13, however, it is not limited to such rotary movement and the first blow-out port 12 and the second blow-out port 13 may be opened by a different movement.

(4)

The floor installation type air conditioner 1 according to the above embodiment is

not limited to the one that comprises either one set of the first vertical flap portion 5 and the second vertical flap portion 7 as described in the first embodiment, or the first air volume adjustment member 58 and the second air volume adjustment member 78 as described in the second embodiment. It may be one that simultaneously comprises both sets.

(5)

With the floor installation type air conditioner 1 according to the above embodiment, the first horizontal flaps 80 are divided into the three groups in the vertical direction. However, it suffices if they are divided into at least two groups. For example, they may be divided into two or four groups. The same applies to the second horizontal flaps 90.

INDUSTRIAL APPLICABILITY

The present invention is capable of creating an air flow according to the user's preference, and is useful as a floor installation type air conditioner.

CLAIMS

1. A floor installation type air conditioner comprising: a casing provided with a first blow-out port and a second blow-out port juxtaposed in a lateral direction in the front view and configured to blow out conditioned air; a first air flow direction adjustment member configured to adjust the lateral direction of air flow blown out from the first blow-out port including a first flap rotatably provided around a rotary shaft extending in the vertical direction, configured to guide air blown out from the first blow-out port and capable of closing the first blow-out port; a second air flow direction adjustment member configured to adjust the lateral direction of air flow blown out from the second blow-out port including a second flap rotatably provided around a rotary shaft extending in the vertical direction, configured to guide air blown out from the second blow-out port and capable of closing the second blow-out port ; and a control unit capable of controlling the first air flow direction adjustment member and the second air flow direction adjustment member such that the first flap and the second flap open asymmetrically.
2. The floor installation type air conditioner according to claim 1 further comprising a single blower fan configured to generate an air flow blown out from the first blow-out port and the second blow-out port .
3. The floor installation type air conditioner according to either claim 1 or claim 2, wherein the control unit is capable of individually changing the direction of air flow blown out from the first blow-out port and the direction of air flow blown out from the second blow-out port by controlling the first air flow direction adjustment member and the second air flow direction adjustment member.
4. The floor installation type air conditioner according to any one of claim 1 to claim 3, wherein the first air flow direction adjustment member further includes a first motor configured to change the direction of the first flap, the second air flow direction adjustment member further includes a second

motor configured to change the direction of the second flap, and the control unit is capable of individually controlling the first motor and the second motor.

5. The floor installation type air conditioner according to any one of claim 1 to claim 4, further comprising an input device used by a user to provide instructions to adjust the direction of air flow by the first air flow direction adjustment member and the second air flow direction adjustment member.
6. The floor installation type air conditioner according to claim 5, wherein the input device is capable of specifying the direction of the first flap and the direction of the second flap such that the first flap of the first air flow direction adjustment member and the second flap of the second air flow direction adjustment member open asymmetrically.

Floor-Type Air Conditioner

Abstract

- 5 A floor-type air conditioner capable of realizing airflow according to user's preference. The floor-type air conditioner (1) has a casing (4), a first vertical flap (51), a second vertical flap (71), and a control section. In the casing (4), there are provided a first blowout opening (12) and a second blowout opening (13) that are arranged, in a front view, in the lateral direction (D1) and from
- 10 which conditioned air is blown out. The first vertical flap (51) adjusts the direction of airflow blown out from the first blowout opening (12). The second vertical flap (71) adjusts the direction of airflow blown out from the second blowout opening (13). The control section is capable of individually adjusting the first vertical flap (51) and the second vertical flap (71).

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[Fig. 10]