

Description

[0001] The present invention relates to an air conditioner, and more particularly to an apparatus for redirecting wind in an air conditioner for selectively converting and guiding the discharge direction of the conditioned air by a variable air duct.

[0002] Recently, as desires for pursuing a comfortable environment for an office space as well as a living space have increased, air conditioners such as cooling and heat units have been widely used.

[0003] The air conditioner mainly performs cooling and heating functions for maintaining the optimum temperature and humidity according to the seasonal climatic condition and interior environment. Especially, many researches and developments have been attempted for improving the energy consumption efficiency as well as for enlarging, high-grading, and systemizing cooling air conditioners.

[0004] The air conditioner, as well known, includes various types of product groups which are classified into a separation type air conditioner such as a stand type, a hanger type, a frame type, and a ceiling cassette type, in which an indoor unit and an outdoor unit are separated from each other, and an integration type such as a window type, in which an indoor unit and an outdoor unit are integrated.

[0005] Generally, as shown in FIG. 1, an indoor unit of an air conditioner which forms a refrigerant circulation cycle with an outdoor unit performs the cooling function by sucking the interior air through an air suction opening 11a of a front cover 11 by rotation of a fan motor 18 and a centrifugal fan 14 embedded in a rectangular box type (or frame type) cabinet 10 and discharging the cool air generated by cooling the sucked air when the sucked air passes a heat exchanger 13 into an interior space through an air duct 17 forming a passage by an orifice 15 and a scroll guide 16.

[0006] In other words, as shown in the figure, the conventional indoor unit guides the discharge of the cool air through the passage formed by the cooperation of the orifice 15 and the scroll guide 16 constituting the air duct 17. As shown in FIGs. 1 and 2, the wind of the discharged cool air can be restrictively redirected through changes of the right or left wind direction and changes of the upward or downward wind direction by the flow of a louver 11b and a vane 11c which are installed at a corner portion of the front cover 11 in an openable state.

[0007] However, since the orifice 15 and the scroll guide 16 are installed in the interior of the cabinet 10 in the initial designing and manufacturing processes, with these elements being fixed to the cabinet 10, to form the air duct, the cool air discharge passage has a single uniform pattern.

[0008] The air duct structure (the structure having the fixed scroll guide) for forming the cool air discharging passage of the conventional air conditioner can be applied not only to a product model such as the frame type

air conditioner, the hanger type air conditioner, and the window type air conditioner as shown in FIGs. 1 and 2 but also a fixed duct structure which is of the substantially same type can be applied to, for example, an indoor unit of a stand type air conditioner.

[0009] On the other hand, in the conventional air conditioner shown in FIGs. 1 and 2, although the constitution including a pair of centrifugal fans 14 and a pair of air ducts 17 (15 and 16) provided at the circumference of the centrifugal fans 131 is exemplified, even in the constitution in which one or at least three centrifugal fans are installed, the structure of the fixed air duct formed by the fixed scroll guide can be applied to the substantially same type.

[0010] Therefore, in the conventional air conditioner, the cool air discharging direction of the duct passage formed in the interior of the cabinet 10 depends only on the initially designed passage pattern. Thus, since the redirection of the wind by the selection of the operation of a user is impossible and various patterns of wind redirecting functions cannot be realized, there is a limit in optimizing the cooling function and efficiency.

[0011] On the other hand, in the case in which the cool air discharged from the interior air duct of the cabinet 10 to the outside by selectively controlling the opening/closing state of the louver 11ba and the vane 11c is redirected, noise is generated due to the interruption and leakage of the cool air discharged through the cool air discharge opening of the air duct at the circumference of the louver 11b and the vane 11c controlled so as to be controlled to set the wind direction.

[0012] Further, since the discharged cool air interrupted from being discharged outside of the cabinet 10 by the louver 11b and the vane 11c controlled to be closed for wind redirection interferes the cool air discharged outside the cabinet 10 through a normal open path, the wind state becomes unstable, thereby lowering the wind amount efficiency and the cooling function.

