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(54) **INDOOR UNIT FOR AIR CONDITIONER**

(57) An indoor unit (10) of an air conditioner (1) is equipped with an indoor unit casing (12), an up-and-down airflow direction adjusting blade (30), push-out mechanisms (51, 61), and an angle adjusting mechanism (71). In the indoor unit casing (12), an air blow-out opening (15) is formed. The up-and-down airflow direction adjusting blade (30) is placed in the neighborhood of the blow-out opening (15). The push-out mechanisms (51, 61) are coupled to first coupling portions (32) of the up-and-down airflow direction adjusting blade (30) and are capable of moving the first coupling portions (32) in a direction away from the blow-out opening (15). The angle adjusting mechanism (71) is coupled to a second coupling portion (33) of the up-and-down airflow direction adjusting blade (30) and is capable of moving the second coupling portion (33) in a direction away from the blow-out opening (15). Further, the angle of inclination of the up-and-down airflow direction adjusting blade (30) with respect to the blow-out opening (15) is changed as a result of the distance from the blow-out opening (15) to the first coupling portions (32) being adjusted by the push-out mechanisms (51, 61) and the distance from the blow-out opening (15) to the second coupling portion (33) being adjusted by the angle adjusting mechanism (71).

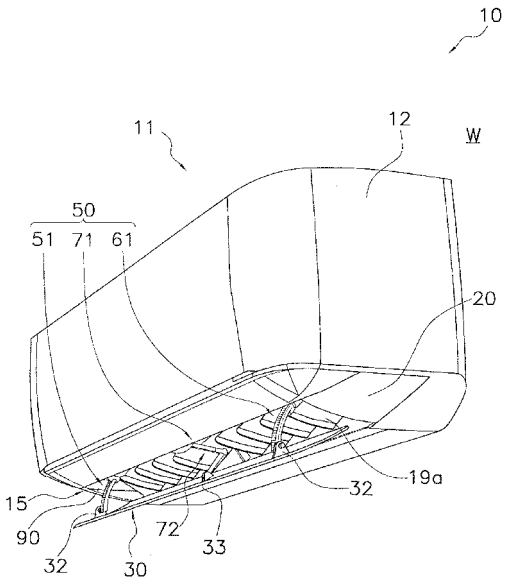

FIG. 2

EP 2 455 679 A1

Description

TECHNICAL FIELD

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

BACKGROUND ART

[0002] Conventionally, among indoor units of air conditioners, there have been indoor units that are equipped with an up-and-down airflow direction adjusting plate that opens and closes an air blow-out opening from which conditioned air is blown out. Further, among such indoor units of air conditioners, there have been indoor units where the angle of inclination of the up-and-down airflow direction adjusting plate with respect to the blow-out opening is adjusted as a result of the up-and-down airflow direction adjusting plate rotating about a rotating shaft, so that the direction of the air that is blown out is adjustable.

[0003] For example, in the air conditioner disclosed in patent citation 1 (JP-A No. 5-256506), an airflow direction adjustable louver (which corresponds to an up-and-down airflow direction adjusting plate) is placed in the neighborhood of a blow-out opening in an indoor unit body (which corresponds to an indoor unit). Further, in this air conditioner, the direction of the air that is blown out is changed as a result of the airflow direction adjustable louver being rotated via a fulcrum (which corresponds to a rotating shaft).

SUIVTMARY OF INVENTION

<Technical Problem>

[0004] Incidentally, in such indoor units of air conditioners, sometimes part of the up-and-down airflow direction adjusting plate ends up intruding inside the casing from the blow-out opening as a result of the angle of inclination of the up-and-down airflow direction adjusting plate with respect to the blow-out opening becoming an angle equal to or greater than a predetermined angle. For this reason, there is the concern that the up-and-down airflow direction adjusting plate and members housed inside the casing will interfere with each other.

[0005] Therefore, it is an object of the present invention to provide an indoor unit of an air conditioner that can reduce the concern that the up-and-down airflow direction adjusting plate and members inside the casing will interfere with each other.

<Solution to Problem>

[0006] An indoor unit of an air conditioner pertaining to a first aspect of the invention includes a casing, an up-and-down airflow direction adjusting plate, a first moving mechanism, and a second moving mechanism. In the casing, an air blow-out opening is formed. The up-and-down airflow direction adjusting plate is placed in the neighborhood of the blow-out opening. The first moving mechanism is coupled to a first portion of the up-and-down airflow direction adjusting plate. Further, the first moving mechanism is capable of moving the first portion in a direction away from the blow-out opening. The second moving mechanism is coupled to a second portion different from the first portion on the up-and-down airflow direction adjusting plate. Further, the second moving mechanism is capable of moving the second portion in a direction away from the blow-out opening. Moreover, the angle of inclination of the up-and-down airflow direction adjusting plate with respect to the blow-out opening is changed as a result of the distance from the blow-out opening to the first portion being adjusted by the first moving mechanism and the distance from the blow-out opening to the second portion being adjusted by the second moving mechanism.

[0007] In the indoor unit of an air conditioner pertaining to the first aspect of the invention, the angle of inclination of the up-and-down airflow direction adjusting plate with respect to the blow-out opening is changed as a result of the distance from the blow-out opening to the first portion being adjusted by the first moving mechanism and the distance from the blow-out opening to the second portion being adjusted by the second moving mechanism. For this reason, for example, in a case where the up-and-down airflow direction adjusting plate moves away from the blow-out opening as a result of the first portion and the second portion moving in a direction away from the blow-out opening, the angle of inclination of the up-and-down airflow direction adjusting plate with respect to the blow-out opening can be changed after moving the first portion and the second portion to a position where the up-and-down airflow direction adjusting plate does not interfere with members inside the casing.

[0008] Because of this, the concern that the up-and-down airflow direction adjusting plate and members inside the casing will interfere with each other can be reduced.

[0009] An indoor unit of an air conditioner pertaining to a second aspect of the invention is the indoor unit of an air conditioner pertaining to the first aspect of the invention, wherein the first moving mechanism moves the first portion placed in a first predetermined position with respect to the blow-out opening to a second predetermined position different from the first predetermined position with respect to the blow-out opening. For this reason, in this indoor unit of an air conditioner, the first portion placed in the first predetermined position can be moved to the second predetermined position.

[0010] An indoor unit of an air conditioner pertaining to a third aspect of the invention is the indoor unit of an air conditioner pertaining to the first or second aspect of the invention, wherein the first moving mechanism slides the first portion in such a way that the up-and-down airflow direction adjusting plate is pushed out from the

neighborhood of the blow-out opening. For this reason, the up-and-down airflow direction adjusting plate can be moved in such a way as to be pushed out from the neighborhood of the blow-out opening.

[0011] An indoor unit of an air conditioner pertaining to a fourth aspect of the invention is the indoor unit of an air conditioner pertaining to any of the first to third aspects of the invention, wherein the second moving mechanism moves the second portion placed in a third predetermined position with respect to the blow-out opening to a fourth predetermined position different from the third predetermined position with respect to the blow-out opening by moving the second portion about the first portion. For this reason, in this indoor unit of an air conditioner, the second portion can be moved from the third predetermined position to the fourth predetermined position.

[0012] An indoor unit of an air conditioner pertaining to a fifth aspect of the invention is the indoor unit of an air conditioner pertaining to any of the first to fourth aspects of the invention, wherein the second moving mechanism moves the second portion by pushing and pulling the second portion of the up-and-down airflow direction adjusting plate. For this reason, in this indoor unit of an air conditioner, the second portion can be moved.

[0013] An indoor unit of an air conditioner pertaining to a sixth aspect of the invention is the indoor unit of an air conditioner pertaining to any of the first to fifth aspects of the invention, wherein the first portion includes a shaft support portion for supporting a rotating shaft of the up-and-down airflow direction adjusting plate. For this reason, in this indoor unit of an air conditioner, the rotating shaft of the up-and-down airflow direction adjusting plate can be moved to a position away from the blow-out opening.

[0014] An indoor unit of an air conditioner pertaining to a seventh aspect of the invention is the indoor unit of an air conditioner pertaining to any of the first to sixth aspects of the invention, wherein a drive source for driving the first moving mechanism and the second moving mechanism is stored inside the casing. For this reason, even when the up-and-down airflow direction adjusting plate moves away from the blow-out opening as a result of the first portion and the second portion being moved by the first moving mechanism and the second moving mechanism, the concern that the drive source will be conspicuous can be reduced.

[0015] An indoor unit of an air conditioner pertaining to an eighth aspect of the invention is the indoor unit of an air conditioner pertaining to any of the first to fifth aspects of the invention, wherein the first portion is placed in two places away from each other on the up-and-down airflow direction adjusting plate. Further, the first moving mechanism is coupled to the first portions in the two places on the up-and-down airflow direction adjusting plate. For this reason, the up-and-down airflow direction adjusting plate can be stably moved compared to, for example, a case where the coupling portion between the up-and-down airflow direction adjusting plate and the first moving mechanism is in only one place.

[0016] An indoor unit of an air conditioner pertaining to a ninth aspect of the invention is the indoor unit of an air conditioner pertaining to the eighth aspect of the invention, wherein the first portions in the two places are placed in the neighborhoods of both end portions of the up-and-down airflow direction adjusting plate. Further, the first portions in the two places include shaft support portions for supporting rotating shafts of the up-and-down airflow direction adjusting plate. For this reason, in this indoor unit of an air conditioner, the rotating shafts of the up-and-down airflow direction adjusting plate can be supported at both end portions of the up-and-down airflow direction adjusting plate.

[0017] An indoor unit of an air conditioner pertaining to a tenth aspect of the invention is the indoor unit of an air conditioner pertaining to any of the first to ninth aspects of the invention and further includes a control unit that controls the driving of the first moving mechanism and the second moving mechanism. Further, the control unit drives the first moving mechanism and the second moving mechanism at arbitrary timings. For this reason, in this indoor unit of an air conditioner, the first moving mechanism and the second moving mechanism can be driven at arbitrary timings.

[0018] An indoor unit of an air conditioner pertaining to an eleventh aspect of the invention is the indoor unit of an air conditioner pertaining to the tenth aspect of the invention, wherein the control unit is capable of executing a first drive mode in which the control unit drives only the first moving mechanism. For this reason, in this indoor unit of an air conditioner, only the first moving mechanism can be driven.

[0019] An indoor unit of an air conditioner pertaining to a twelfth aspect of the invention is the indoor unit of an air conditioner pertaining to the tenth or eleventh aspect of the invention, wherein the control unit is capable of executing a second drive mode in which the control unit drives only the second moving mechanism. For this reason, in this indoor unit of an air conditioner, only the second moving mechanism can be driven.

<Advantageous Effects of Invention>

[0020] In the indoor unit of an air conditioner pertaining to the first aspect of the invention, the concern that the up-and-down airflow direction adjusting plate and members inside the casing will interfere with each other can be reduced.

[0021] In the indoor unit of an air conditioner pertaining to the second aspect of the invention, the first portion placed in the first predetermined position can be moved to the second predetermined position.

[0022] In the indoor unit of an air conditioner pertaining to the third aspect of the invention, the up-and-down airflow direction adjusting plate can be moved in such a way as to be pushed out from the neighborhood of the blow-out opening.

[0023] In the indoor unit of an air conditioner pertaining to the fourth aspect of the invention, the second portion can be moved from the third predetermined position to the fourth predetermined position.

[0024] In the indoor unit of an air conditioner pertaining to the fifth aspect of the invention, the second portion can be moved.

[0025] In the indoor unit of an air conditioner pertaining to the sixth aspect of the invention, the rotating shaft of the up-and-down airflow direction adjusting plate can be moved to a position away from the blow-out opening.

[0026] In the indoor unit of an air conditioner pertaining to the seventh aspect of the invention, the concern that the drive source will be conspicuous can be reduced.

[0027] In the indoor unit of an air conditioner pertaining to the eighth aspect of the invention, the up-and-down airflow direction adjusting plate can be stably moved.

[0028] In the indoor unit of an air conditioner pertaining to the ninth aspect of the invention, the rotating shafts of the up-and-down airflow direction adjusting plate can be supported at both end portions of the up-and-down airflow direction adjusting plate.

[0029] In the indoor unit of an air conditioner pertaining to the tenth aspect of the invention, the first moving mechanism and the second moving mechanism can be driven at arbitrary timings.

[0030] In the indoor unit of an air conditioner pertaining to the eleventh aspect of the invention, only the first moving mechanism can be driven.

[0031] In the indoor unit of an air conditioner pertaining to the twelfth aspect of the invention, only the second moving mechanism can be driven.

BRIEF DESCRIPTION OF DRAWINGS

[0032]

FIG. 1 is a schematic refrigerant circuit diagram of an air conditioner that is equipped with an indoor unit pertaining to an embodiment of the present invention.

FIG. 2 is an external perspective view of the indoor unit at the time of a cooling operation of the air conditioner and in a case where the indoor unit is in a first cooling state.

FIG. 3 is an external perspective view of the indoor unit at the time of a heating operation of the air conditioner and in a case where the indoor unit is in a first heating state.

FIG. 4 is a schematic sectional view of the indoor unit.

FIG. 5 is a plan view of an up-and-down airflow direction adjusting blade.

FIG. 6 is a sectional view (which corresponds to section VI-VI of FIG. 5) of the up-and-down airflow direction adjusting blade.

FIG. 7 is an external perspective view of the up-and-down airflow direction adjusting blade.

FIG. 8 is a plan view of the up-and-down airflow direction adjusting blade and a first mechanism in a case where the state of the up-and-down airflow direction adjusting blade is a first open state and is a conceptual view showing the positional relationship between the up-and-down airflow direction adjusting blade and the first mechanism.

FIG. 9 is a schematic perspective view of the neighborhood of a blow-out opening in a case where the up-and-down airflow direction adjusting blade is in a closed state (side shielding members are omitted).

FIG. 10 is a schematic perspective view of the neighborhood of the blow-out opening in a case where the up-and-down airflow direction adjusting blade is in the first open state (the side shielding members are omitted).

FIG. 11 is a schematic perspective view of the neighborhood of the blow-out opening in a case where the up-and-down airflow direction adjusting blade is in a second open state (the side shielding members are omitted).

FIG. 12 is a schematic perspective view of the neighborhood of the blow-out opening in a case where the up-and-down airflow direction adjusting blade is in a third open state (the side shielding members are omitted).

FIG. 13(a) is a front view of the neighborhood of a left side shielding member and FIG. 13(b) is a perspective view of the neighborhood of the left side shielding member in the indoor unit in which the up-and-down airflow direction adjusting blade and the side shielding members are in the closed state.

FIG. 14(a) is a front view of the neighborhood of the left side shielding member and FIG. 14(b) is a perspective view of the neighborhood of the left side shielding member in the indoor unit in which the up-and-down airflow direction adjusting blade is in the second open state and the side shielding members are in the closed state.

FIG. 15(a) is a front view of the neighborhood of the left side shielding member and FIG. 15(b) is a perspective view of the neighborhood of the left side shielding member in the indoor unit in which the up-and-down airflow direction adjusting blade is in the second open state and the side shielding members are in the open state.

FIG. 16(a) is a schematic partial sectional view of the neighborhood of the left side shielding member in the indoor unit in which the up-and-down airflow direction adjusting blade is in the second open state and the side shielding members are in the closed state and FIG. 16(b) is a schematic partial sectional view of the neighborhood of the left side shielding member in the indoor unit in which the up-and-down airflow direction adjusting blade is in the second open state and the side shielding members are in the open state.

FIG. 17 is a control block diagram of a control unit with which the air conditioner is equipped.

DESCRIPTION OF EMBODIMENTS

[0033] An air conditioner 1 that is equipped with an indoor unit 10 pertaining to an embodiment of the present invention will be described below with reference to the drawings. The embodiment below is a specific example of the present invention and is not intended to limit the technical scope of the present invention.

<Overview of Configuration of Air Conditioner>

[0034] FIG. 1 is a schematic refrigerant circuit diagram of the air conditioner 1. FIG. 2 is a perspective view of the indoor unit 10 at the time of a cooling operation of the air conditioner 1 and in a case where the indoor unit 10 is in a first cooling state. FIG. 3 is a perspective view of the indoor unit 10 at the time of a heating operation of the air conditioner 1 and in a case where the indoor unit 10 is in a first heating state.

[0035] The air conditioner 1 is equipped with the indoor unit 10, which is attached to a wall surface inside a room, and an outdoor unit 2, which is installed outdoors, and can execute various types of operations such as a cooling operation and a heating operation.

[0036] The outdoor unit 2 has a compressor 3, a four-way switching valve 4 that is connected to the discharge side of the compressor 3, an accumulator 5 that is connected to the suction side of the compressor 3, an outdoor heat exchanger 6 that is connected to the four-way switching valve 4, and an outdoor expansion valve 7 that is connected to the outdoor heat exchanger 6. The outdoor expansion valve 7 is connected to one end of a later-described indoor heat exchanger 13 via a refrigerant pipe 8. Further, the four-way switching valve 4 is connected to the other end of the indoor heat exchanger 13 via a refrigerant pipe 8. Further, an outdoor fan 9 is disposed inside the outdoor unit 2. The outdoor fan 9 is a propeller fan that takes in outdoor air and discharges the air after heat exchange in the outdoor heat exchanger 6 to the outside of the outdoor unit 2.

[0037] As shown in FIG. 2, the indoor unit 10 is a wall-mounted indoor unit 10 that is attached to a wall surface W or the like inside a room. Further, as shown in FIG. 2 and FIG. 3, the indoor unit 10 is mainly equipped with an indoor unit body 11, an up-and-down airflow direction adjusting blade 30, side shielding members 20 and 90, a first mechanism 50, and second mechanisms 29 and 99 (see FIG. 17). These will be described below in the order of the indoor unit body 11, the up-and-down airflow direction adjusting blade 30, the side shielding members 20 and 90, the first mechanism 50, and the second mechanisms 29 and 99.

<Configuration of Indoor Unit Body>

[0038] FIG. 4 is a schematic sectional view of the indoor unit 10.

[0039] The indoor unit body 11 is mainly equipped with an indoor unit casing 12, the indoor unit heat exchanger 13, an indoor fan 14, and perpendicular blades 19.

[0040] The indoor unit casing 12 is a substantially rectangular parallelepiped-shaped member that is long in the horizontal direction. Further, the indoor heat exchanger 13, the indoor fan 14, and the perpendicular blades 19 and so forth are stored in the indoor unit casing 12. Moreover, an intake opening (not shown in the drawings) and a blow-out opening 15 are formed in the indoor unit casing 12. The intake opening is an opening for taking room air into the inside of the indoor unit casing 12 and is formed in the upper portion of the indoor unit casing 12.

[0041] Further, the blow-out opening 15 is an opening for blowing out the air that has been conditioned inside the indoor unit body 11 and is formed in the neighborhood of the lower portion of the indoor unit 10. Specifically, the blow-out opening 15 is formed continuously from the bottom surface to both side surfaces of the indoor unit casing 12. For this reason, part of the blow-out opening 15 is visible in a side view of the indoor unit 10.

[0042] Further, an airflow path leading from the intake opening to the blow-out opening 15 is formed inside the indoor unit casing 12. The indoor fan 14, the indoor heat exchanger 13, and the perpendicular blades 19 and so forth are placed inside this airflow path. Further, this airflow path includes a blow-out flow path that is a flow path portion leading from the indoor fan 14 via the perpendicular blades 19 to the blow-out opening 15.

[0043] The indoor heat exchanger 13 comprises a heat transfer tube that is bent plural times at both lengthwise direction ends and plural fins that are inserted through the heat transfer tube, and the indoor heat exchanger 13 performs heat exchange with air coming into contact with it. Further, the indoor heat exchanger 13 functions as a condenser at the time of the heating operation and functions as an evaporator at the time of the cooling operation.

[0044] The indoor fan 14 is a cross-flow fan that has a motor 14a (see FIG. 1) and an impeller that is driven to rotate by the motor 14a. Further, the indoor fan 14 is placed in such a way that it can suck air from the intake opening into the inside of the indoor unit casing 12, pass the air through the indoor heat exchanger 13, and blow out the air from the blow-out opening 15 to the outside of the indoor unit casing 12.

[0045] The perpendicular blades 19 are placed in the blow-out flow path as mentioned above. The perpendicular blades 19 have a drive motor (not shown in the drawings), a coupling rod (not shown in the drawings), and plural blades 19a (see FIG. 2 and FIG. 3) that are coupled together by the coupling rod, and the perpendicular blades 19 are attached to the indoor unit casing 12 in such a way as to be swingable. Further, the surfaces of the plural blades 19a swing left and right as a result of the coupling rod being driven by the drive motor. Moreover, the blades 19a adjust the blow-out direction of the conditioned air in the left-and-right direction of the indoor unit 10 by swinging or stopping at an arbitrary angle after

swinging.

[0046] Further, as shown in FIG. 4, the perpendicular blades 19 include main perpendicular blade portions 19c and side perpendicular blade portions 19d and 19e that are placed on both sides of the main perpendicular blade portions 19c. The side perpendicular blade portions 19d and 19e are configured from a left side perpendicular blade portion 19d that is positioned on the left side of the main perpendicular blade portions 19c and a right side perpendicular blade portion 19e that is positioned on the right side of the main perpendicular blade portions 19c in a front view of the indoor unit 10. Further, the plural blades that the main perpendicular blade portions 19c have and the blade that the left side perpendicular blade portion 19d has and the blade that the right side perpendicular blade portion 19e has are coupled together by different coupling rods. For this reason, the main perpendicular blade portions 19c and the left side perpendicular blade portion 19d and the right side perpendicular blade portion 19e can swing in differing directions.

<Configuration of Up-and-Down Airflow Direction Adjusting Blade>

[0047] FIG. 5 is a plan view of the up-and-down airflow direction adjusting blade 30. FIG. 6 is a sectional view of the up-and-down airflow direction adjusting blade 30. FIG. 7 is an external perspective view of the up-and-down airflow direction adjusting blade 30. FIG. 8 is a plan view of the up-and-down airflow direction adjusting blade 30 and the first mechanism 50 in a case where the state of the up-and-down airflow direction adjusting blade 30 is a first open state and is a conceptual view showing the positional relationship between the up-and-down airflow direction adjusting blade 30 and the first mechanism 50. FIG. 9 is a schematic perspective view of the neighborhood of the blow-out opening 15 in a case where the up-and-down airflow direction adjusting blade 30 is in a closed state. FIG. 10 is a schematic perspective view of the neighborhood of the blow-out opening 15 in a case where the up-and-down airflow direction adjusting blade 30 is in the first open state. FIG 11 is a schematic perspective view of the neighborhood of the blow-out opening 15 in a case where the up-and-down airflow direction adjusting blade 30 is in a second open state. FIG. 12 is a schematic perspective view of the neighborhood of the blow-out opening 15 in a case where the up-and-down airflow direction adjusting blade 30 is in a third open state. In FIG. 9, FIG. 10, FIG. 11, and FIG. 12, the side shielding members 20 and 90 are omitted.

[0048] The up-and-down airflow direction adjusting blade 30 is a plate-like member that is long in the lengthwise direction (horizontal direction) of the indoor unit 10. Further, the up-and-down airflow direction adjusting blade 30 is placed in the lower portion of the indoor unit 10. Specifically, the up-and-down airflow direction adjusting blade 30 is placed in the neighborhood of an open portion formed in the bottom surface of the indoor unit casing 12.

[0049] Moreover, the up-and-down airflow direction adjusting blade 30 has coupling portions 32 and 33 that couple to the later-described first mechanism 50. The coupling portions 32 and 33 are placed on a surface (below, called an inside surface 30a) of the up-and-down airflow direction adjusting blade 30 on the opposite side of a surface (below, called an outside surface 30b) of the up-and-down airflow direction adjusting blade 30 that can be seen from the outside of the indoor unit 10 in a state where the up-and-down airflow direction adjusting blade 30 is covering the blow-out opening 15. Further, the coupling portions 32 and 33 include first coupling portions 32 and a second coupling portion 33. As shown in FIG. 5, the first coupling portions 32 are placed in two places apart from each other on the up-and-down airflow direction adjusting blade 30. Specifically, as shown in FIG. 5 and FIG. 8, the first coupling portions 32 are placed in the neighborhoods of both end portions 30g and 30h of the up-and-down airflow direction adjusting blade 30 and in the neighborhood of one long edge (below, called a first long edge 30c) of the up-and-down airflow direction adjusting blade 30. As shown in FIG. 5, the second coupling portion 33 is placed in the vicinity of the substantial center in the lengthwise direction of the up-and-down airflow direction adjusting blade 30 and in the neighborhood of a second long edge 30d that is an edge opposing the first long edge 30c of the up-and-down airflow direction adjusting blade 30.

[0050] Further, as shown in FIG. 5 and FIG. 6, the first coupling portions 32 and the second coupling portion 33 include shaft support portions 32a and 33a, respectively. The shaft support portions 32a and 33a rotatably support later-described support shafts 57, 67, and 78. Further, the shaft support portions 32a and 33a are configured by members having excellent slidability (high sliding members) and can suppress friction and allow the support shafts 57, 67, and 78 to smoothly rotate.

[0051] Moreover, the up-and-down airflow direction adjusting blade 30 is capable of taking four states (a closed state, a first open state, a second open state, and a third open state). Hereinafter, for the convenience of description, the portion of the blow-out opening 15 that is covered by the up-and-down airflow direction adjusting blade 30 in a case where the state of the up-and-down airflow direction adjusting blade 30 is the closed state-that is, the space in which the up-and-down airflow direction adjusting blade 30 is placed in a case where the state of the up-and-down airflow direction adjusting blade 30 is the closed state-will be called a first portion 16 of the blow-out opening 15. Further, "shielded" in the present embodiment means a state where a member capable of covering a predetermined portion of the blow-out opening 15 is covering substantially all of that predetermined portion, and "open" in the present embodiment means a state where a member capable of covering a predetermined portion of the blow-out opening 15 is not covering substantially all of that predetermined portion.

For example, a state where substantially all of the first portion 16 of the blow-out opening 15 is being covered by the up-and-down airflow direction adjusting blade 30 will be taken to be a state where the first portion 16 of the blow-out opening 15 is being shielded, and a state where substantially all of the first portion 16 of the blow-out opening 15 is not being covered by the up-and-down airflow direction adjusting blade 30 will be taken to be a state where the first portion 16 of the blow-out opening 15 is open.

[0052] In a case where the state of the up-and-down airflow direction adjusting blade 30 is the closed state, as shown in FIG. 9, the up-and-down airflow direction adjusting blade 30 is placed in such a way as to cover the first portion 16 of the blow-out opening 15. For this reason, in a case where the state of the up-and-down airflow direction adjusting blade 30 is the closed state, the first portion 16 of the blow-out opening 15 is shielded by the up-and-down airflow direction adjusting blade 30.

[0053] In a case where the state of the up-and-down airflow direction adjusting blade 30 is the first open state, the up-and-down airflow direction adjusting blade 30 is placed in such a way as to open the first portion 16 of the blow-out opening 15 and in such a way that the air is blown out from the first portion 16 of the blow-out opening 15 toward the front of the indoor unit 10. Specifically, as shown in FIG. 10, the up-and-down airflow direction adjusting blade 30 is placed in such a way as to be substantially parallel to and oppose the first portion 16 of the blow-out opening 15-that is, an open surface corresponding to the first portion 16 in the blow-out opening 15. In other words, supposing that the lengthwise direction of the first portion 16 of the blow-out opening 15 is the "left-and-right direction" and the direction orthogonal to the lengthwise direction of the first portion 16 of the blow-out opening 15 is the "front-and-rear direction", then as shown in FIG. 10 the up-and-down airflow direction adjusting blade 30 is placed in such a way as to not incline, with respect to the left-and-right direction and the front-and-rear direction, with respect to the open surface corresponding to the first portion 16 in the blow-out opening 15.

[0054] In a case where the state of the up-and-down airflow direction adjusting blade 30 is the second open state, the up-and-down airflow direction adjusting blade 30 is placed in such a way as to open the first portion 16 of the blow-out opening 15 and in such a way that the air is blown out from the first portion 16 of the blow-out opening 15 toward the front of the indoor unit 10. Specifically, as shown in FIG. 11, the up-and-down airflow direction adjusting blade 30 is placed in such a way as to incline a predetermined angle with respect to the open surface corresponding to the first portion 16 in the blow-out opening 15. In other words, the up-and-down airflow direction adjusting blade 30 is placed inclined in such a way that the end portion of the up-and-down airflow direction adjusting blade 30 on the side near the rear side in the front-and-rear direction of the first portion 16 of the blow-out opening 15-that is, the end portion (below, called a rear side end portion 30e) including the second long edge 30d of the up-and-down airflow direction adjusting blade 30-becomes nearer with respect to the first portion 16 of the blow-out opening 15 than the end portion (below, called a front side end portion 30f) of the up-and-down airflow direction adjusting blade 30 opposing the rear side end portion 30e. Consequently, in a case where the up-and-down airflow direction adjusting blade 30 is in the second open state, the inside surface 30a of the up-and-down airflow direction adjusting blade 30 is visible in a front view of the indoor unit 10. The aforementioned front side end portion 30f is the end portion of the up-and-down airflow direction adjusting blade 30 on the side near the front side in the front-and-rear direction of the first portion 16 of the blow-out opening 15 and is the end portion including the first long edge 30c of the up-and-down airflow direction adjusting blade 30.

[0055] Further, in a case where the state of the up-and-down airflow direction adjusting blade 30 is the second open state, the up-and-dawn airflow direction adjusting blade 30 is placed inclined in the front-and-rear direction with respect to the open surface corresponding to the first portion 16 in the blow-out opening 15. For this reason, in a case where the state of the up-and-down airflow direction adjusting blade 30 is the second open state, an airflow heading downward of the indoor unit 10 is formed compared to the case where the state of the up-and-down airflow direction adjusting blade 30 is the first open state. For this reason, hereinafter, the direction in which the air that has been blown out from the blow-out opening 15 heads in a case where the state of the up-and-down airflow direction adjusting blade 30 is the second open state will be called frontward-and-downward, and the direction in which the air that has been blown out from the blow-out opening 15 heads in a case where the state of the up-and-down airflow direction adjusting blade 30 is the first open state will be called frontward-and-upward.

[0056] In a case where the state of the up-and-down airflow direction adjusting blade 30 is the third open state, the up-and-down airflow direction adjusting blade 30 is placed in such a way as to open the first portion 16 of the blow-out opening 15 and in such a way that the air is blown out from the first portion 16 of the blow-out opening 15 downward of the indoor unit 10. Specifically, as shown in FIG. 12, the up-and-down airflow direction adjusting blade 30 is placed in such a way as to incline a predetermined angle with respect to the open surface corresponding to the first portion 16 in the blow-out opening 15. More specifically, the up-and-down airflow direction adjusting blade 30 is placed inclined in such a way that the front side end portion 30f of the up-and-down airflow direction adjusting blade 30 becomes nearer to the first portion 16 of the blow-out opening 15 than the rear side end portion 30e of the up-and-down airflow direction adjusting blade 30. For this reason, in a case where the state of the up-and-down airflow direction ad-

justing blade 30 is the third open state, the outside surface 30b of the up-and-down airflow direction adjusting blade 30 is visible in a front view of the indoor unit 10.

<Configuration of Side Shielding Members>

[0057] FIG. 13(a) is a front view of the indoor unit 10 in which the up-and-down airflow direction adjusting blade 30 is in the closed state and the side shielding members 20 and 90 are in a closed state and is a view showing the neighborhood of the left side shielding member 90. FIG. 13(b) is a perspective view of the indoor unit 10 in which the up-and-down airflow direction adjusting blade 30 is in the closed state and the side shielding members 20 and 90 are in the closed state and is a view showing the neighborhood of the left side shielding member 90. FIG. 14(a) is a front view of the indoor unit 10 in which the up-and-down airflow direction adjusting blade 30 is in the second open state and the side shielding members 20 and 90 are in the closed state and is a view showing the neighborhood of the left side shielding member 90. FIG. 14(b) is a perspective view of the indoor unit 10 in which the up-and-down airflow direction adjusting blade 30 is in the second open state and the side shielding members 20 and 90 are in the closed state and is a view showing the neighborhood of the left side shielding member 90. FIG. 15(a) is a front view of the indoor unit 10 in which the up-and-down airflow direction adjusting blade 30 is in the second open state and the side shielding members 20 and 90 are in the open state and is a view showing the neighborhood of the left side shielding member 90. FIG. 15(b) is a perspective view of the indoor unit 10 in which the up-and-down airflow direction adjusting blade 30 is in the second open state and the side shielding members 20 and 90 are in the open state and is a view showing the neighborhood of the left side shielding member 90.

[0058] The side shielding members 20 and 90 are placed in the lower portions of both the left and right sides of the indoor unit 10. Specifically, the side shielding members 20 and 90 are plate-like members whose section in a predetermined direction is substantially L-shaped, and the side shielding members 20 and 90 are capable of covering open portions of the blow-out opening 15 formed from the bottom surface to the side surfaces of the indoor unit casing 12. Further, the side shielding members 20 and 90 are capable of covering portions of the blow-out opening 15 other than the first portion 16 of the blow-out opening 15 that is covered by the up-and-down airflow direction adjusting blade 30.

[0059] Further, the side shielding members 20 and 90 are placed in such a way that, in a state where the side shielding members 20 and 90 and the up-and-down airflow direction adjusting blade 30 are covering the blow-out opening 15, or in other words a case where the airflow direction state of the indoor unit 10 is an operation stop state, parts of the side shielding members 20 and 90 that cover open portions of the blow-out opening 15 formed in the bottom surface of the indoor unit casing 12 and the up-and-down airflow direction adjusting blade 30 are generally continuous in the left-and-right direction in a bottom view of the indoor unit 10.

[0060] Hereinafter, for the convenience of description, of the side shielding members 20 and 90, the side shielding member that is placed in the lower portion on the right side of the indoor unit 10 in a front view of the indoor unit 10 will be called the right side shielding member 20 and the side shielding member that is placed in the lower portion on the left side of the indoor unit 10 in a front view of the indoor unit 10 will be called the left side shielding member 90. Further, the right side shielding member 20 has the same configuration as the configuration of the left side shielding member 90 with which it is bilaterally symmetrical, so here only the configuration of the left side shielding member 90 will be described, and description regarding the configuration of the right side shielding member 20 will be skipped.

[0061] As shown in FIG. 13, FIG. 14, and FIG. 15, the left side shielding member 90 has a curved shape along the corner portion of the lower portion of the indoor unit 10. Further, the left side shielding member 90 has a first portion 91 and a second portion 92. The first portion 91 includes a first end portion 90a of the left side shielding member 90. Further, the second portion 92 includes a second end portion 90b of the left side shielding member 90.

[0062] Further, the side shielding members 20 and 90 are capable of taking two states (an open state and a closed state). Hereinafter, for the convenience of description, the portion of the blow-out opening 15 that is covered by the left side shielding member 90 in a case where the side shielding members 20 and 90 are in the closed state-or in other words the space in the blow-out opening 15 in which the left side shielding member 90 is placed in a case where the side shielding members 20 and 90 are in the closed state-will be called a second portion 17a of the blow-out opening 15, and the portion that is covered by the right side shielding member 20-or in other words the space in the blow-out opening 15 in which the right side shielding member 20 is placed in a case where the side shielding members 20 and 90 are in the closed state-will be called a third portion 17b of the blow-out opening 15.

[0063] In a case where the state of the side shielding members 20 and 90 is the closed state, the side shielding members 20 and 90 are placed in such a way as to cover the second portion 17a and the third portion 17b of the blow-out opening 15 (see FIG. 13). Specifically, in a case where the state of the side shielding members 20 and 90 is the closed state, the right side shielding member 20 is placed in such a way as to cover the third portion 17b of the blow-out opening 15 and the left side shielding member 90 is placed in such a way as to cover the second portion 17a of the blow-out opening 15. For this reason, in a case where the up-and-down airflow direction adjusting blade 30 and the side shielding members 20 and

90 are in the closed state, the blow-out opening 15 is shielded.

[0064] In a case where the state of the side shielding members 20 and 90 is the open state, the side shielding members 20 and 90 are placed in such a way as to open the second portion 17a and the third portion 17b of the blow-out opening 15 (see FIG. 15). Specifically, the right side shielding member 20 is placed in such a way as to open the third portion 17b of the blow-out opening 15 and the left side shielding member 90 is placed in such a way as to open the second portion 17a of the blow-out opening 15.

<Configuration of First Mechanism>

[0065] The first mechanism 50 is a mechanism for moving the up-and-down airflow direction adjusting blade 30 from a state where the first portion 16 of the blow-out opening 15 is being covered to a state where the first portion 16 of the blow-out opening 15 is open. Further, the first mechanism 50 can switch the state of the up-and-down airflow direction adjusting blade 30 by moving the position of the up-and-down airflow direction adjusting blade 30 with respect to the open surface corresponding to the first portion 16 in the blow-out opening 15.

[0066] Further, the first mechanism 50 has push-out mechanisms 51 and 61 and an angle adjusting mechanism 71.

[0067] The push-out mechanisms 51 and 61 can move the first coupling portions 32, which are portions at which the up-and-down airflow direction adjusting blade 30 and the push-out mechanisms 51 and 61 are coupled together, in such a way that the up-and-down airflow direction adjusting blade 30 is pushed out from the neighborhood of the blow-out opening 15. Specifically, the push-out mechanisms 51 and 61 can move the first coupling portions 32 in such a way that the first coupling portions 32 move toward or away from the blow-out opening 15. That is, the push-out mechanisms 51 and 61 can move the first coupling portions 32 in a direction away from the blow-out opening 15.

[0068] Further, the push-out mechanisms 51 and 61 can move the position of the first coupling portions 32 with respect to the first portion 16 of the blow-out opening 15 by moving the first coupling portions 32. For example, the push-out mechanisms 51 and 61 can move the first coupling portions 32 placed in the position shown in FIG. 9 to the position shown in FIG. 10. Further, for example, the push-out mechanisms 51 and 61 can move the first coupling portions 32 placed in the position shown in FIG. 10 to the position shown in FIG. 11. That is, the push-out mechanisms 51 and 61 can move the first coupling portions 32 from a predetermined position to a position differing from the predetermined position by moving the first coupling portions 32. Moreover, the push-out mechanism 51 and 61 can slide the up-and-down airflow direction adjusting blade 30 frontward from the open surface corresponding to the first portion 16 in the blow-out opening 15 by moving the position of the first coupling portions 32 with respect to the first portion 16 of the blow-out opening 15 in a direction away from the blow-out opening 15. The push-out mechanisms 51 and 61 function as acceleration mechanisms that transmit driving force from later-described push-out mechanism drive motors 54 and 64 to the first coupling portions 32 of the up-and-down airflow direction adjusting blade 30.

[0069] Further, as shown in FIG. 7 and FIG. 8, the push-out mechanisms 51 and 61 have a first push-out mechanism 51 and a second push-out mechanism 61. In the present embodiment, the configurations of the first push-out mechanism 51 and the second push-out mechanism 61 are the same, so here description will be given only regarding the configuration of the first push-out mechanism 51, and description regarding the second push-out mechanism 61 will be skipped by reading reference signs in the 50s given to configural parts of the first push-out mechanism 51 as reference signs in the 60s.

[0070] As shown in FIG. 7 and FIG. 8, the first push-out mechanism 51 has a pinion gear 52, a moving member 53, and a push-out mechanism drive motor 54.

[0071] The pinion gear 52 is coupled to a drive shaft 54a that the push-out mechanism drive motor 54 has, and the pinion gear 52 rotates as a result of being driven by the push-out mechanism drive motor 54.

[0072] The moving member 53 has a rack 56, which meshes with the pinion gear 52, and a support shaft 57. The rack 56 is placed from the neighborhood of one end portion 53a to the neighborhood of another end portion 53b of the moving member 53. The support shaft 57 is a rod-like member and projects outward from an end surface in the neighborhood of the end portion 53a of the moving member 53. Moreover, the support shaft 57 is inserted, parallel with respect to the lengthwise direction of the up-and-down airflow direction adjusting blade 30, through the shaft support portion 32a of the up-and-down airflow direction adjusting blade 30 and rotatably supports the up-and-down airflow direction adjusting blade 30.

[0073] The push-out mechanism drive motor 54 is a stepping motor and has the drive shaft 54a. The drive shaft 54a is coupled to the push-out mechanism drive motor 54 and rotates as a result of being driven by the push-out mechanism drive motor 54. For this reason, the push-out mechanism drive motor 54 can rotate the pinion gear 52 by rotating the drive shaft 54a. In the present embodiment, the push-out mechanism drive motor 54 and the pinion gear 52 are placed opposing each other. Further, the push-out mechanism drive motor 54 is fixed to a later-described attachment plate 80.