[0013] Furthermore, in the conventional air conditioner, the practical restriction in which the louver 11b and the vane 11c are designed so as to have an open angle of about 120 degrees due to the designing and manufacturing technologies limits the opening degree.

[0014] Therefore, since the degree of freedom to the control of the wind direction angle of the discharged cool air is restricted, the product efficiency and the reliability lower due to the increase of noise and the reduction of wind amount.

[0015] An object of the present invention is to provide an apparatus for redirecting wind in an air conditioner having an improved degree of freedom to the redirection of wind of the discharged air by using a variable air duct.

[0016] It is another object of the present invention to provide an air conditioner including the apparatus for redirecting wind for achieving the above-mentioned object.

[0017] In order to achieve the above-mentioned objects, there is provided an apparatus for redirecting wind in an air conditioner, the apparatus comprising: a fan mo-

tor unit for sucking and discharging exterior air so that the exterior air can be heat-exchanged by a heat exchanger embedded in a cabinet; an air duct embedded in the cabinet so as to form an air passage at the circumference of the fan motor unit, for guiding the air discharge direction; and a drive unit for varying the position of a discharge opening of the air duct.

[0018] In order to achieve the above-mentioned objects, there is provided an air conditioner comprising: a cabinet having an air suction opening and a discharge opening; a heat exchanger embedded in the cabinet; a fan motor unit installed so as to face the heat exchanger, for sucking and discharging exterior air; an air duct embedded in the cabinet so as to form an air passage at the circumference of the fan motor unit, for guiding the air discharge direction; and a drive unit for varying the position of a discharge opening of the air duct.

[0019] According to the air conditioner and the apparatus for redirecting wind in the air conditioner according to the present invention, it is preferable that the fan motor unit comprise: a centrifugal fan installed so as to face the heat exchanger; and a drive motor for driving and rotating the centrifugal fan.

[0020] According to another aspect of the present invention, a plurality of fan motor units can be installed so as to face the heat exchanger and to be parallel to each other.

[0021] It is preferable that air duct comprise: a plurality of passage guides disposed on the inner side of the cabinet so as to form a plurality of discharge openings; and a scroll guide installed around the fan motor unit so as to form an air discharge passage by cooperating with the plurality of passage guides. At least one air discharge opening is formed in the scroll guide.

[0022] It is preferable that the drive unit comprise: a drive motor installed so as to be supported by the cabinet; a drive gear installed at an output shaft of the drive motor; a driven gear installed at the outer periphery of the air duct so as to be engaged with the drive gear; and a guide section installed in the cabinet so as to support the air duct in a movable state. It is preferable that an annular rack gear be disposed along the outer peripheral surface of the air duct, i.e. the scroll guide in the driven gear.

[0023] According to another aspect of the present invention, the drive unit comprises: a drive motor installed so as to be supported by the cabinet; a drive gear provided at an output shaft end of the drive motor; a sprocket installed in the air duct; a chain (a belt) installed so as to travel on an endless track and connecting the drive gear and the sprocket; and a guide section installed in the cabinet so as to support the air duct in a movable state.

[0024] According to another aspect of the present invention, a rotational shaft is installed at a central portion of a rear partition panel of the air duct, i.e. the scroll guide, and a direct rotation driving method in which the rotational shaft is connected to the output shaft of the drive motor can be applied to the present invention. In the above-mentioned structure, the drive shaft of the fan motor and

the rotational shaft of the scroll guide can be eccentrically installed. On the other hand, the rotational shaft of the hollow scroll guide has a hollow shape having a predetermined inner diameter and the fan motor and the drive shaft can be coaxially installed so that they are embedded in the hollow portion.

[0025] According to another aspect of the present invention, it is preferable that the guide section comprise: a guide rib protruding from the circumference of the body of the air duct; and a support bar installed so as to protrude from the cabinet and making contact with the inner side of the guide rib to support the air duct.