[0074] Because of this configuration, when the push-out mechanism drive motors 54 and 64 rotate the pinion gears 52 and 62, motive force is transmitted to the racks 56 and 66 meshing with the pinion gears 52 and 62, and the positions of the moving members 53 and 63 with respect to the pinion gears 52 and 62 change. Specifically,

as shown in FIG. 7 and FIG. 8, supposing that the end portions of the moving members 53 and 63 coupled to the up-and-down airflow direction adjusting blade 30 are lower end portions 53a and 63a of the moving members 53 and 63 and that the end portions of the moving members 53 and 63 on the opposite sides of the lower end portions 53a and 63a are upper end portions 53b and 63b of the moving members 53 and 63, the upper end portions 53b and 63b of the moving members 53 and 63 move to positions in the neighborhoods of the pinion gears 52 and 62 or move to positions away from the pinion gears 52 and 62 as a result of being driven by the push-out mechanism drive motors 54 and 64. For this reason, the up-and-down airflow direction adjusting blade 30 coupled to the lower end portions 53a and 63a of the moving members 53 and 63 moves, in accompaniment with the movement of the moving members 53 and 63, in a direction toward the open surface corresponding to the first portion 16 in the blow-out opening 15-that is, a direction in which the up-and-down airflow direction adjusting blade 30 shields the first portion 16 of the blow-out opening 15-or a direction away from the open surface corresponding to the first portion 16 in the blow-out opening 15-that is, a direction in which the up-and-down airflow direction adjusting blade 30 opens the first portion 16 of the blow-out opening 15. In this way, the push-out mechanisms 51 and 61 can adjust the distance from the first portion 16 of the blow-out opening 15 to the first coupling portions 32.

[0075] Because of this, the push-out mechanisms 51 and 61 can slide-that is, push out-they up-and-down airflow direction adjusting blade 30 in such a way that the up-and-down airflow direction adjusting blade 30 is pushed out from the neighborhood of the blow-out opening 15. The amount of rotation and the direction of rotation of the push-out mechanism drive motors 54 and 64 are controlled by a later-described control unit 84.

[0076] The angle adjusting mechanism 71 can move the second coupling portion 33, which is a portion at which the up-and-down airflow direction adjusting blade 30 and the angle adjusting mechanism 71 are coupled together, in a direction away from the blow-out opening 15 in such a way that the angle of inclination of the up-and-down airflow direction adjusting blade 30 with respect to the open surface corresponding to the first portion 16 in the blow-out opening 15 is adjusted. Further, the angle adjusting mechanism 71 can move the second coupling portion 33 placed in a predetermined position with respect to the blow-out opening 15 to a position different from the predetermined position by moving the second coupling portion 33 using the support shafts 57 and 67 supported in the first coupling portions 32 as centers of rotation-that is, rotating shafts.

[0077] The aforementioned push-out mechanisms 51 and 61 can move the support shafts 57 and 67, which function as rotating shafts of the up-and-down airflow direction adjusting blade 30, together with the up-and-down airflow direction adjusting blade 30. In other words, the push-out mechanisms 51 and 61 can move the rotating shafts of the up-and-down airflow direction adjusting blade 30.

[0078] Further, the angle adjusting mechanism 71 functions as a deceleration mechanism that transmits driving force from a later-described angle adjusting mechanism drive motor 73 to the second coupling portion 33 of the up-and-down airflow direction adjusting blade 30.

[0079] The angle adjusting mechanism 71 has an angle adjusting mechanism drive motor 73 and a link mechanism 72.

[0080] The angle adjusting mechanism drive motor 73 has a drive shaft 73a. The angle adjusting mechanism drive motor 73 is a stepping motor and drives the link mechanism 72 via the drive shaft 73a.

[0081] The link mechanism 72 has a swing lever 74 and an arm 75. One end portion of the swing lever 74 is coupled to the drive shaft 73a of the angle adjusting mechanism drive motor 73. Further, the other end portion of the swing lever 74 is rotatably coupled to one end portion of the arm 75.

[0082] Further, the arm 75 includes a support shaft 78. The support shaft 78 projects in outward directions from both end surfaces of the arm 75 in the neighborhood of the end portion on the opposite side of the end portion that is coupled to the swing lever 74. Moreover, the support shaft 78 is engaged with the shaft support portions 33a of the up-and-down airflow direction adjusting blade 30 and rotatably supports the up-and-down airflow direction adjusting blade 30.

[0083] For this reason, in a case where the swing lever 74 of the link mechanism 72 is in the position shown in FIG. 9, the up-and-down airflow direction adjusting blade 30 is in a state where it is shielding the first portion 16 of the blow-out opening 15. Further, in a case where the swing lever 74 is in the position shown in FIG. 10 or FIG. 11, the state of the up-and-down airflow direction adjusting blade 30 becomes the first open state or the second open state. Moreover, in a case where the swing lever 74 is in the position shown in FIG. 12, the state of the up-and-down airflow direction adjusting blade 30 becomes the third open state. In this way, the angle adjusting mechanism 71 can adjust the distance from the first portion 16 of the blow-out opening 15 to the second coupling portion 33.

[0084] The aforementioned push-out mechanisms 51 and 61 move the first coupling portions 32 using the support shaft 78 as a center of rotation-that is, a rotating shaft-in the case of switching the state of the up-and-down airflow direction adjusting blade 30 from the first open state to the second open state. For this reason, in a case where the state of the up-and-down airflow direction adjusting blade 30 switches from the first open state to the second open state, the position of the support shaft 78-that is, the position of the second coupling portion 33-with respect to the first portion 16 of the blow-out opening 15 is not moved by the angle adjusting mechanism 71.

[0085] Because of this configuration, the angle adjusting mechanism 71 can push and pull the second coupling portion 33 of the up-and-down airflow direction adjusting blade 30 as a result of being driven by the angle adjusting mechanism drive motor 73. The angle of rotation of the link mechanism 72-that is, the amount of rotation and the direction of rotation of the angle adjusting mechanism drive motor 73-is controlled by the later-described control unit 84.

[0086] In this way, the angle of inclination of the up-and-down airflow direction adjusting blade 30 with respect to the open surface corresponding to the first portion 16 in the blow-out opening 15 is changed as a result of the distance from the first portion 16 of the blow-out opening 15 to the first coupling portions 32 being adjusted by the push-out mechanisms 51 and 61 and the distance from the first portion 16 of the blow-out opening 15 to the second coupling portion 33 being adjusted by the angle adjusting mechanism 71. Further, in a case where the up-and-down airflow direction adjusting blade 30 switches from the first open state to the second open state, the push-out mechanisms 51 and 61 move the first coupling portions 32 using the support shaft 78 supported in the second coupling portion 33 as a rotating shaft. Moreover, in a case where the up-and-down airflow direction adjusting blade 30 switches from the second open state to the third open state, the angle adjusting mechanism 71 moves the second coupling portion 33 using the support shafts 57 and 67 supported in the first coupling portions 32 as rotating shafts. For this reason, the angle of inclination of the up-and-down airflow direction adjusting blade 30 with respect to the first portion 16 of the blow-out opening 15 is changed by using as a rotating shaft (s) the support shaft(s) supported in either one of the first coupling portions 32 in the neighborhood of the front side end portion 30f of the up-and-down airflow direction adjusting blade 30 and the second coupling portion 33 in the neighborhood of the rear side end portion 30e and moving the coupling portion(s) supporting the support shaft(s) not functioning as a rotating shaft(s).

[0087] Further, the first mechanism 50 has an attachment plate 80. The attachment plate 80 is placed more upward than the open surface corresponding to the first portion 16 in the blow-out opening 15. Further, the two push-out mechanism drive motors 54 and 64 that are the drive sources of the push-out mechanisms 51 and 61 and the angle adjusting mechanism drive motor 73 that is the drive source of the angle adjusting mechanism 71 are fixed to the upper surface of the attachment plate 80. Specifically, the push-out mechanism drive motors 54 and 64 are fixed in the neighborhoods of both end portions of the attachment plate 80. Further, the angle adjusting mechanism drive motor 73 is fixed to the substantial center portion of the attachment plate 80. In this way, the push-out mechanism drive motors 54 and 64 and the angle adjusting mechanism drive motor 73 are stored inside the indoor unit casing 12 together with the attachment plate 80.

[0088] Further, moving member insertion openings 81a and 81b through which the moving members 53 and 63 are insertable are formed in the attachment plate 80 in the neighborhoods of the push-out mechanism drive motors 54 and 64. The moving member insertion openings 81a and 81b are formed in such a way that parts thereof become narrower so that they can support portions of the moving members 53 and 63 other than the racks 56 and 66. Moreover, as shown in FIG. 7 and FIG. 8, guide grooves 82a and 82b for guiding the moving members 53 and 63 are disposed in the attachment plate 80.

[0089] Further, a lever insertion opening 83 through which the swing lever 74 is insertable is farmed in the attachment plate 80 in the neighborhood of the angle adjusting mechanism drive motor 73.

[0090] In the present embodiment, the push-out mechanisms 51 and 61 are acceleration mechanisms and the angle adjusting mechanism 71 is a deceleration mechanism, so the required drive torques and the non-energized holding torques of the two push-out mechanism drive motors 54 and 64 and the angle adjusting mechanism drive motor 73 can be adjusted. Consequently, for example, even in a case where the position of the up-and-down airflow direction adjusting blade 30 has been manually moved, the torques acting on the push-out mechanism drive motors 54 and 64 and the angle adjusting mechanism drive motor 73 can be brought closer to each other, so the same stepping motors can be employed.

<Configuration of Second Mechanisms>

[0091] FIG. 16(a) is a sectional view of the indoor unit 10 in which the up-and-down airflow direction adjusting blade 30 is in the second open state and the side shielding members 20 and 90 are in the closed state and is a schematic view of the neighborhood of the left side shielding member 90. FIG. 15(b) is a sectional view of the indoor unit 10 in which the up-and-down airflow direction adjusting blade 30 is in the second open state and the side shielding members 20 and 90 are in the open state and is a schematic view of the neighborhood of the left side shielding member 90.

[0092] The second mechanisms 29 and 99 are moving mechanisms different from the first mechanism 50 and are mechanisms capable of moving the side shielding members 20 and 90 from a state where the second portion 17a and the third portion 17b of the blow-out opening 15 are being shielded to a state where the second portion 17a and the third portion 17b of the blow-out opening 15 are open. In other words, the second mechanisms 29 and 99 are mechanisms for moving the side shielding members 20 and 90 in order to switch the state of the side shielding members 20 and 90.

[0093] The second mechanisms 29 and 99 are equipped with second mechanism drive motors 24 and 94 (see FIG. 17) and support members (93; see FIG. 16).

Further, the second mechanisms 29 and 99 have a right side shielding member moving mechanism 29 for switching the state of the right side shielding member 20 and a left side shielding member moving mechanism 99 for switching the state of the left side shielding member 90. Further, the right side shielding member moving mechanism 29 has the same configuration as the configuration of the left side shielding member moving mechanism 99 with which it is bilaterally symmetrical, so here only the configuration of the left side shielding member moving mechanism 99 will be described, and description regarding the configuration of the right side shielding member moving mechanism 29 will be skipped.

[0094] The second mechanism drive motor 94 is placed inside the indoor unit body 11 and is fixed to the indoor unit casing 12. Further, the second mechanism drive motor 94 has a rotating shaft (not shown in the drawings). The rotating shaft extends in the front-and-rear direction of the indoor unit 10 and rotates as a result of being driven by the second mechanism drive motor 94.

[0095] As shown in FIG. 16, the support member 93 is a plate-like member, and one end portion 93a thereof is coupled to the neighborhood of the first end portion 90a of the left side shielding member 90. Another end portion 93b of the support member 93 is coupled to the rotating shaft, and the support member 93 moves in a direction of rotation about the rotating shaft as a result of the rotating shaft rotating.

[0096] Because of this configuration, the second mechanisms 29 and 99 are such that the rotating shafts rotate as a result of being driven by the second mechanism drive motors 24 and 94, and the support members move in the directions of rotation as a result of the rotating shafts rotating. Further, the side shielding members 20 and 90 move in the directions of rotation about the rotating shafts as a result of the support members moving in the directions of rotation. For this reason, the side shielding members 20 and 90 can shield and open the second portion 17a and the third portion 17b of the blow-out opening 15 by moving in such a way as to draw circular arcs. The driving of the second mechanism drive motors 24 and 94 is controlled by the later-described control unit 84.

[0097] Further, the second mechanisms 29 and 99 are equipped with storing portions 25 and 95 for storing the side shielding members 20 and 90 in the open state. The storing portion 25 is placed in the neighborhood of the third portion 17b of the blow-out opening 15 in the blow-out flow path. Further, the storing portion 95 is placed in the neighborhood of the second portion 17a of the blow-out opening 15 in the blow-out flow path. For this reason, the blow-out flow path is divided at its lower portion into three flow paths by the storing portions 25 and 95. Here, for the convenience of description, in the blow-out flow path, the flow path portion whose inlet is defined by the upper end portions of the two storing portions 25 and 95 and whose outlet is the first portion 16 of the blow-out opening 15 will be called a main blow-out flow path B. Further, in the blow-out flow path, the flow path portion in whose inlet the upper end portion of the storing portion 25 is positioned and whose outlet is the third portion 17b of the blow-out opening 15 will be called a right side blow-out flow path D. Further, in the blow-out flow path, the flow path portion in whose inlet the upper end portion of the storing portion 95 is positioned and whose outlet is the second portion 17a of the blow-out opening 15 will be called a left side blow-out flow path C. That is, the storing portion 25 is placed between the main blow-out flow path B and the right side blow-out flow path D, and the storing portion 95 is placed between the main blow-out flow path B and the left side blow-out flow path C. Further, the outlets of the blow-out flow paths are blocked by the up-and-down airflow direction adjusting blade 30, the left side shielding member 90, and the right side shielding member 20. Specifically, the outlet of the main blow-out flow path B is blocked by the up-and-down airflow direction adjusting blade 30, the outlet of the left side blow-out flow path C is blocked by the left side shielding member 90, and the outlet of the right side blow-out flow path D is blocked by the right side shielding member 20.

[0098] Further, the storing portions 25 and 95 have first wall portions 26 and 96 and second wall portions 27 and 97 that form storage spaces in which the side shielding members 20 and 90 in the open state are stored. The first wall portions 26 and 96 extend upward from the neighborhood of the second portion 17a or the neighborhood of the third portion 17b of the blow-out opening 15. Further, the first wall portions 26 and 96 have curved shapes so as to be capable of accommodating the side shielding members 20 and 90 and are placed inclined in such a way that upper end portions (96a; see FIG. 16) of the first wall portions 26 and 96 become nearer to the center side of the indoor unit body 11 than lower end portions (96b; see FIG. 16) of the first wall portions 26 and 96.

[0099] Further, the second wall portions 27 and 97 extend upward from the neighborhood of the boundary between the first portion 16 of the blow-out opening 15 and the second portion 17a of the blow-out opening 15 or the neighborhood of the boundary between the first portion 16 of the blow-out opening 15 and the third portion 17b of the blow-out opening 15. Further, the second wall portions 27 and 97 have curved shapes so as to be capable of accommodating the side shielding members 20 and 90 and are placed inclined in such a way that upper end portions (97a; see FIG. 16) of the second wall portions 27 and 97 become nearer to the center side of the indoor unit body 11 than lower end portions (97b; see FIG. 16) of the second wall portions 27 and 97. Moreover, the upper end portions of the storing portions 25 and 95-that is, the upper end portions (97a; see FIG. 16) of the second wall portions 27 and 97 and the upper end portions (96a; see FIG. 16) of the first wall portions 26 and 96-have continuous configurations.

[0100] The perpendicular blades 19 are placed more in the neighborhood of the indoor fan 14 than the upper end portions of the storing portions 25 and 95 in the blow-

out flow path. Further, the storing portions 25 and 95 are placed in such a way that the distal end portions of the blades that the side perpendicular blade portions 19d and 19e have are positioned in the neighborhoods of the upper end portions of the storing portions 25 and 95 when the blades that the side perpendicular blade portions 19d and 10e have swing and take an inclined state (see FIG. 4). For this reason, in a case where an airflow has been generated by the indoor fan 14 when the perpendicular blades 19 are in the state shown in FIG. 4, the conditioned air is guided to the left side blow-out flow path C and the right side blow-out flow path D.

[0101] Further, in a case where the side shielding members 20 and 90 are in the open state, the side shielding members 20 and 90 do not have an effect on the airflows blown out from the second portion 17a of the blow-out opening 15 and the third portion 17b of the blow-out opening 15 because the side shielding members 20 and 90 are stored in the storage spaces. Consequently, the conditioned air that has been guided by the perpendicular blades 19 to the inlets of the left side blow-out flow path C and the right side blow-out flow path D flows through the left side blow-out flow path C and the right side blow-out flow path D along guide surfaces (96c; see FIG. 16) of the first wall portions 26 and 96 inclined toward the left side or the right side-or in other words, the conditioned air is regulated by the guide surfaces of the first wall portions 26 and 96-and is blown out from the outlets of the left side blow-out flow path C and the right side blow-out flow path D. Further, the outlets of the left side blow-out flow path C and the right side blow-out flow path D open toward the sides of the indoor unit 10, so the air blown out from the outlets of the left side blow-out flow path C and the right side blow-out flow path D flows toward both the left and right sides of the indoor unit 10.

[0102] In FIG. 16(b), the distal end portion of the blade that the left side perpendicular blade portion 19d has is not depicted as being positioned in the neighborhood of the inlet of the left side blow-out flow path C, but in actuality the distal end portion of the blade that the left side perpendicular blade portion 19d has is positioned in the neighborhood of the inlet of the left side blow-out flow path C in a case where the state of the left side shielding member 90 has become the open state.

[0103] Further, in the present embodiment, as for the blades that the side perpendicular blade portions 19d and 19e have, the distal end portions thereof are placed in the neighborhoods of the inlets of the left side blow-out flow path C or the right side blow-out flow path D only in a case where the state of the side shielding members 20 and 90 is the open state, and the distal end portions thereof are placed in positions away from the neighborhoods of the inlets of the left side blow-out flow path C or the right side blow-out flow path D in a case where the state of the side shielding members 20 and 90 is the closed state. For this reason, in the present embodiment, the indoor unit 10 has a configuration where, in a case where the side shielding members 20 and 90 are in the closed state, the side perpendicular blade portions 19d and 19e do not guide the conditioned air to the left side blow-out flow path C or the right side blow-out flow path D and do not cover the inlets of the left side blow-out flow path C or the right side blow-out flow path D.

<Control Unit>

[0104] FIG. 17 is a control block diagram of the control unit 84 with which the air conditioner 1 is equipped.

[0105] As shown in FIG. 17, the control unit 84 is connected to the various types of devices of the indoor unit 10 and the outdoor unit 2 and can perform operation control of the various types of devices according to operating modes such as the cooling operation and the heating operation on the basis of operation commands from an air conditioning subject via a remote controller 86.

[0106] Further, plural switches such as an operation stop button and an airflow direction setting button 86a are disposed on the remote controller 86. The operation stop button is a switch that is operated when the operation of the air conditioner 1 is stopped by the air conditioning subject. Further, the airflow direction setting button 86a is a switch that is operated when the blow-out direction of the air blown out from the indoor unit 10 is set by the air conditioning subject. For example, when the airflow direction setting button 86a is pushed by the air conditioning subject, the control unit 84 receives, as control signals, airflow direction setting commands from the air conditioning subject. The airflow direction setting commands in the present embodiment include a first command, which is a command for setting the blow-out direction of the air in such a way that the conditioned air is blown out to the sides of the indoor unit 10, and a second command, which is a command for setting the blow-out direction of the air in such a way that the conditioned air is mainly blown out frontward-and-upward and to the sides of the indoor unit 10.

[0107] Further, the control unit 84 has a drive control unit 85 for switching the states of the up-and-down airflow direction adjusting blade 30 and the side shielding members 20 and 90. The drive control unit 85 can drive the push-out mechanisms 51 and 61 and the angle adjusting mechanism 71 at arbitrary timings. Specifically, the drive control unit 85 switches the state of the up-and-down airflow direction adjusting blade 30 by controlling the numbers of rotations and the directions of rotation of the two push-out mechanism drive motors 54 and 64 and the angle adjusting mechanism drive motor 73. Moreover, the drive control unit 85 switches the state of the side shielding members 20 and 90 by controlling the numbers of rotations and the directions of rotation of the two second mechanism drive motors 24 and 94. Further, the drive control unit 85 is capable of executing a push-out mechanism drive mode (which corresponds to a first drive mode) in which the drive control unit 85 drives only the push-out mechanisms 51 and 61 by controlling only the two push-out mechanism drive motors 54 and 64, an

angle adjusting mechanism drive mode (which corresponds to a second drive mode) in which the drive control unit 85 drives only the angle adjusting mechanism 71 by controlling only the angle adjusting mechanism drive motor 73, and a simultaneous drive mode in which the drive control unit 85 simultaneously drives the push-out mechanisms 51 and 61 and the angle adjusting mechanism 71 by simultaneously controlling the two push-out mechanism drive motors 54 and 64 and the angle adjusting mechanism drive motor 73. For that reason, the control unit 84 can change the airflow direction state of the indoor unit 10 in accordance with the operating modes or the airflow direction setting commands from the air conditioning subject. Further, in the present embodiment, the indoor unit 10 is capable of taking six airflow direction states: an operation stop state, a first cooling state, a second cooling state, a first heating state, a second heating state, and a three-way airflow direction state.

[0108] In a case where the airflow direction state of the indoor unit 10 is the operation stop state, the up-and-down airflow direction adjusting blade 30 and the side shielding members 20 and 90 all take the closed state. Further, in a case where the airflow direction state of the indoor unit 10 is the first cooling state, the up-and-down airflow direction adjusting blade 30 takes the second open state and the side shielding members 20 and 90 take the closed state. In a case where the airflow direction state of the indoor unit 10 is the second cooling state, the up-and-down airflow direction adjusting blade 30 takes the second open state and the side shielding members 20 and 90 take the open state. In a case where the airflow direction state of the indoor unit 10 is the first heating state, the up-and-down airflow direction adjusting blade 30 takes the third open state and the side shielding members 20 and 90 take the closed state. In a case where the airflow direction state of the indoor unit 10 is the second heating state, the up-and-down airflow direction adjusting blade 30 takes the third open state and the side shielding members 20 and 90 take the open state. In a case where the airflow direction state of the indoor unit 10 is the three-way airflow direction state, the up-and-down airflow direction adjusting blade 30 takes the first open state and the side shielding members 20 and 90 take the open state.

[0109] For example, when a command to start the cooling operation is given via the remote controller 86 from the air conditioning subject in a state where the operation of the air conditioner 1 is stopped, that is, in a case where the airflow direction state of the indoor unit 10 is the operation stop state, the drive control unit 85 controls the first mechanism 50 in such a way that the airflow direction state of the indoor unit 10 becomes the first cooling airflow direction state. Specifically, the drive control unit 85 executes the simultaneous drive mode. More specifically, the drive control unit 85 switches the state of the up-and-down airflow direction adjusting blade 30 from the closed state to the first open state by simultaneously controlling the push-out mechanism drive motors 54 and 64 and the angle adjusting mechanism drive motor 73. Additionally, after the state of the up-and-down airflow direction adjusting blade 30 switches to the first open state, the drive control unit 85 executes the push-out mechanism drive mode. Specifically, the drive control unit 85 switches the up-and-down airflow direction adjusting blade 30 from the first open state to the second open state by controlling the push-out mechanism drive motors 54 and 64. At this time, the drive control unit 85 does not perform control to drive the second mechanism drive motors 24 and 94, so the side shielding members 20 and 90 are placed in such a way as to cover the second portion 17a and the third portion 17b of the blow-out opening 15, and the state where the second portion 17a and the third portion 17b of the blow-out opening 15 are shielded is maintained. For this reason, only the first portion 16 of the blow-out opening 15 is opened.

[0110] Further, at this time, the control unit 84 controls the drive motors in such a way that the perpendicular blades 19 stop in a perpendicular state with respect to the lengthwise direction of the indoor unit casing 12. For this reason, the conditioned air is guided by the perpendicular blades 19 only to the main blow-out flow path B and is not guided to the left side blow-out flow path C and the right side blow-out flow path D.

[0111] For this reason, when a command to start the cooling operation is given via the remote controller 86 from the air conditioning subject in a state where the operation of the air conditioner 1 is stopped and an airflow is generated by the indoor fan 14, the conditioned air flows through the main blow-out flow path B and reaches the first portion 16 of the blow-out opening 15. Additionally, the conditioned air that has reached the first portion 16 of the blow-out opening 15 is blown out frontward-and-downward of the indoor unit 10 along the inside surface 30a of the up-and-down airflow direction adjusting blade 30 that is inclined (see FIG 14).

[0112] Because of this, the blow-out direction of the air blown out from the blow-out opening 15 becomes frontward-and-downward of the indoor unit 10, so in a case where the room space in which the indoor unit 10 is installed is divided into a first space that is a space on the front side of the indoor unit 10 and a second space that is a space on the rear side of the first space, the conditioned air is mainly blown out to the lower portion of the first space of the room space.

[0113] Further, when the first command of the airflow direction setting commands is given from the air conditioning subject via the remote controller 86 while the cooling operation in which the airflow direction state of the indoor unit 10 is the first cooling state is being executed in the air conditioner 1, the drive control unit 85 controls the second mechanisms 29 and 99 in such a way that the airflow direction state of the indoor unit 10 switches from the first cooling state to the second cooling airflow direction state. Specifically, the drive control unit 85 controls the second mechanism drive motors 24 and 94 in such a way that the state of the side shielding members

20 and 90 switches from the closed state to the open state. At this time, the state of the up-and-down airflow direction adjusting blade 30 is maintained in the second open state. For this reason, the first portion 16, the second portion 17a, and the third portion 17b of the blow-out opening 15 are opened.

[0114] Further, at this time, the control unit 84 controls the drive motors in such a way that the main perpendicular blade portions 19c of the perpendicular blades 19 stop in a perpendicular state with respect to the lengthwise direction of the indoor unit casing 12. Further, the control unit 84 controls the drive motors in such a way that the distal end portion of the left side perpendicular blade portion 19d is positioned in the neighborhood of the upper end portion of the storing portion 95 and the distal end portion of the right side perpendicular blade portion 19e is positioned in the neighborhood of the upper end portion of the storing portion 25. For this reason, the conditioned air is guided by the perpendicular blades 19 to the main blow-out flow path B, the left side blow-out flow path C, and the right side blow-out flow path D. Consequently, the conditioned air flowing through the main blow-out flow path B reaches the first portion 16 of the blow-out opening 15, the conditioned air flowing through the left side blow-out flow path C reaches the second portion 17a of the blow-out opening 15, and the conditioned air flowing through the right side blow-out flow path D reaches the third portion 17b of the blow-out opening 15 (see FIG. 15).

[0115] Additionally, the conditioned air that has reached the first portion 16 of the blow-out opening 15 is blown out frontward-and-downward of the indoor unit 10 along the inside surface 30a of the up-and-down airflow direction adjusting blade 30 that is inclined.

[0116] Further, the conditioned air flowing through the left side blow-out flow path C is blown out along the guide surface 96c of the first wall portion 96 of the storing portion 95 toward the left side of the indoor unit 10 from the second portion 17a of the blow-out opening 15 that is open. Moreover, the conditioned air flowing through the right side blow-out flow path D is blown out along the guide surface of the first wall portion 26 of the storing portion 25 toward the right side of the indoor unit 10 from the third portion 17b of the blow-out opening 15 that is open.

[0117] Consequently, when the first command of the airflow direction setting commands is given from the air conditioning subject via the remote controller 86 while the cooling operation is being executed in the air conditioner 1, the blow-out direction of the air blown-out from the blow-out opening 15 is changed to frontward-and-downward and both the left and right sides of the indoor unit 10.

[0118] Because of this, the blow-out direction of the air blown out from the blow-out opening 15 becomes frontward-and-downward and both the left and right sides of the indoor unit 10, so in a case where the spaces on both sides of the indoor unit 10 are particularly side portions of the second space, the conditioned air is mainly blown out to the lower portion of the first space and the side portions of the second space of the room space.

[0119] Further, when the second command of the airflow direction setting commands is given from the air conditioning subject via the remote controller 86 while the cooling operation in which the airflow direction state of the indoor unit 10 is the first cooling state is being executed in the air conditioner 1, the drive control unit 85 controls the first mechanism 50 and the second mechanisms 29 and 99 in such a way that the airflow direction state of the indoor unit 10 switches from the first cooling state to the three-way airflow direction state. Specifically, the drive control unit 85 executes the push-out mechanism drive mode. More specifically, the drive control unit 85 switches the state of the up-and-down airflow direction adjusting blade 30 from the second open state to the first open state by controlling the push-out mechanism drive motors 54 and 64. Further, at this time, the drive control unit 85 switches the state of the side shielding members 20 and 90 from the closed state to the open state by controlling the second mechanism drive motors 24 and 94. For this reason, the first portion 16, the second portion 17a, and the third portion 17b of the blow-out opening 15 are opened.

[0120] Further, at this time, the control unit 84 controls the drive motors in such a way that the main perpendicular blade portions 19c of the perpendicular blades 19 stop in a perpendicular state with respect to the lengthwise direction of the indoor unit casing 12. Further, the control unit 84 controls the drive motors in such a way that the distal end portion of the left side perpendicular blade portion 19d is positioned in the neighborhood of the upper end portion of the storing portion 95 and the distal end portion of the right side perpendicular blade portion 19e is positioned in the neighborhood of the upper end portion of the storing portion 25. For this reason, the conditioned air is guided by the perpendicular blades 19 to the main blow-out flow path B, the left side blow-out flow path C, and the right side blow-out flow path D. Consequently, the conditioned air flowing through the main blow-out flow path B reaches the first portion 16 of the blow-out opening 15, the conditioned air flowing through the left side blow-out flow path C reaches the second portion 17a of the blow-out opening 15, and the conditioned air flowing through the right side blow-out flow path D reaches the third portion 17b of the blow-out opening 15.

[0121] Additionally, the conditioned air that has reached the first portion 16 of the blow-out opening 15 is blown out frontward-and-upward of the indoor unit 10 along the inside surface 30a of the up-and-down airflow direction adjusting blade 30 that is placed in such a way as to become substantially parallel to the open surface corresponding to the first portion 16 in the blow-out opening 15.

[0122] Further, the conditioned air flowing through the left side blow-out flow path C is blown out along the guide surface 96c of the first wall portion 96 of the storing portion

95 toward the left side of the indoor unit 10 from the second portion 17a of the blow-out opening 15 that is open. Moreover, the conditioned air flowing through the right side blow-out flow path D is blown out along the guide surface of the first wall portion 26 of the storing portion 25 toward the right side of the indoor unit 10 from the third portion 17b of the blow-out opening 15 that is open.

[0123] Consequently, when the second command of the airflow direction setting commands is given from the air conditioning subject via the remote controller 86 while the cooling operation is being executed in the air conditioner 1, the blow-out direction of the air blown-out from the blow-out opening 15 is changed to frontward-and-upward and both the left and right sides of the indoor unit 10.

[0124] Because of this, the blow-out direction of the air blown out from the blow-out opening 15 becomes frontward-and-upward and both the left and right sides of the indoor unit 10, so the conditioned air is mainly blown out to the upper portion of the first space and the side portions of the second space of the room space.

[0125] Further, for example, when a command to start the heating operation is given via the remote controller 86 from the air conditioning subject in a state where the operation of the air conditioner 1 is stopped, the drive control unit 85 controls the first mechanism 50 in such a way that the airflow direction state of the indoor unit 10 becomes the first heating airflow direction state. Specifically, the drive control unit 85 executes the simultaneous drive mode. More specifically, the drive control unit 85 switches the state of the up-and-down airflow direction adjusting blade 30 from the closed state to the first open state by simultaneously controlling the push-out mechanism drive motors 54 and 64 and the angle adjusting mechanism drive motor 73. Next, when the state of the up-and-down airflow direction adjusting blade 30 switches to the first open state, the drive control unit 85 executes the push-out mechanism drive mode. Specifically, the drive control unit 85 switches the state of the up-and-down airflow direction adjusting blade 30 from the first open state to the second open state by further controlling the push-out mechanism drive motors 54 and 64. Additionally, when the state of the up-and-down airflow direction adjusting blade 30 switches to the second open state, the drive control unit 85 executes the angle adjusting mechanism drive mode. Specifically, the drive control unit 85 switches the state of the up-and-down airflow direction adjusting blade 30 from the second open state to the third open state by further controlling the angle adjusting mechanism drive motor 73. At this time, the drive control unit 85 does not perform control to drive the second mechanism drive motors 24 and 94, so the side shielding members 20 and 90 are placed in such a way as to cover the second portion 17a and the third portion 17b of the blow-out opening 15, and the state where the second portion 17a and the third portion 17b of the blow-out opening 15 are shielded is maintained. For this reason, only the first portion 16 of the blow-out opening 15 is opened.

[0126] Further, at this time, the control unit 84 controls the drive motors in such a way that the perpendicular blades 19 stop in a perpendicular state with respect to the lengthwise direction of the indoor unit casing 12. For this reason, the conditioned air is guided by the perpendicular blades 19 only to the main blow-out flow path B and is not guided to the left side blow-out flow path C and the right side blow-out flow path D.

[0127] For this reason, when a command to start the heating operation is given via the remote controller 86 from the air conditioning subject in a state where the operation of the air conditioner 1 is stopped and an airflow is generated by the indoor fan 14, the conditioned air flows through the main blow-out flow path B and reaches the first portion 16 of the blow-out opening 15. Additionally, the conditioned air that has reached the first portion 16 of the blow-out opening 15 is blown out downward of the indoor unit 10 along the inside surface 30a of the up-and-down airflow direction adjusting blade 30 that is inclined.

[0128] Because of this, the blow-out direction of the air blown out from the blow-out opening 15 becomes downward of the indoor unit 10, so in a case where the space below the indoor unit 10 is particularly the lower portion of the second space, the conditioned air is mainly blown out to the lower portion of the second space of the room space.

[0129] Further, when the first command of the airflow direction setting commands is given from the air conditioning subject via the remote controller 86 while the heating operation in a case where the airflow direction state of the indoor unit 10 is the first heating state is being executed in the air conditioner 1, the drive control unit 85 controls the second mechanisms 29 and 99 in such a way that the airflow direction state of the indoor unit 10 switches from the first heating state to the second heating airflow direction state. Specifically, the drive control unit 85 controls the second mechanism drive motors 24 and 94 in such a way that the state of the side shielding members 20 and 90 switches from the closed state to the open state. At this time, the state of the up-and-down airflow direction adjusting blade 30 is maintained in the third open state. For this reason, the first portion 16, the second portion 17a, and the third portion 17b of the blow-out opening 15 are opened.

[0130] Further, at this time, the control unit 84 controls the drive motors in such a way that the main perpendicular blade portions 19c of the perpendicular blades 19 stop in a perpendicular state with respect to the lengthwise direction of the indoor unit casing 12. Further, the control unit 84 controls the drive motors in such a way that the distal end portion of the left side perpendicular blade portion 19d is positioned in the neighborhood of the upper end portion of the storing portion 95 and the distal end portion of the right side perpendicular blade portion 19e is positioned in the neighborhood of the upper end portion of the storing portion 25. For this reason, the

conditioned air is guided by the perpendicular blades 19 to the main blow-out flow path B, the left side blow-out flow path C, and the right side blow-out flow path D. Consequently, the conditioned air flowing through the main blow-out flow path B reaches the first portion 16 of the blow-out opening 15, the conditioned air flowing through the left side blow-out flow path C reaches the second portion 17a of the blow-out opening 15, and the conditioned air flowing through the right side blow-out flow path D reaches the third portion 17b of the blow-out opening 15.

[0131] Additionally, the conditioned air that has reached the first portion 16 of the blow-out opening 15 is blown out downward of the indoor unit 10 along the inside surface 30a of the up-and-down airflow direction adjusting blade 30 that is inclined.

[0132] Further, the conditioned air flowing through the left side blow-out flow path C is blown out along the guide surface 96c of the first wall portion 96 of the storing portion 95 toward the left side of the indoor unit 10 from the second portion 17a of the blow-out opening 15 that is open. Moreover, the conditioned air flowing through the right side blow-out flow path D is blown out along the guide surface of the first wall portion 26 of the storing portion 25 toward the right side of the indoor unit 10 from the third portion 17b of the blow-out opening 15 that is open.

[0133] Consequently, when the first command of the airflow direction setting commands is given from the air conditioning subject via the remote controller 86 while the heating operation is being executed in the air conditioner 1, the blow-out direction of the air blown-out from the blow-out opening 15 is changed to downward and both the left and right sides of the indoor unit 10.

[0134] Because of this, the blow-out direction of the air blown out from the blow-out opening 15 becomes downward and both the left and right sides of the indoor unit 10, so the conditioned air is mainly blown out to the lower portion and the side portions of the second space of the room space.

[0135] Further, when the second command of the airflow direction setting commands is given from the air conditioning subject via the remote controller 86 while the heating operation in a case where the airflow direction state of the indoor unit 10 is the first heating state is being executed in the air conditioner 1, the drive control unit 85 controls the first mechanism 50 and the second mechanisms 29 and 99 in such a way that the airflow direction state of the indoor unit 10 switches from the first heating state to the three-way airflow direction state. Specifically, the drive control unit 85 first executes the angle adjusting mechanism drive mode. More specifically, the drive control unit 85 switches the state of the up-and-down airflow direction adjusting blade 30 from the third open state to the second open state by controlling the angle adjusting mechanism drive motor 73. Next, the drive control unit 85 executes the push-out mechanism drive mode. Specifically, the drive control unit 85 switches the state of the up-and-down airflow direction adjusting blade 30 from the second open state to the first open state by controlling the push-out mechanism drive motors 54 and 64. In this way, the drive control unit 85 switches the state of the up-and-down airflow direction adjusting blade 30 from the third open state to the first open state. At this time, the drive control unit 85 switches the state of the side shielding members 20 and 90 from the closed state to the open state by controlling the second mechanism drive motors 24 and 94. For this reason, the first portions 16, the second portion 17a, and the third portion 17b of the blow-out opening 15 are opened.

[0136] Further, at this time, the control unit 84 controls the drive motors in such a way that the main perpendicular blade portions 19c of the perpendicular blades 19 stop in a perpendicular state with respect to the lengthwise direction of the indoor unit casing 12. Further, the control unit 84 controls the drive motors in such a way that the distal end portion of the left side perpendicular blade portion 19d is positioned in the neighborhood of the upper end portion of the storing portion 95 and the distal end portion of the right side perpendicular blade portion 19e is positioned in the neighborhood of the upper end portion of the storing portion 25. For this reason, the conditioned air is guided by the perpendicular blades 19 to the main blow-out flow path B, the left side blow-out flow path C, and the right side blow-out flow path D. Consequently, the conditioned air flowing through the main blow-out flow path B reaches the first portion 16 of the blow-out opening 15, the conditioned air flowing through the left side blow-out flow path C reaches the second portion 17a of the blow-out opening 15, and the conditioned air flowing through the right side blow-out flow path D reaches the third portion 17b of the blow-out opening 15.

[0137] Additionally, the conditioned air that has reached the first portion 16 of the blow-out opening 15 is blown out frontward-and-upward of the indoor unit 10 along the inside surface 30a of the up-and-down airflow direction adjusting blade 30 that is placed in such a way as to become substantially parallel to the open surface corresponding to the first portion 16 in the blow-out opening 15.

[0138] Further, the conditioned air flowing through the left side blow-out flow path C is blown out along the guide surface 96c of the first wall portion 96 of the storing portion 95 toward the left side of the indoor unit 10 from the second portion 17a of the blow-out opening 15 that is open. Moreover, the conditioned air flowing through the right side blow-out flow path D is blown out along the guide surface of the first wall portion 26 of the storing portion 25 toward the right side of the indoor unit 10 from the third portion 17b of the blow-out opening 15 that is open.

[0139] Consequently, when the second command of the airflow direction setting commands is given from the air conditioning subject via the remote controller 86 while the heating operation is being executed in the air conditioner 1, the blow-out direction of the air blown-out from the blow-out opening 15 is changed to frontward-and-

upward and both the left and right sides of the indoor unit 10.

[0140] Because of this, the blow-out direction of the air blown out from the blow-out opening 15 becomes frontward-and-upward and both the left and right sides of the indoor unit 10, so the conditioned air is mainly blown out to the upper portion of the first space and the side portions of the second space of the room space.