[0026] According to another aspect of the present invention, it is preferable that the guide section comprise: a support bar installed so as to be supported by the cabinet; a guide rail provided in the body of the air duct; and a roller member provided at the tip end of the support bar so as to be mutually engaged with the guide rail to be moved.

[0027] The above and other objects, features and advantages of the present invention will be more apparent from the following detailed description taken in conjunction with the accompanying drawings, in which:

[0028] Fig. 1 is an exploded perspective view schematically showing a main section of an indoor unit to explain a cool air discharging structure of a conventional air conditioner;

[0029] FIG. 2 is a front view schematically showing a main section of an indoor unit to mimetically explain a cool air discharging state of a conventional air conditioner;

[0030] FIG. 3 is an exploded perspective view schematically showing a main section of an indoor unit to explain an apparatus for redirecting wind in an air conditioner according to a preferred embodiment of the present invention;

[0031] FIG. 4 is a side view schematically showing a state in which the apparatus of the air conditioner shown in FIG. 3 is engaged;

[0032] FIGs. 5A and 5B are schematic perspective views showing a scroll guide and a drive section of FIGs. 3 and 4 from different directions;

[0033] FIG. 6 is a schematic perspective view showing a drive section of a scroll guide according to another preferred embodiment of the present invention;

[0034] FIGs. 7A and 7B are schematic top views the redirecting states according to the operation of an apparatus for redirecting wind in an air conditioner according to the present invention;

[0035] FIG. 8 is a schematic perspective view showing a scroll guide applied to an apparatus for redirecting wind in an air conditioner according to another preferred embodiment of the present invention; and

[0036] FIG. 9 is a schematic top view for explaining the wind redirecting state of an apparatus for redirecting wind in an air conditioner to which the scroll guide of FIG. 8 is applied.

[0037] Hereinafter, an air conditioner and an appara-

tus for redirecting wind according to the preferred embodiments of the present invention will be described in detail.

[0038] Referring to FIGs. 3 and 4, an air conditioner according to the present invention includes a heat exchanger 120 and a fan motor unit (a centrifugal fan 131 and a fan motor 132) embedded in a cabinet 110, air ducts 140, 150, and 160, and a drive unit 170 for driving the air ducts 140 so as to vary the passage directions of the air ducts 140.

[0039] The above-mentioned air conditioner includes an outdoor unit (not shown) and an indoor unit connected by a refrigerant circulating cycle to the outdoor unit integrally formed from or separated from the outdoor unit.

[0040] According to the present invention, an air suction opening 111a and an air discharge opening 111b are provided in the cabinet 110, especially, in a front cover 111 installed in the front surface of the cabinet. The air discharge opening 111b is selectively opened and closed, for example, according to the operation state of a louver 112 and a vane 113, so that the wind can be restrictively redirected through the change of the right or left wind direction and the change of the upward or downward wind direction.

[0041] The fan motor unit 130 (131 and 132), the air ducts 140, 150, and 160, and the drive unit 170 are the elements constituting the apparatus for redirecting wind, and the fan motor unit 130 includes the centrifugal fan driven and rotated by the fan motor 132 supported by the cabinet 110 or the air ducts 140, 150, and 160.

[0042] The centrifugal fan 131 faces a heat exchanger 120 and is installed adjacent to the inner side thereof. The exterior (or interior) air is sucked by the rotation of the centrifugal fan 131 to pass through the heat exchanger 120 to discharge the cool air.

[0043] According to the present invention, at least one centrifugal fan 1231 is installed in parallel and an air duct is installed so as to correspond to the centrifugal fan 131 to form a unit.

[0044] The air ducts 140, 150, and 160 form passages by cooperating an orifice 140, a plurality of passage guides 150, and a scroll guide 160. The orifice 140 is disposed on the inner side of the cabinet 110 and a through-hole 141 allowing penetration of the centrifugal fan 131 is formed in the orifice 140.