[0141] Further, when an operation stop command is given via the remote controller 86 from the air conditioning subject in a state where the heating operation or the cooling operation is being executed in the air conditioner 1, the drive control unit 85 controls the first mechanism 50 and/or the second mechanisms 29 and 99 in such a way that the airflow direction state of the indoor unit 10 becomes the operation stop state. Specifically, the drive control unit 85 executes the simultaneous drive mode in a case where the state of the up-and-down airflow direction adjusting blade 30 is the first open state. More specifically, the drive control unit 85 switches the state of the up-and-down airflow direction adjusting blade 30 from the first open state to the closed state by simultaneously driving the push-out mechanism drive motors 54 and 64 and the angle adjusting mechanism drive motor 73. Further, the drive control unit 85 executes the push-out mechanism drive mode and thereafter executes the simultaneous drive mode in a case where the state of the up-and-down airflow direction adjusting blade 30 is the second open state. More specifically, the drive control unit 85 switches the state of the up-and-down airflow direction adjusting blade 30 from the second open state to the first open state by driving the push-out mechanism drive motors 54 and 64 and thereafter switches the state of the up-and-down airflow direction adjusting blade 30 from the first open state to the closed state by simultaneously driving the push-out mechanism drive motors 54 and 64 and the angle adjusting mechanism drive motor 73. Moreover, the drive control unit 85 executes the angle adjusting mechanism drive mode, thereafter executes the push-out mechanism drive mode, and furthermore executes the simultaneous drive mode in a case where the state of the up-and-down airflow direction adjusting blade 30 is the third open state. More specifically, the drive control unit 85 first switches the state of the up-and-down airflow direction adjusting blade 30 from the third open state to the second open state by driving the angle adjusting mechanism drive motor 73, thereafter switches the state of the up-and-down airflow direction adjusting blade 30 from the second open state to the first open state by driving the push-out mechanism drive motors 54 and 64, and furthermore switches the state of the up-and-down airflow direction adjusting blade 30 from the first open state to the closed state by simultaneously driving the push-out mechanism drive motors 54 and 64 and the angle adjusting mechanism drive motor 73. In this way, the drive control unit 85 switches the state of the up-and-down airflow direction adjusting blade 30 from the first open state, the second open state, or the third open state to the closed state by driving the push-out mechanism drive motors 54 and 64 and the angle adjusting mechanism drive motor 73.

[0142] Further, in a case where the side shielding members 20 and 90 are in the open state when the operation stop command has been given via the remote controller 86 from the air conditioning subject, the drive control unit 85 controls the second mechanism drive motors 24 and 94 in such a way that the state of the side shielding members 20 and 90 switches from the open state to the closed state. For this reason, a state where the up-and-down airflow direction adjusting blade 30 is placed in the first portion 16 of the blow-out opening 15 and the side shielding members 20 and 90 are placed in the second portion 17a and the third portion 17b of the blow-out opening 15-that is, a state where the blow-out opening 15 is shielded-is reached.

[0143] In this way, in the present embodiment, various blow-out directions can be taken by the up-and-down airflow direction adjusting blade 30 and the side shielding members 20 and 90 that are capable of moving independently of the up-and-down airflow direction adjusting blade 30. In the present embodiment, the airflow direction states that the indoor unit 10 is capable of taking are the operation stop state, the first cooling state, the second cooling state, the first heating state, the second heating state, and the three-way airflow direction state, but the indoor unit 10 is not limited to this and may also take other airflow direction states by combinations of the state of the up-and-down airflow direction adjusting blade 30 and the state of the side shielding members 20 and 90.

<Characteristics>

(1)

[0144] In the above-described embodiment, the angle of inclination of the up-and-down airflow direction adjusting blade 30 with respect to the open surface corresponding to the first portion 16 in the blow-out opening 15 is changed as a result of the distance from the first portion 16 of the blow-out opening 15 to the first coupling portions 32 being changed by the push-out mechanisms 51 and 61 and the distance from the first portion 16 of the blow-out opening 15 to the second coupling portion 33 being changed by the angle adjusting mechanism 71. For this reason, the angle of inclination of the up-and-down airflow direction adjusting blade 30 with respect to the open surface corresponding to the first portion 16 in the blow-out opening 15 can be changed after the up-and-down airflow direction adjusting blade 30 has been moved to a position where it does not interfere with members inside the indoor unit casing 12 by moving the coupling portions 32 and 33.

[0145] Because of this, the concern that the up-and-down airflow direction adjusting blade 30 and members inside the indoor unit casing 12 will interfere with each other can be reduced.

(2)

[0146] In the above-described embodiment, the position of the first coupling portions 32 with respect to the first portion 16 of the blow-out opening 15 is moved by the push-out mechanisms 51 and 61. That is, the push-out mechanisms 51 and 61 can move the first coupling portions 32 from a predetermined position to a predetermined position different from the predetermined position. For this reason, the first coupling portions 32 placed in a predetermined position can be moved to a position differing from the predetermined position.

(3)

[0147] In the above-described embodiment, the push-out mechanisms 51 and 61 slide the first coupling portions 32 in such a way that the up-and-down airflow direction adjusting blade 30 is pushed out from the neighborhood of the blow-out opening 15. For this reason, the up-and-down airflow direction adjusting blade 30 can be moved in such a way that the up-and-down airflow direction adjusting blade 30 is pushed out from the neighborhood of the blow-out opening 15.

(4)

[0148] In the above-described embodiment, the angle adjusting mechanism 71 can move the second coupling portion 33 placed in a predetermined position with respect to the first portion 16 of the blow-out opening 15 to a position different from the predetermined position by moving the second coupling portion 33 about the support shafts 57 and 67 supported in the first coupling portions 32. For this reason, the second coupling portion 33 can be moved from a predetermined position to a position differing from the predetermined position.

(5)

[0149] In the above-described embodiment, the angle adjusting mechanism 71 moves the second coupling portion 33 by pushing and pulling the second coupling portion 33 of the up-and-down airflow direction adjusting blade 30. For this reason, the second coupling portion 33 can be moved.

(6)

[0150] In the above-described embodiment, the support shafts 57, 67, and 78 are supported by the shaft support portions 32a and 33a. For this reason, the support shafts 57 and 67, which function as rotating shafts when the state of the up-and-down airflow direction adjusting blade 30 switches from the second open state to the third open state, can be moved to a position away from the first portion 16 of the blow-out opening 15 together with the up-and-down airflow direction adjusting blade 30.

(7)

[0151] In the above-described embodiment, the push-out mechanism drive motors 54 and 64 and the angle adjusting mechanism drive motor 73 are stored inside the indoor unit casing 12 together with the attachment plate 80. For this reason, even if the blow-out opening 15 is open, the concern that the push-out mechanism drive motors 54 and 64 and the angle adjusting mechanism drive motor 73 will be conspicuous can be reduced.

(8)

[0152] In the above-described embodiment, the first coupling portions 32 are placed in two places away from each other on the up-and-down airflow direction adjusting blade 30. Further, the push-out mechanisms 51 and 61 are coupled to the first coupling portions 32 in the two places on the up-and-down airflow direction adjusting blade 30. For this reason, the up-and-down airflow direction adjusting blade can be stably moved compared to a case where a coupling portion of a push-out mechanism is disposed only in one place on the up-and-down airflow direction adjusting blade.

(9)

[0153] In the above-described embodiment, the first coupling portions 32 are placed in the neighborhoods of both end portions 30g and 30h of the up-and-down airflow direction adjusting blade 30. For this reason, the support shafts 57 and 67, which function as rotating shafts of the up-and-down airflow direction adjusting blade 30, can be supported at both end portions 30g and 30h of the up-and-down airflow direction adjusting blade 30.

(10)

[0154] In the above-described embodiment, the drive control unit 85 drives the push-out mechanisms 51 and 61 and the angle adjusting mechanism 71 at arbitrary timings. Further, the drive control unit 85 is capable of executing the push-out mechanism drive mode in which the drive control unit 85 drives only the push-out mechanisms 51 and 61 and the angle adjusting mechanism drive mode in which the drive control unit 85 drives only the angle adjusting mechanism 71. For this reason, at least either one mechanism of the push-out mechanisms 51 and 61 and the angle adjusting mechanism 71 can be driven.

(11)

[0155] In the above-described embodiment, the first push-out mechanism 51 has the push-out mechanism drive motor 54, and the second push-out mechanism 61

has the push-out mechanism drive motor 64. That is, the push-out mechanisms 51 and 61 have the push-out mechanism drive motors 54 and 64 that are independent of one another. Consequently, it is not necessary to dispose spaces for coupling rods, bearings, and so forth for interconnecting the pinion gears 52 and 62 that the push-out mechanisms 51 and 61 have, and low-torque small-sized stepping motors can be employed.

(12)

[0156] In the above-described embodiment, the up-and-down airflow direction adjusting blade 30 is supported at three points: the two first coupling portions 32 and the second coupling portion 33. Further, the two first coupling portions 32 are placed in the neighborhoods of both end portions 30g and 30h of the up-and-down airflow direction adjusting blade 30, and the second coupling portion 33 is placed in the vicinity of the substantial center of the up-and-down airflow direction adjusting blade 30. For this reason, the surface area of the surface including the three points that support the up-and-down airflow direction adjusting blade 30 can be made larger compared to a case where, for example, the two first coupling portions and the second coupling portion are placed in the vicinity of the substantial center of the up-and-down airflow direction adjusting blade. Consequently, the posture of the up-and-down airflow direction adjusting blade 30 can be stably maintained.

<modifications>

(A)

[0157] In the above-described embodiment, the first push-out mechanism 51 has the push-out mechanism drive motor 54, and the second push-out mechanism 61 has the push-out mechanism drive motor 64. Further, the two push-out mechanisms 51 and 61 move the up-and-down airflow direction adjusting blade 30 as a result of being driven by the push-out mechanism drive motors 54 and 64. In other words, they have configurations where one push-out mechanism is driven by one motor.

[0158] Instead of this, the two push-out mechanisms may also be driven by one motor.

[0159] For example, in a case where only either one of the two push-out mechanisms is equipped with a push-out mechanism drive motor and the pinion gears with which the push-out mechanisms are equipped are coupled together by a coupling rod, the rotation of the push-out mechanism drive motor is transmitted not only to the pinion gear coupled to the drive shaft of the push-out mechanism drive motor but also to the other pinion gear by the coupling rod. Further, the moving members are moved as a result of the pinion gears being rotated, and the position of the up-and-down airflow direction adjusting blade can be moved in accompaniment with the movement of the moving members.

[0160] In this way, by driving the two push-out mechanisms with one push-out mechanism drive motor, the number of motors can be reduced.

[0161] Because of this, the number of parts can be cut, so a low cost can be realized. Further, the pinion gears are coupled together by the coupling rod, so the other pinion gear can be rotated in synch with the rotation of the one pinion gear. Consequently, even in a case where the position of the up-and-down airflow direction adjusting blade has been manually moved, it can be made easier for the moving members to move parallel to each other.

(B)

[0162] In the above-described embodiment, the first mechanism 50 of the present invention is employed in the wall-mounted indoor unit 10 that is attached to a wall surface in a room. Instead of this, the first mechanism may also be employed in a ceiling-embedded indoor unit where the indoor unit is placed in such a way as to be embedded in a ceiling.

(C)

[0163] In the above-described embodiment, the indoor unit 10 is equipped with the one angle adjusting mechanism 71 and the two push-out mechanisms 51 and 61.

[0164] Instead of this, the indoor unit may also be equipped with one angle adjusting mechanism and one push-out mechanism or may also be equipped with one angle adjusting mechanism and three or more push-out mechanisms.

[0165] For example, in the case of an indoor unit equipped with one angle adjusting mechanism and one push-out mechanism, a coupling portion for coupling together the angle adjusting mechanism and the up-and-down airflow direction adjusting blade and a coupling portion for coupling together the push-out mechanism and the up-and-down airflow direction adjusting blade may be disposed in shapes that are long in the lengthwise direction of the up-and-down airflow direction adjusting blade, and the coupling portions may be placed in the neighborhood of the front side end portion and the neighborhood of the rear side end portion of the up-and-down airflow direction adjusting blade. By giving the indoor unit this kind of coupling portion configuration, the angle of inclination of the up-and-down airflow direction adjusting blade with respect to the blow-out opening can be changed even with one angle adjusting mechanism and one push-out mechanism.

[0166] Further, for example, in the case of an indoor unit equipped with one angle adjusting mechanism and three push-out mechanisms, the coupling portions of the push-out mechanisms may be placed in the neighborhoods of both end portions of the up-and-down airflow direction adjusting blade and in the vicinity of the substantial center of the up-and-down airflow direction ad-

justing blade-that is, in the neighborhood of the coupling portion of the angle adjusting mechanism. For this reason, the push-out mechanisms are placed in the neighborhoods of both end portions of the up-and-down airflow direction adjusting blade and in the neighborhood of the angle adjusting mechanism. In this way, in a case where there are plural push-out mechanisms, the up-and-down airflow direction adjusting blade can be stably moved compared to a case where the up-and-down airflow direction adjusting blade is pushed out and moved by two push-out mechanisms.

[0167] Further, in the above-described embodiment, the indoor unit 10 is equipped with the one angle adjusting mechanism 71.

[0168] Instead of this, the indoor unit may also be equipped with plural angle adjusting mechanisms. In a case where the indoor unit is equipped with plural angle adjusting mechanisms, the up-and-down airflow direction adjusting blade can be stably moved compared to a case where the angle of inclination of the up-and-down airflow direction adjusting blade with respect to the blow-out opening is changed by one angle adjusting mechanism.

(D)

[0169] In the above-described embodiment, the blow-out opening 15 is formed in the neighborhood of the lower portion of the indoor unit 10. Instead of this, the blow-out opening may also be disposed in the front portion of the indoor unit. Specifically, the blow-out opening may also be formed continuously from the front surface to both side surfaces of the indoor unit casing.

(E)

[0170] In the above-described embodiment, the blow-out opening 15 is formed continuously from the bottom surface to both side surfaces of the indoor unit casing 12 and is covered by the up-and-down airflow direction adjusting blade 30 and the side shielding members 20 and 90. Instead of this, the indoor unit may also have a configuration where the blow-out opening is formed only in the bottom surface of the indoor unit casing and the blow-out opening is covered by only the up-and-down airflow direction adjusting blade.

(F)

[0171] In the above-described embodiment, the push-out mechanisms 51 and 61 and the angle adjusting mechanism 71 are simultaneously driven while the state of the up-and-down airflow direction adjusting blade 30 moves from the closed state to the first open state and while the state of the up-and-down airflow direction adjusting blade 30 moves from the first open state to the closed state, and the push-out mechanisms 51 and 61 and the angle adjusting mechanism 71 are separately driven while the state of the up-and-down airflow direction adjusting blade 30 moves from the first open state to the second open state or the third open state and while the state of the up-and-down airflow direction adjusting blade 30 moves from the third open state or the second open state to the first open state.

[0172] Instead of this, the push-out mechanisms and the angle adjusting mechanism may also be simultaneously driven while the state of the up-and-down airflow direction adjusting blade moves from the first open state to the second open state or the third open state and while the state of the up-and-down airflow direction adjusting blade moves from the third open state or the second open state to the first open state.

[0173] Further, the push-out mechanisms and the angle adjusting mechanism 71 may also be separately driven while the state of the up-and-down airflow direction adjusting blade moves from the closed state to the first open state and while the state of the up-and-down airflow direction adjusting blade moves from the first open state to the closed state.

(G)

[0174] In the above-described embodiment, the angle of inclination of the up-and-down airflow direction adjusting blade 30 with respect to the first portion 16 of the blow-out opening 15 is changed by the push-out mechanisms 51 and 51 and the angle adjusting mechanism 71.

[0175] Instead of this, a mechanism that is the same as the push-out mechanisms 51 and 61 in the above-described embodiment may also be used instead of the angle adjusting mechanism. In other words, the angle of inclination of the up-and-down airflow direction adjusting blade with respect to the open surface corresponding to the first portion in the blow-out opening may also be changed by three push-out mechanisms.

INDUSTRIAL APPLICABILITY

[0176] The present invention can reduce the concern that the up-and-down airflow direction adjusting blade and members inside the indoor unit casing will interfere with each other in a case where the angle of inclination of the up-and-down airflow direction adjusting blade with respect to the blow-out opening is changed, so application of the present invention to an indoor unit of an air conditioner equipped with an up-and-down airflow direction adjusting blade is effective.

REFERENCE SIGNS LIST

[0177]

10	Indoor Unit
12	Indoor Unit Casing (Casing)
15	Blow-out Opening
30	Up-and-down Airflow Direction Adjusting

	Blade (Up-and-down Airflow Direction Adjusting Plate)
32	First Coupling Portions (First Portion)
32a	Shaft Support Portion
33	Second Coupling Portion (Second Portion)
51	First Push-out Mechanism / Push-out Mechanism (First Moving Mechanism)
61	Second Push-out Mechanism / Push-out Mechanism (First Moving Mechanism)
71	Angle Adjusting Mechanism (Second Moving Mechanism)
73	Angle Adjusting Mechanism Drive Motor (Drive Source)
85	Drive Control Unit (Control Unit)
54, 64	Push-out Mechanism Drive Motors (Drive Source)
57, 67	Support Shafts (Rotating Shaft)

CITATION LIST

<Patent Literature>

[0178]

Patent Citation 1: JP-A No. 5-256506

Claims

1. An indoor unit (10) of an air conditioner comprising:

a casing (12) in which an air blow-out opening (15) is formed;
an up-and-down airflow direction adjusting plate (30) that is placed in the neighborhood of the blow-out opening;
a first moving mechanism (51,61) that is coupled to a first portion (32) of the up-and-down airflow direction adjusting plate and is capable of moving the first portion in a direction away from the blow-out opening; and
a second moving mechanism (71) that is coupled to a second portion (33) different from the first portion on the up-and-down airflow direction adjusting plate and is capable of moving the second portion in a direction away from the blow-out opening,
wherein the angle of inclination of the up-and-down airflow direction adjusting plate with respect to the blow-out opening is changed as a result of the distance from the blow-out opening to the first portion being adjusted by the first moving mechanism and the distance from the blow-out opening to the second portion being adjusted by the second moving mechanism.

2. The indoor unit of an air conditioner according to claim 1, wherein the first moving mechanism moves the first portion placed in a first predetermined position with respect to the blow-out opening to a second predetermined position different from the first predetermined position with respect to the blow-out opening.

3. The indoor unit of an air conditioner according to claim 1 or 2, wherein the first moving mechanism slides the first portion in such a way that the up-and-down airflow direction adjusting plate is pushed out from the neighborhood of the blow-out opening.

4. The indoor unit of an air conditioner according to any of claims 1 to 3, wherein the second moving mechanism moves the second portion placed in a third predetermined position with respect to the blow-out opening to a fourth predetermined position different from the third predetermined position with respect to the blow-out opening by moving the second portion about the first portion.

5. The indoor unit of an air conditioner according to any of claims 1 to 4, wherein the second moving mechanism moves the second portion by pushing and pulling the second portion of the up-and-down airflow direction adjusting plate.

6. The indoor unit of an air conditioner according to any of claims 1 to 5, wherein the first portion includes a shaft support portion (32a) for supporting a rotating shaft (57,67) of the up-and-down airflow direction adjusting plate.

7. The indoor unit of an air conditioner according to any of claims 1 to 6, wherein a drive source (54, 64, 73) for driving the first moving mechanism and the second moving mechanism is stored inside the casing.

8. The indoor unit of an air conditioner according to any of claims 1 to 5, wherein
the first portion is placed in two places away from each other on the up-and-down airflow direction adjusting plate, and
the first moving mechanism is coupled to the first portions in the two places on the up-and-dawn airflow direction adjusting plate.

9. The indoor unit of an air conditioner according to claim 8, wherein the first portions in the two places are placed in the neighborhoods of both end portions of the up-and-down airflow direction adjusting plate and include shaft support portions (32a) for supporting rotating shafts (57, 67) of the up-and-down airflow direction adjusting plate.

10. The indoor unit of an air conditioner according to any of claims 1 to 9, further comprising a control unit (85) that controls the driving of the first moving mecha-

nism and the second moving mechanism, wherein the control unit drives the first moving mechanism and the second moving mechanism at arbitrary timings.

11. The indoor unit of an air conditioner according to claim 10, wherein the control unit is capable of executing a first drive mode in which the control unit drives only the first moving mechanism.

12. The indoor unit of an air conditioner according to claim 10 or 11, wherein the control unit is capable of executing a second drive mode in which the control unit drives only the second moving mechanism.

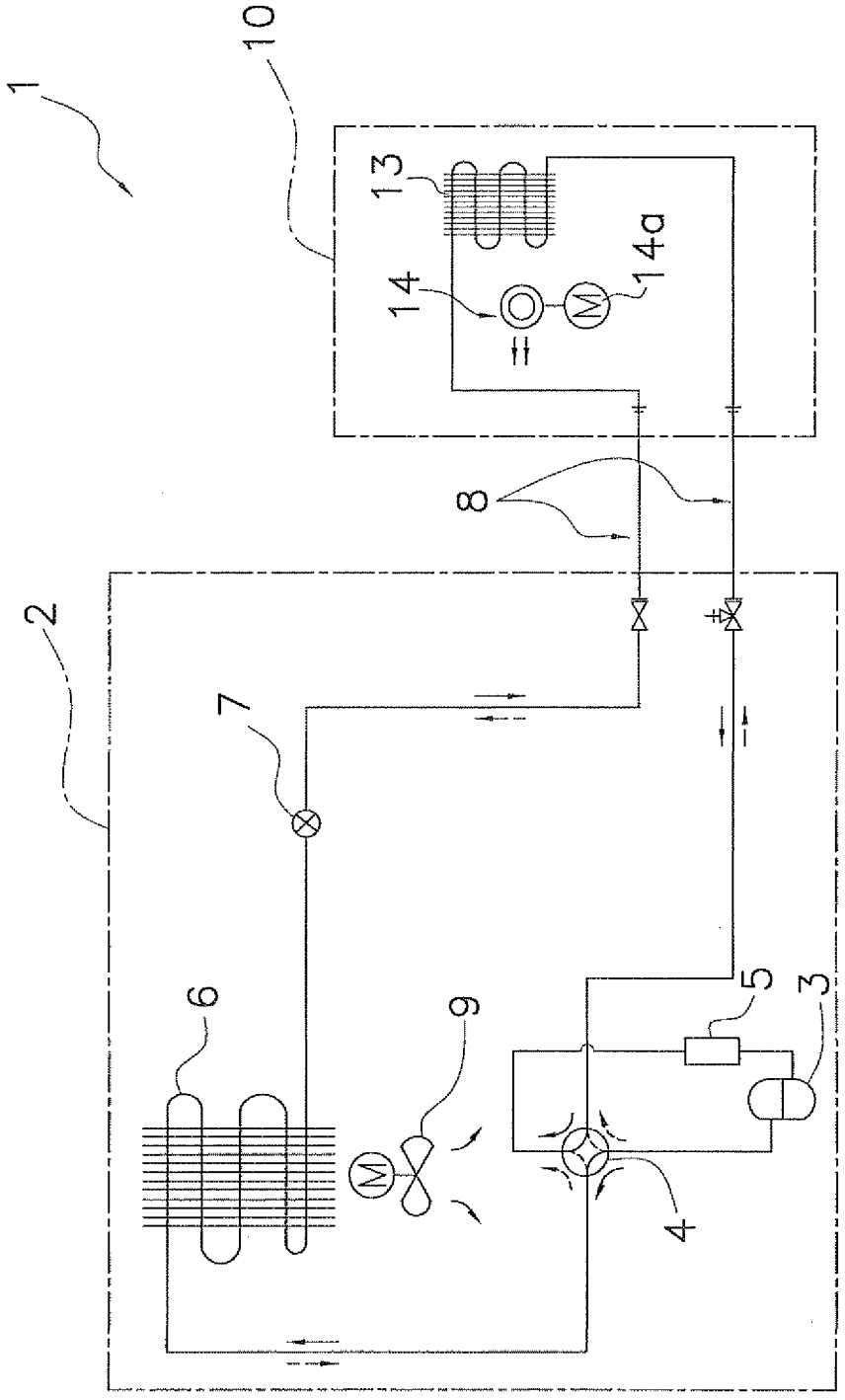

FIG. 1

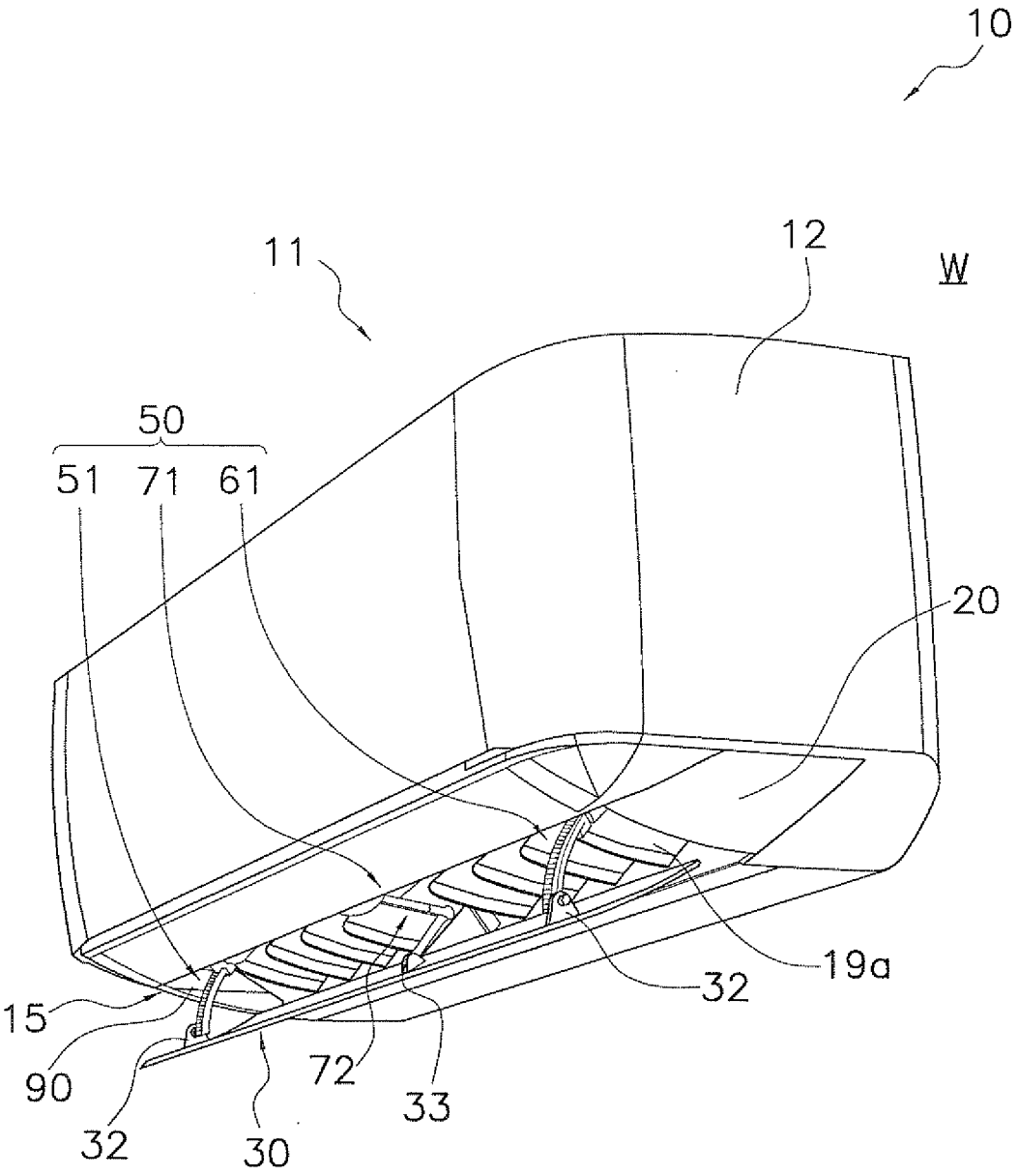

FIG. 2

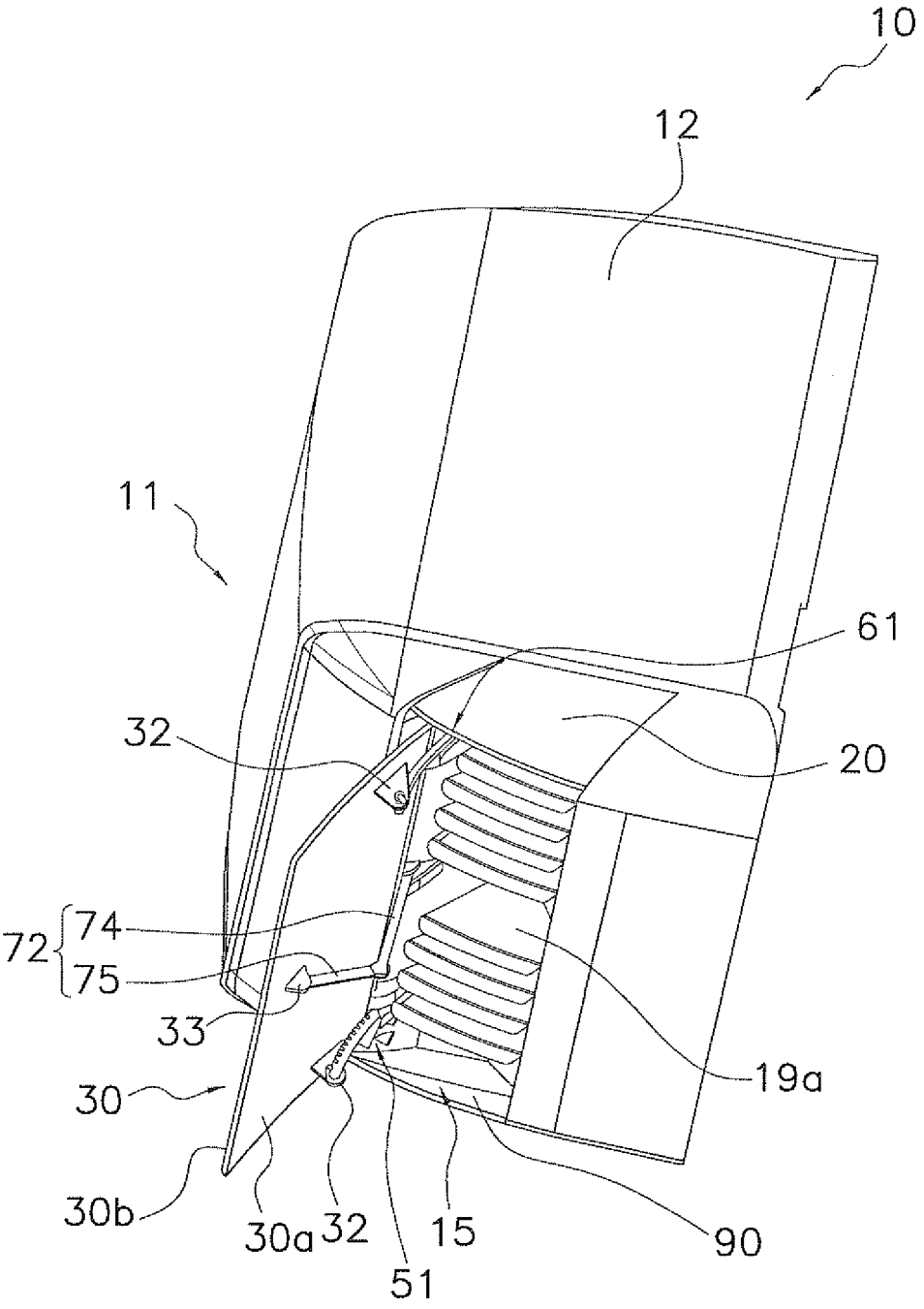

FIG. 3

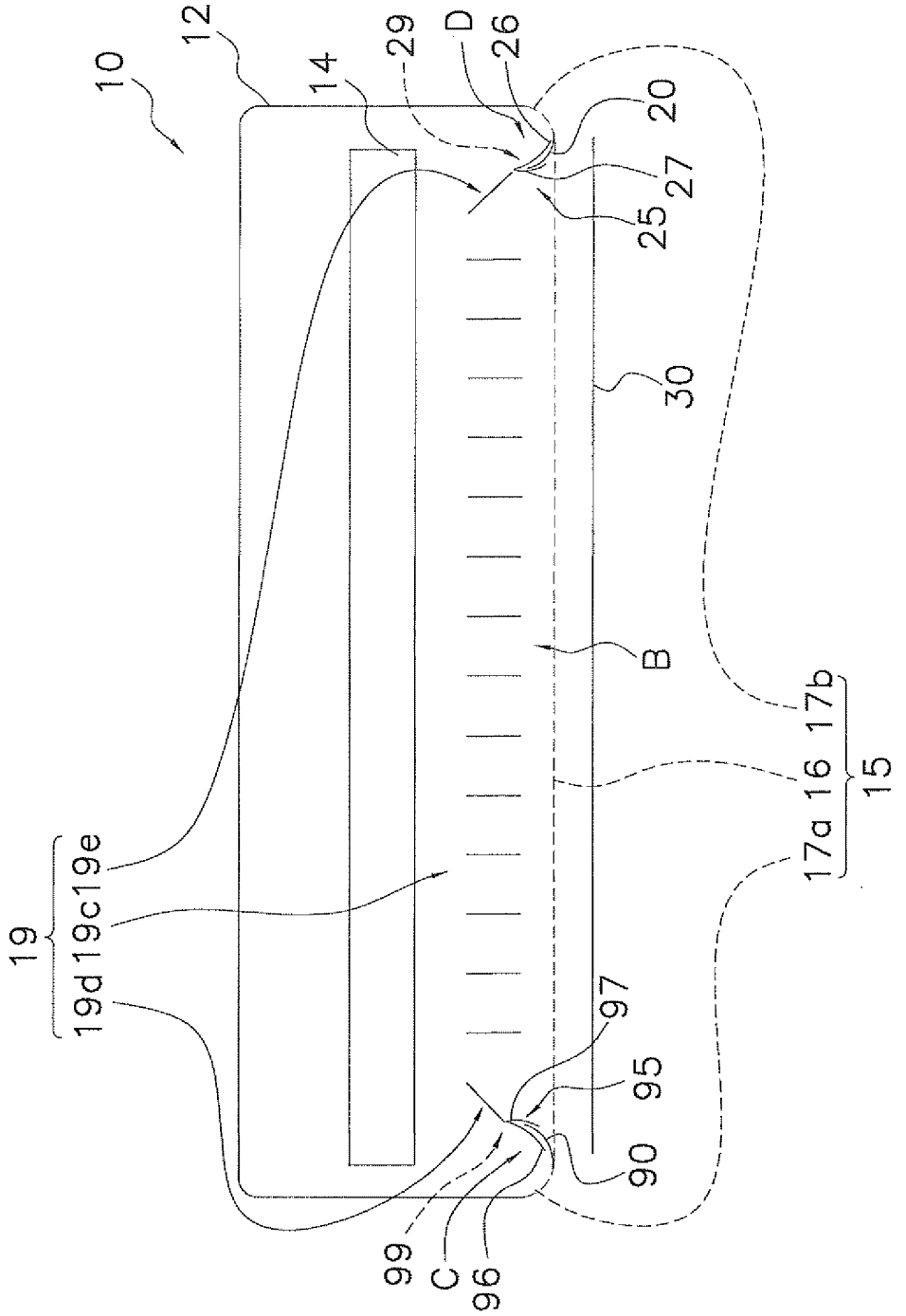
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FIG. 4

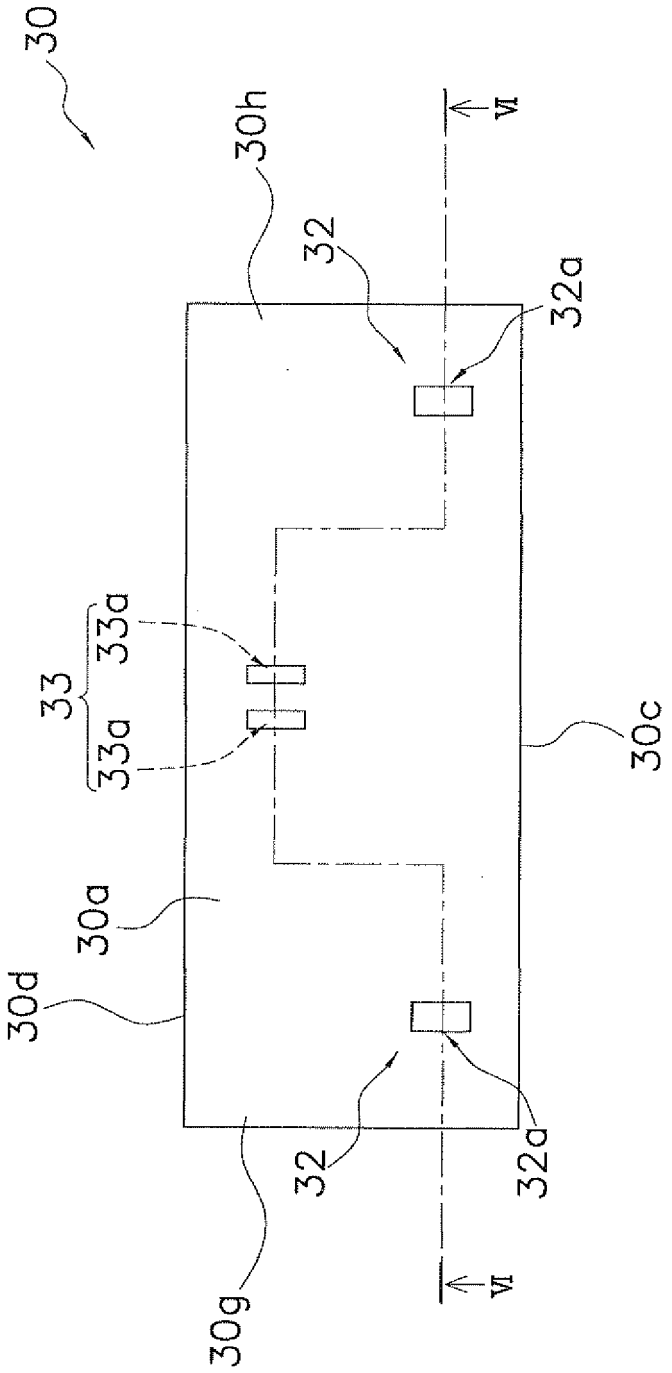


FIG. 5

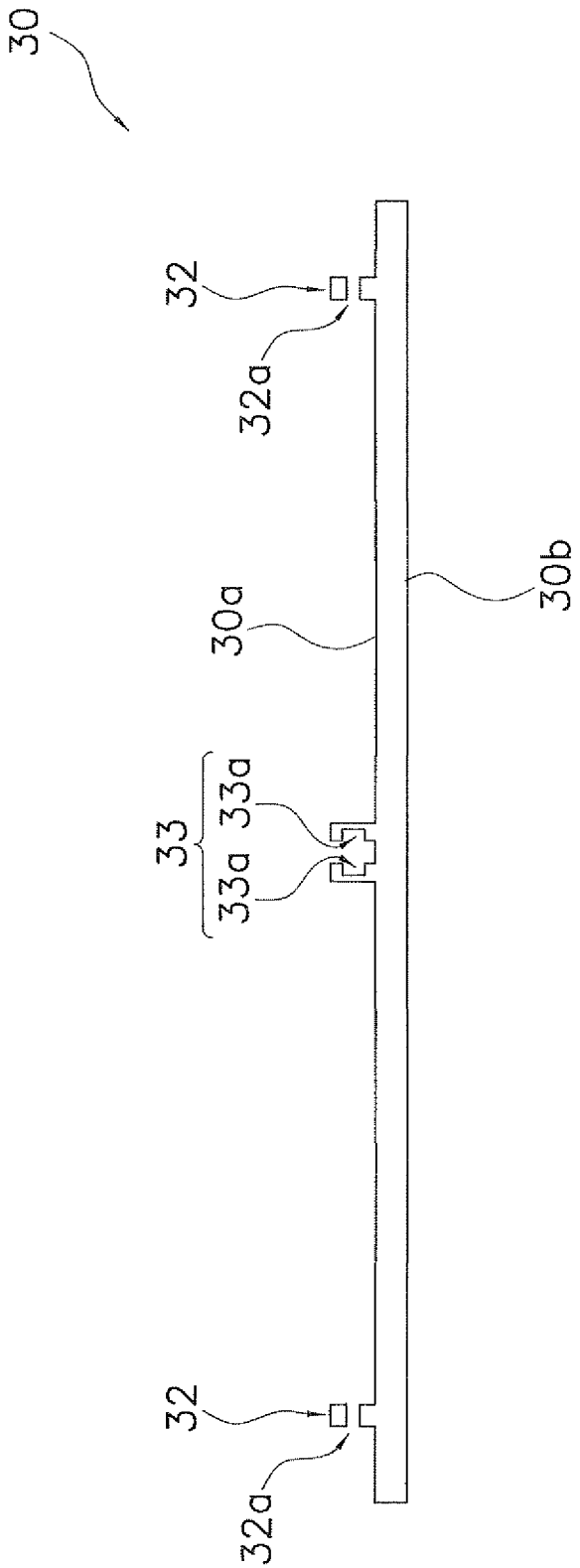
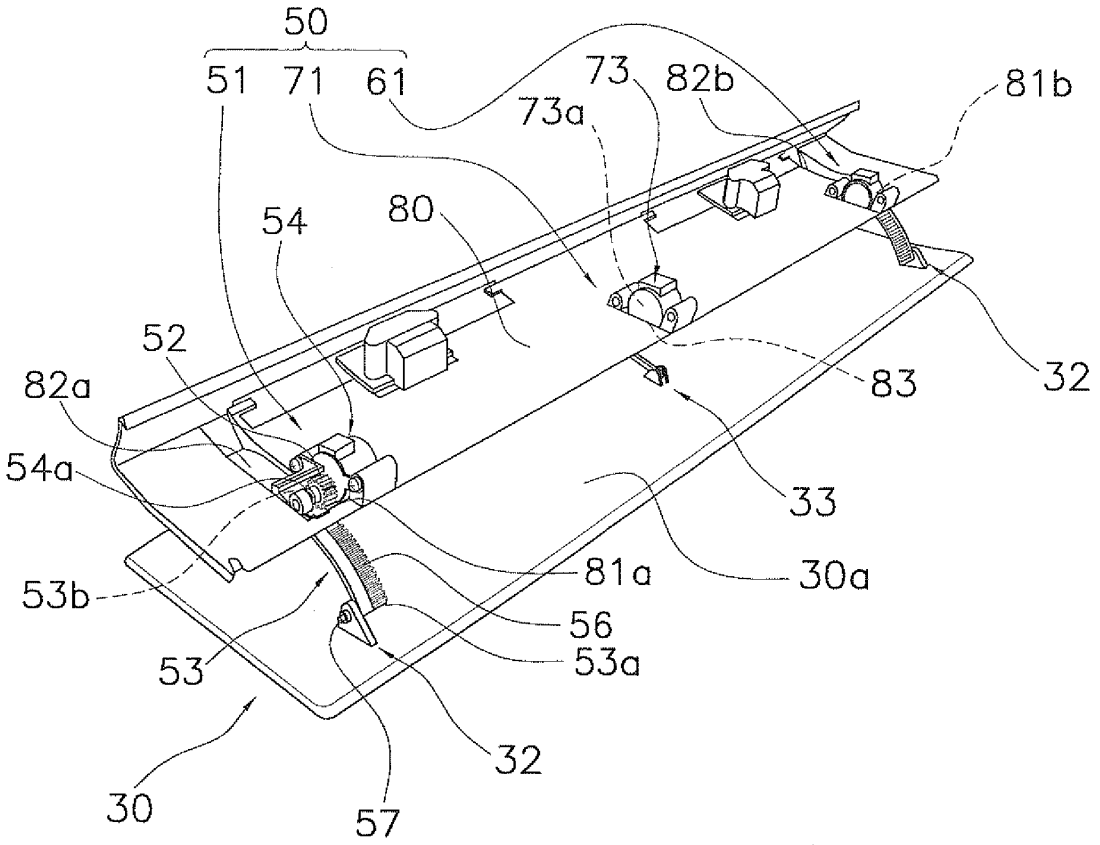


FIG. 6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57

FIG. 7

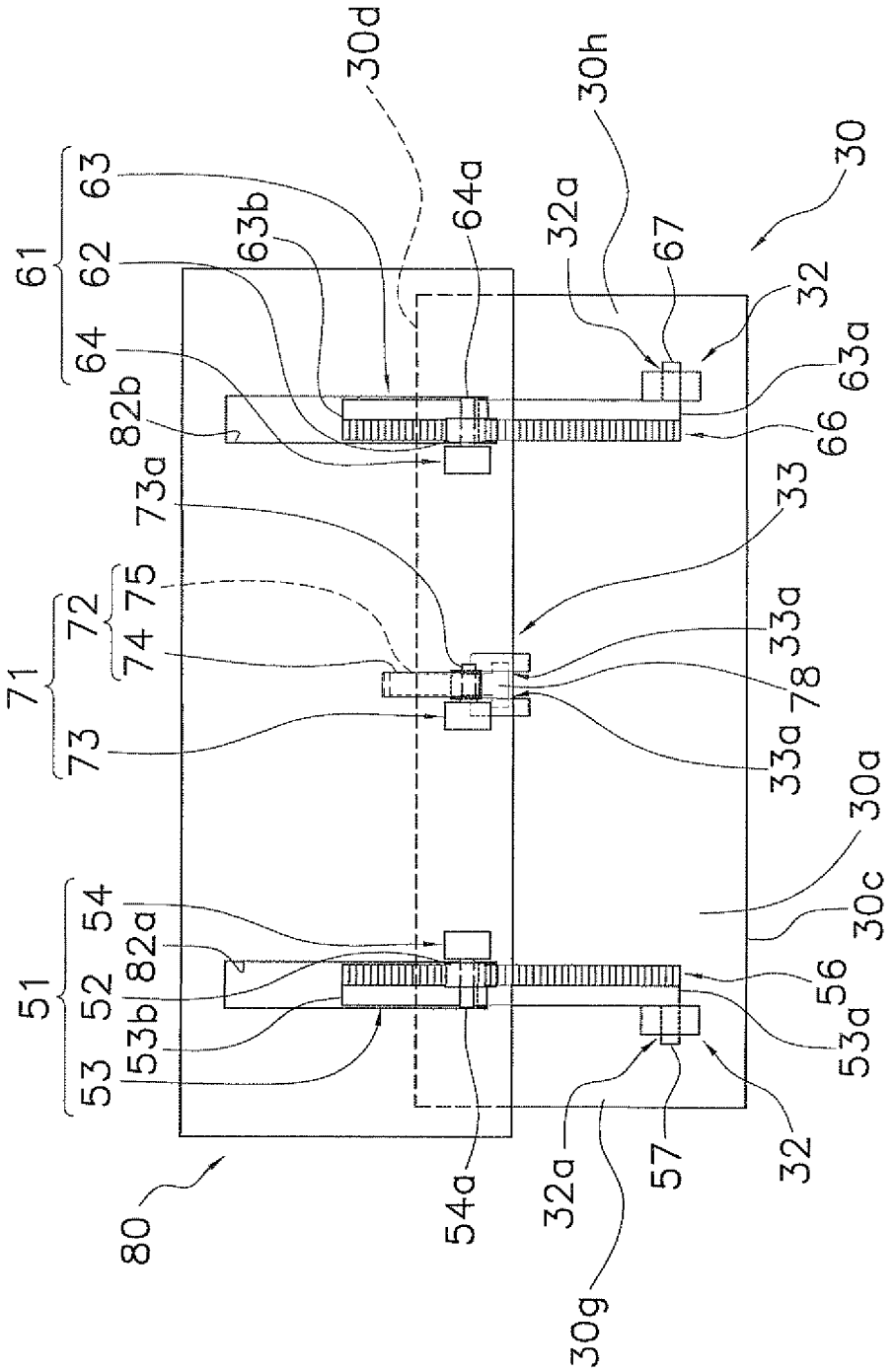
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FIG. 8

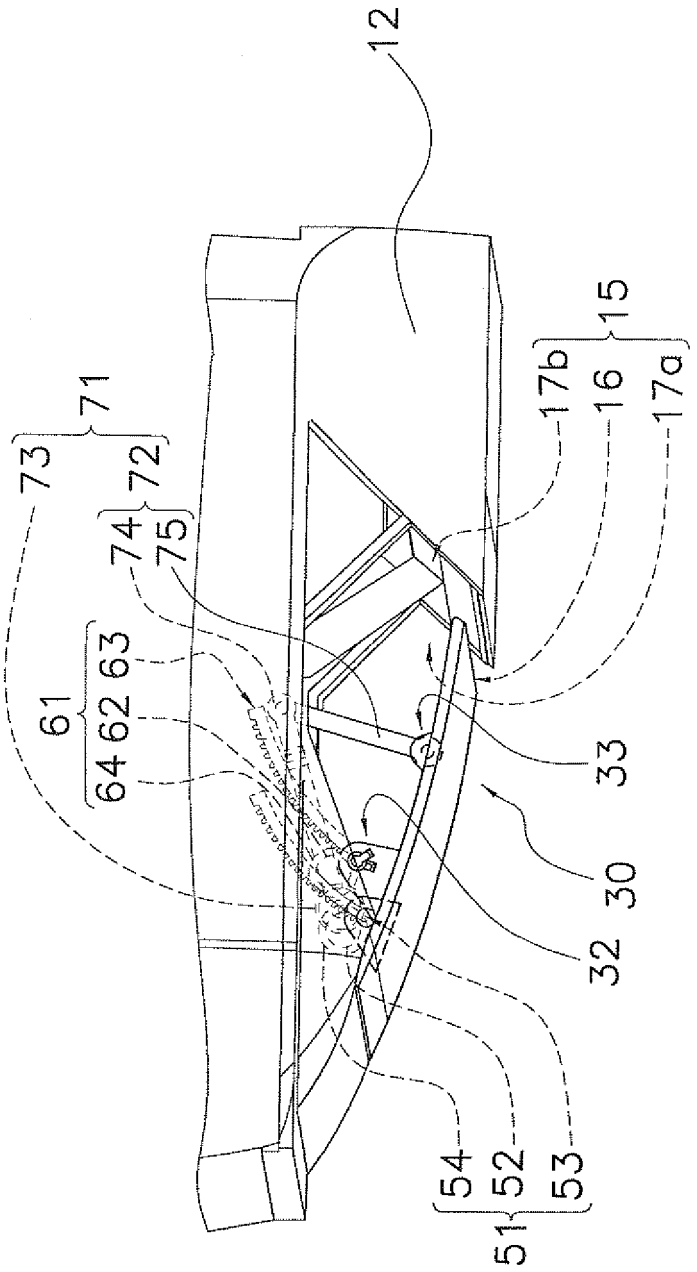

FIG. 9

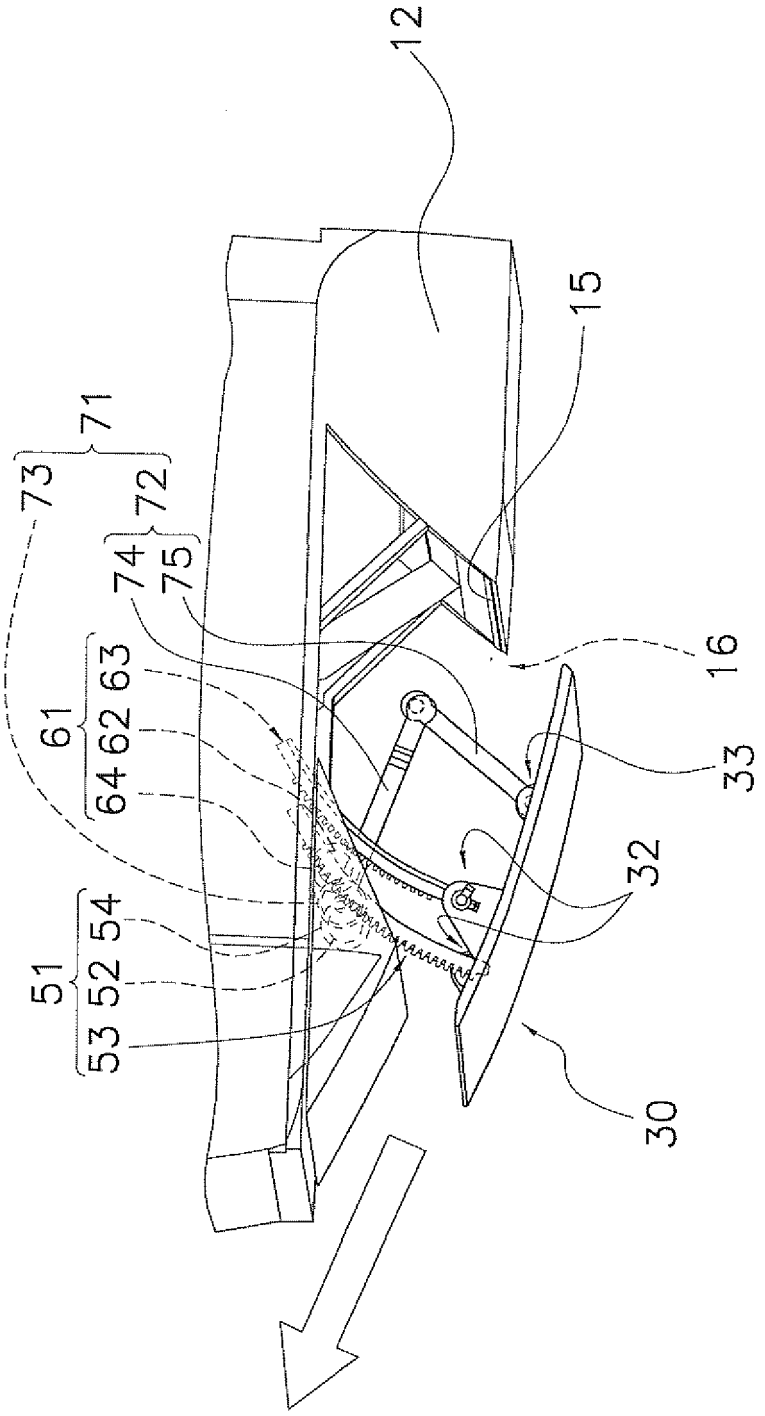

FIG. 10

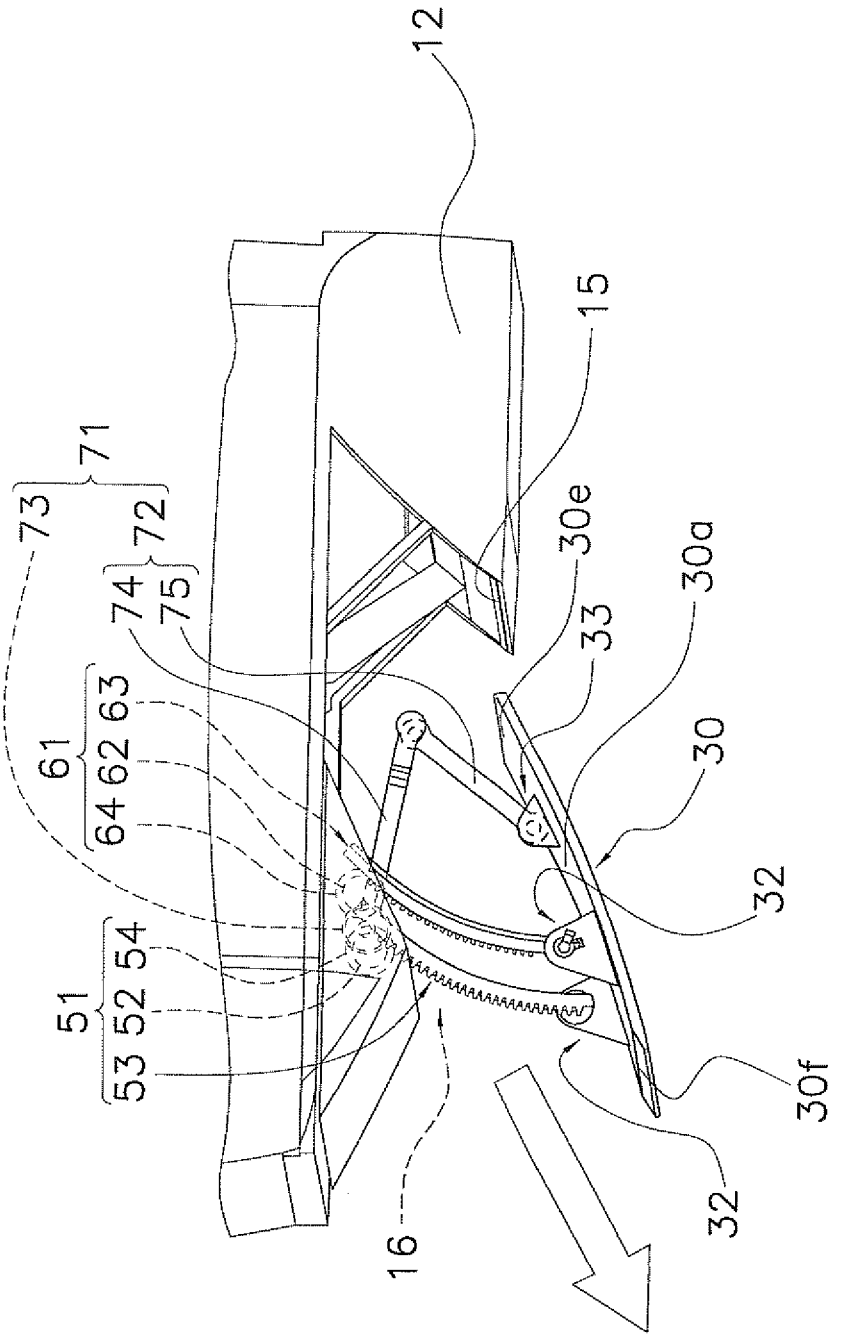

FIG. 11

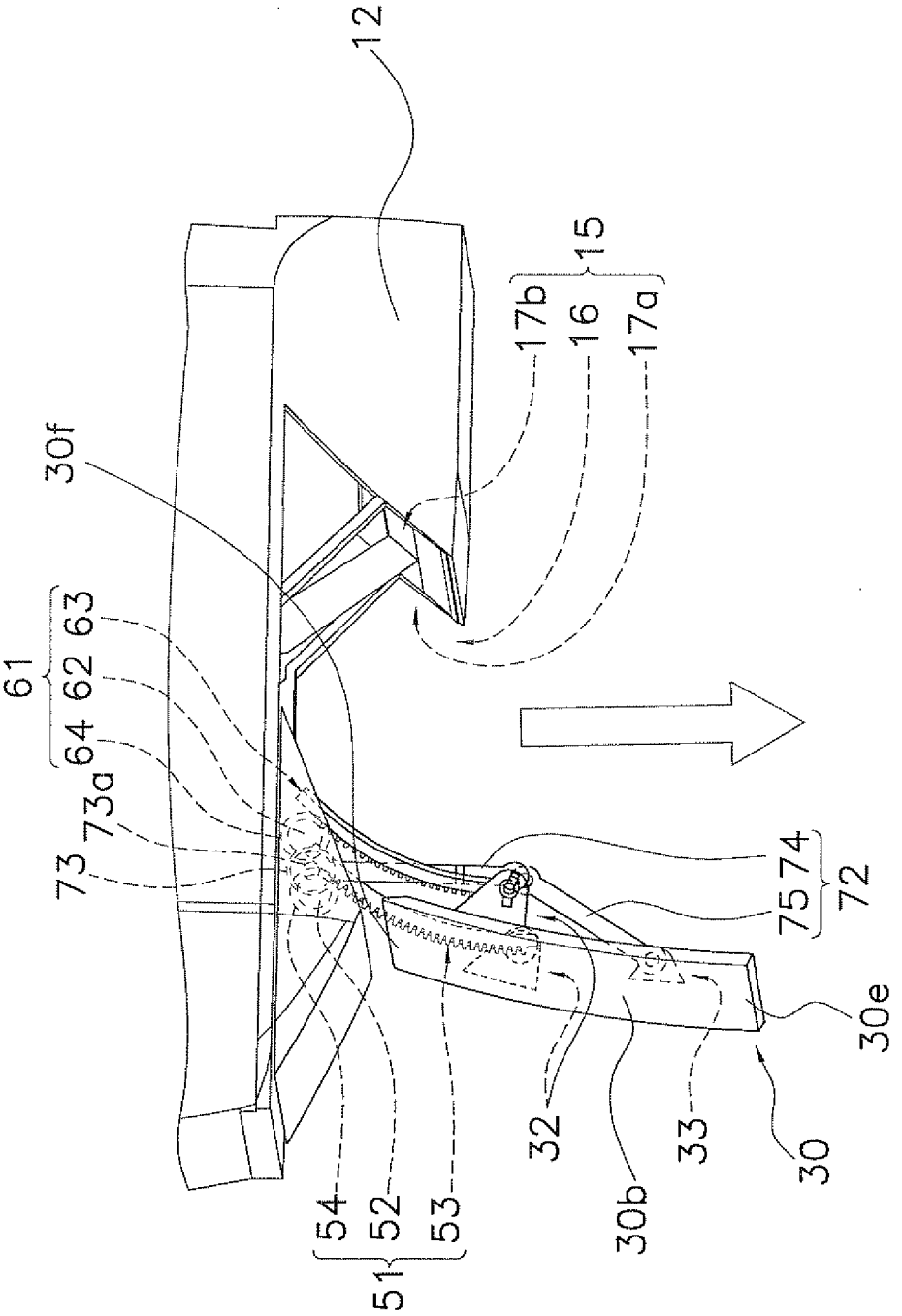
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FIG. 12

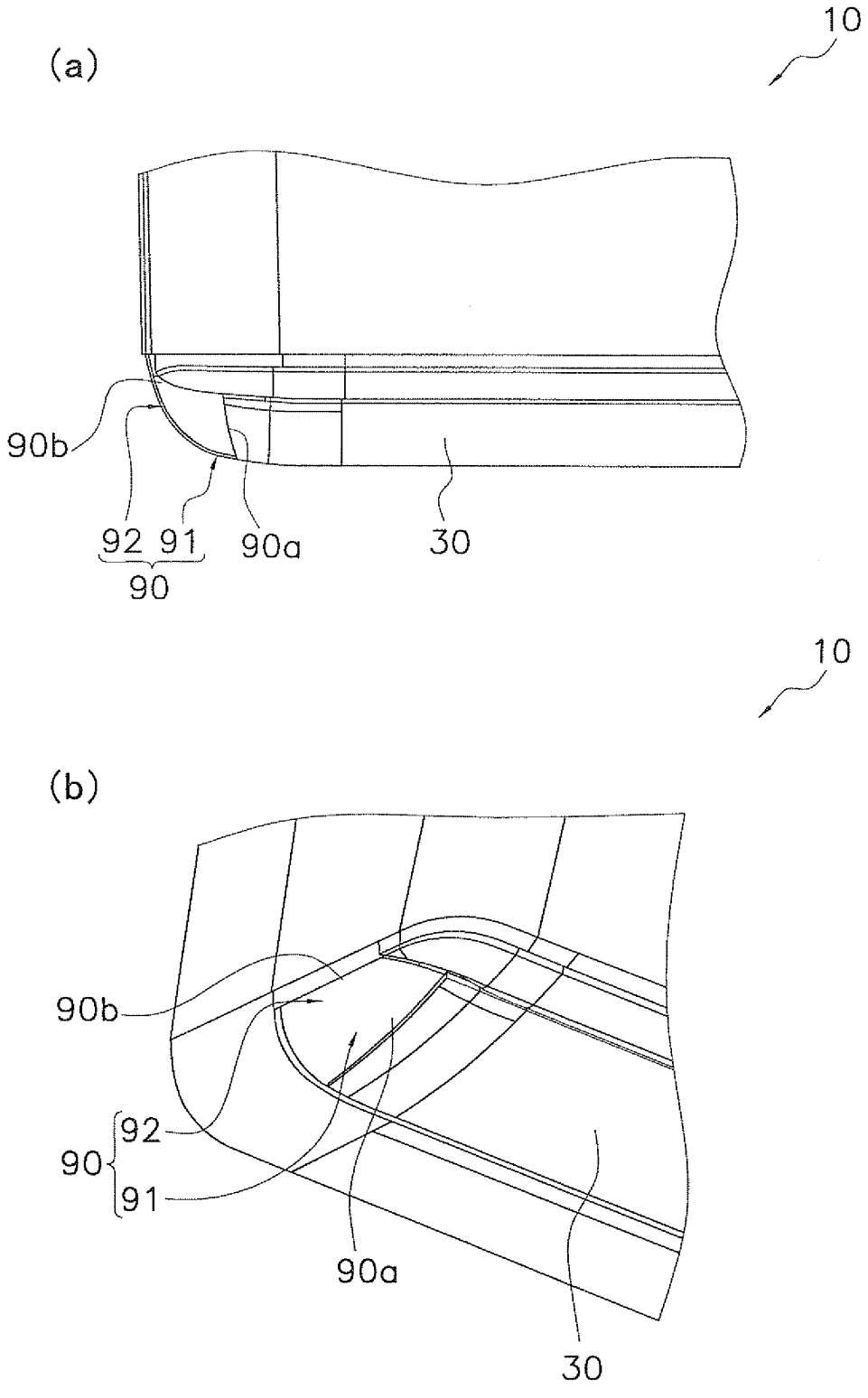


FIG. 13

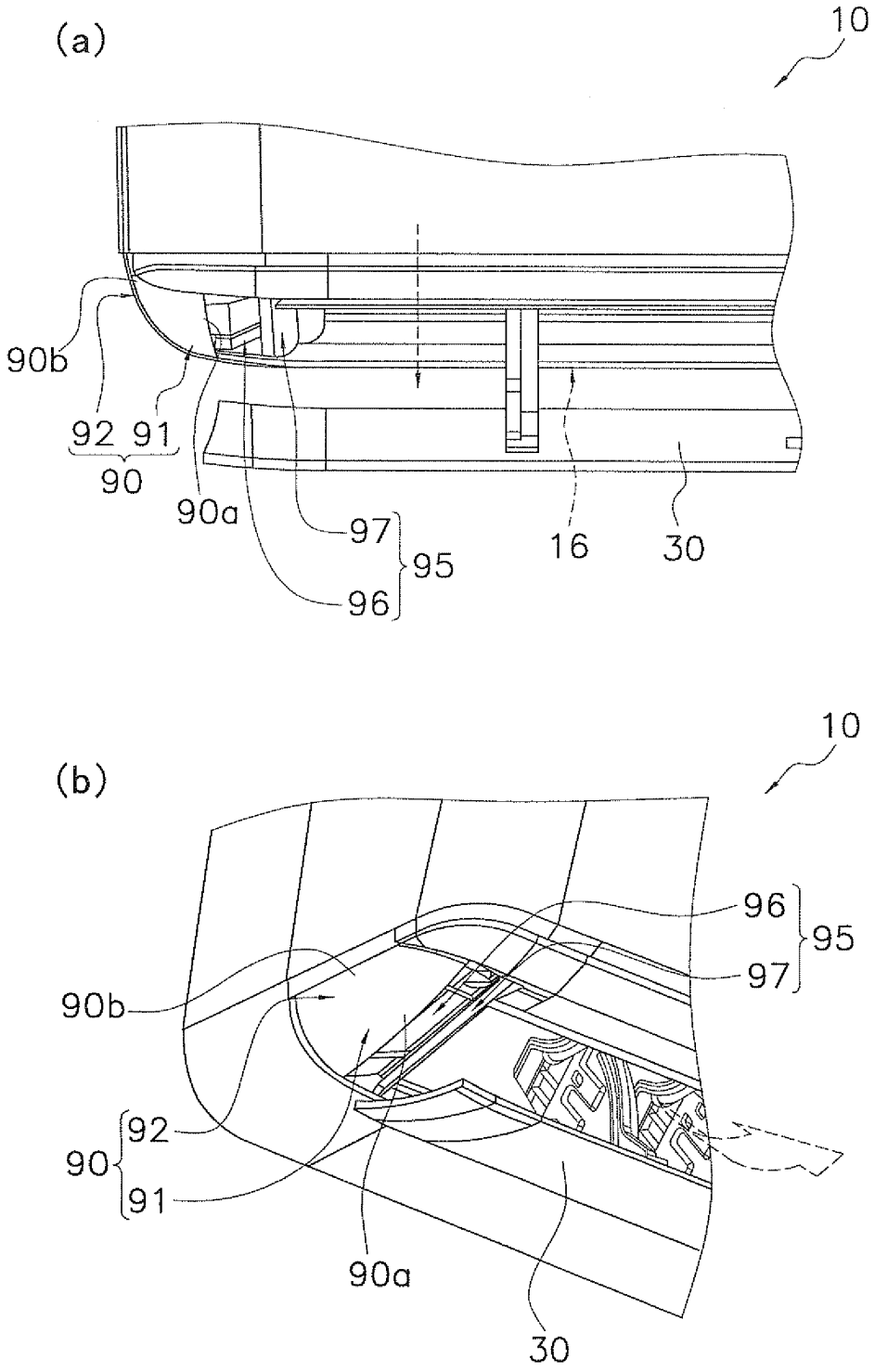


FIG. 14

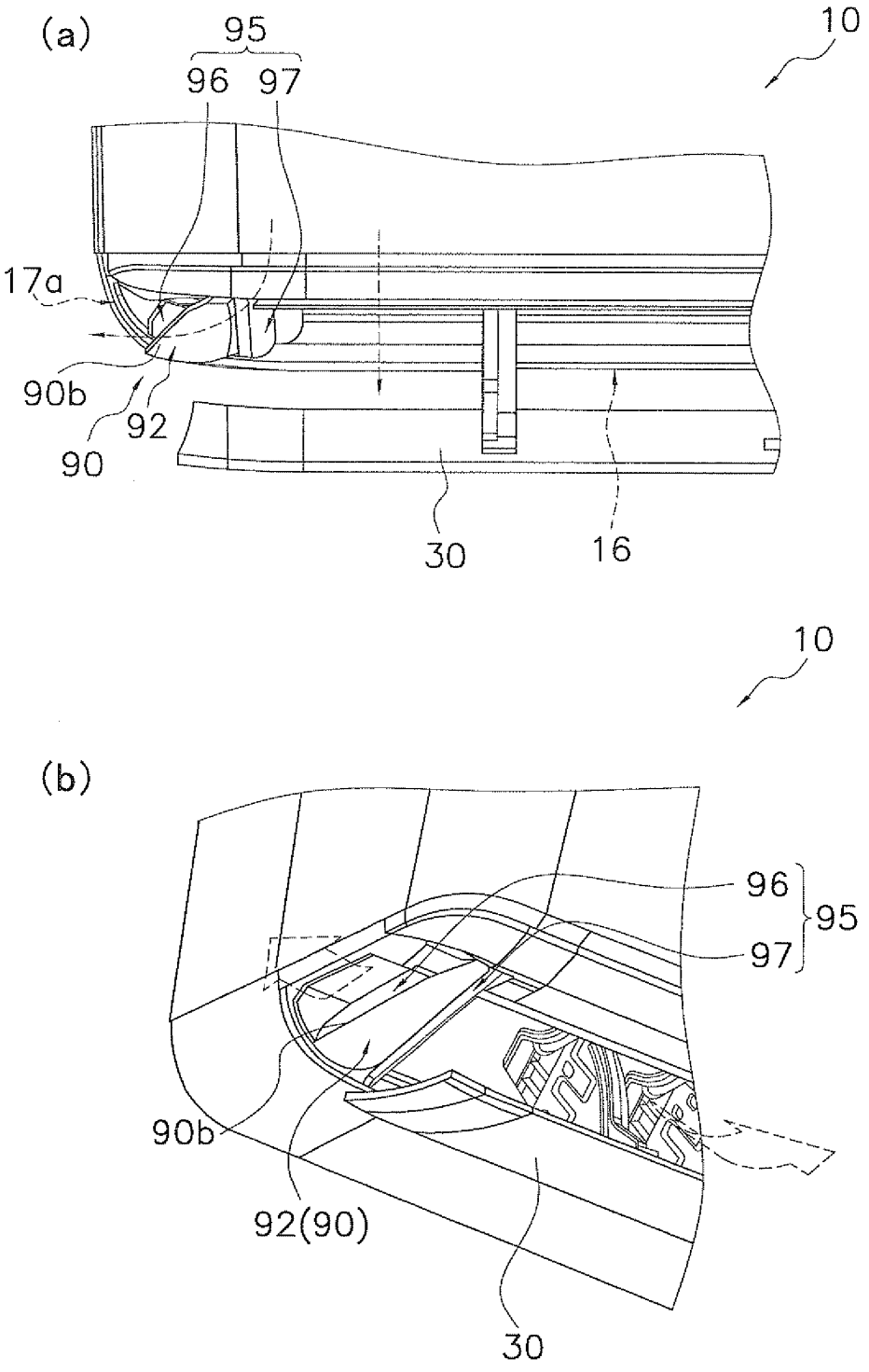
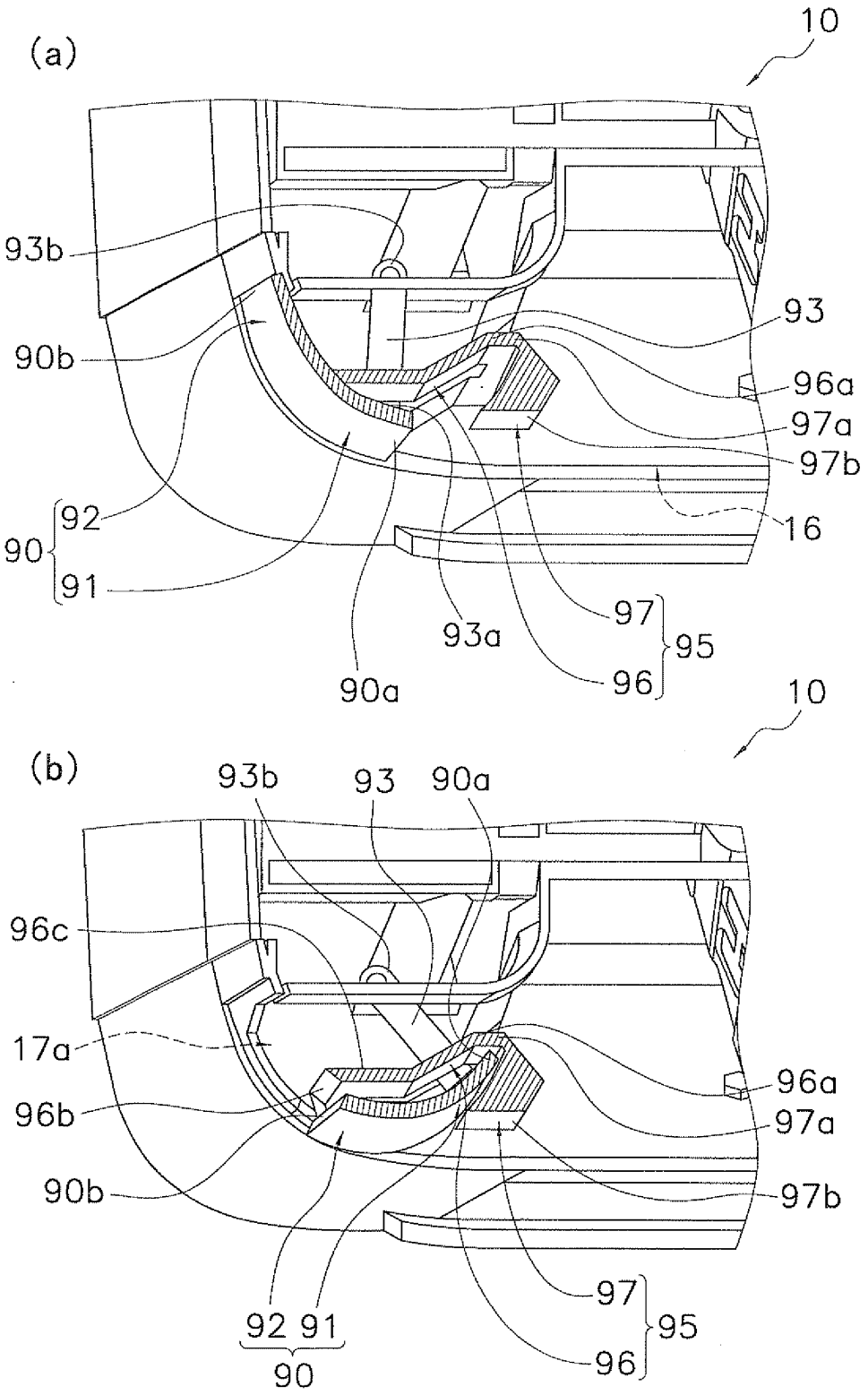


FIG. 15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(b)
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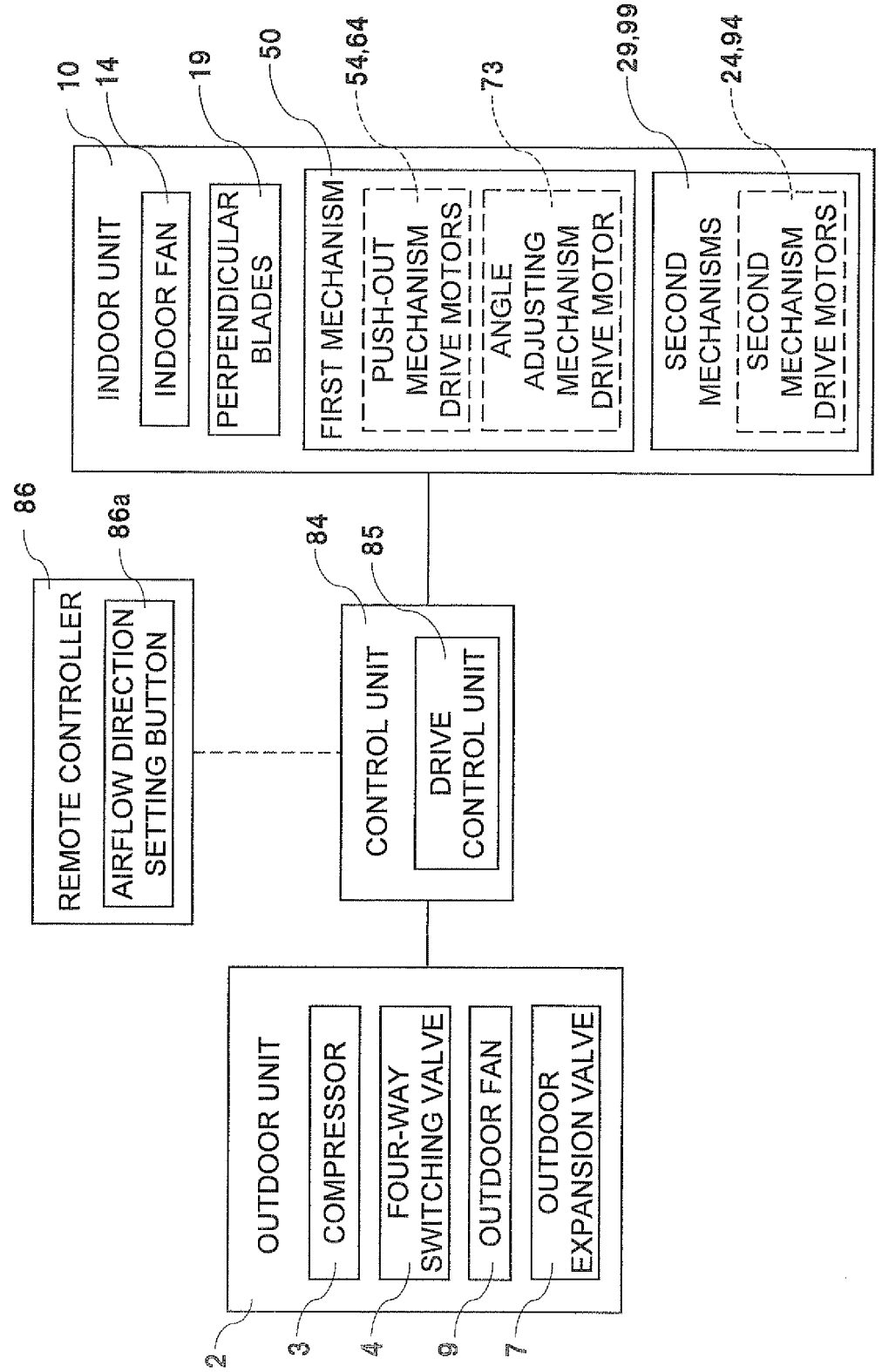
FIG. 16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INDOOR UNIT
INDOOR FAN
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PUSH-OUT MECHANISM DRIVE MOTORS
ANGLE ADJUSTING MECHANISM DRIVE MOTOR
SECOND MECHANISMS
SECOND MECHANISM DRIVE MOTORS
86
86a
84
85
REMOTE CONTROLLER
AIRFLOW DIRECTION SETTING BUTTON
CONTROL UNIT
DRIVE CONTROL UNIT
OUTDOOR UNIT
COMPRESSOR
FOUR-WAY SWITCHING VALVE
OUTDOOR FAN
OUTDOOR EXPANSION VALVE
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3
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9
7

FIG. 17

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2010/004409

A. CLASSIFICATION OF SUBJECT MATTER
F24F13/20(2006.01)i, *F24F13/14*(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
F24F13/20, F24F13/14

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

Jitsuyo Shinan Koho	1922-1996	Jitsuyo Shinan Toroku Koho	1996-2010
Kokai Jitsuyo Shinan Koho	1971-2010	Toroku Jitsuyo Shinan Koho	1994-2010

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	JP 8-247491 A (Fujitsu General Ltd.), 27 September 1996 (27.09.1996), entire text; fig. 1 to 6 (Family: none)	1-5,7,10-12 6,8,9
Y	JP 8-240337 A (Zexel Corp.), 17 September 1996 (17.09.1996), paragraphs [0018] to [0022]; fig. 2 (Family: none)	6,8,9

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
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"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search 26 July, 2010 (26.07.10)	Date of mailing of the international search report 03 August, 2010 (03.08.10)
Name and mailing address of the ISA/ Japanese Patent Office Facsimile No.	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2010/004409

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

The inventions in claims 1 - 12 are not so linked as to form a single general inventive concept on account of the following reason.

Namely, the matter common to the inventions in claims 1 - 12 is relevant to the matter (hereinafter referred to as "common matter") described in claim 1.

(continued to extra sheet)

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

Form PCT/ISA/210 (continuation of first sheet (2)) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2010/004409

Continuation of Box No.III of continuation of first sheet(2)

However, the search revealed that the above-said common matter is not novel, since the common matter is disclosed in JP 8-247491 A (Fujitsu General Ltd.), 27 September 1996 (27.09.1996), entire text, fig. 1 - 6.

As a result, the above-said common matter does not make contribution over the prior art, and therefore is not a special technical feature in the meaning of the second sentence of PCT Rule 13.2.

Form PCT/ISA/210 (extra sheet) (July 2009)

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 5256506 A **[0003] [0178]**