[0045] The plurality of passage guides 150 is disposed at different positions, with the plurality of air discharge openings 111b provided in the cabinet 110 being exposed, to form a portion of a partition wall dividing the air discharge passage.

[0046] The plurality of passage guides 150 are formed by machining a metal panel or a resin panel so as to have various shapes according to passage forming patterns and can be embedded in the cabinet 110.

[0047] As shown in FIGs. 5A and 5B, the scroll guide 160 surrounds the circumferences of blades of the centrifugal fan 131 and includes a cylindrical body 161 in which a space for installing the centrifugal fan 131 is

formed and a rectangular pipe type discharge section 162 protruding to the one side of the body 161. The end portion of the discharge section 162 is formed, a cool air discharge opening 163 communicated with the exterior being opened.

[0048] Further, a partition wall panel 164 is installed on one side of the cylindrical body 161 and the other side thereof makes contact with the orifice 140 in an opened state to form an air duct.

[0049] As shown in FIG. 3, the cool air discharge opening 163 of the scroll guide 160 is arranged with and communicated with the front cover 111, the orifice 140, the air discharge opening 111b opened by the plurality of passage guides 150.

[0050] The drive unit 170 is adapted to drive and rotate the scroll guide 160, and includes a drive motor 171 supported by a rear surface plate of the cabinet 110, a driving gear (a pinion 172) installed at the output shaft end of the drive motor 171, a driven gear (an annular rack gear 173) installed on the outer peripheral surface of the cylindrical body 161 of the scroll guide 160, and a guide section 174 installed in the rear surface plate of the cabinet 110 so as to support the scroll guide 160 in a rotatable state.

[0051] According to a preferred embodiment of the present invention, it is preferable that the driven gear 173 is installed so that the annular rack gear is disposed along the circumference of the outer peripheral surface of the cylindrical body 161 of the scroll guide 160 as shown in the figures.

[0052] Meanwhile, the driven gear (the rack gear 173) can be installed in the state in which it is integrally formed with the circumference of the outer peripheral surface of the cylindrical body 161 of the scroll guide 160. On the other hand, it can be installed in the state in which the separately formed annular rack gear is engaged with the circumference of the outer peripheral surface of the cylindrical body 161 of the scroll guide 160 using a general engagement member such as a screw, a bolt, a nut and the like.

[0053] The guide section 174 is adapted to smoothly rotate the scroll guide 160. It is preferable that, as shown in FIGs. 5A and 5B, the guide section 174 includes a guide rib 174a protruding from the circumference of the rear partition wall panel 164 of the scroll guide 160, a guide rail 174b provided in the guide rib 174a, a support bar 174c protruding from the cabinet 110, and a roller member 174d provided at the tip end of the support bar 174c so as to engaged with the guide rail 174b to guide the rolling motion.

[0054] According to another preferred embodiment of the present invention, the guide section 174 can include a guide rib 174a protruding from the circumference of the rear partition panel 164 of the scroll guide 160 and a support bar 174c protruding from the cabinet 110 so as to make contact with the inner side of the guide rib 174a to support the entire body of the scroll guide 160.

[0055] Further, according to a preferred embodiment

of the present invention, the drive unit 170 can be constituted in a chain or belt drive method. In other words, referring to FIG. 6, the driven gear (a sprocket 175) can be installed in the rear partition panel 164 of the scroll guide 160 so as to be supported, and the driving gear 177 installed at the output shaft end of the drive motor 171 and the driven gear 175 can be connected to each other by a chain (or a timing belt 178) so as to be moved in connection with each other.

[0056] According to another preferred embodiment of the present invention, although not shown in the figures, a rotational shaft (not shown) is installed at a central portion of the rear partition panel of the scroll guide 160, and a direct rotation driving method in which the rotational shaft is connected to the output shaft of the drive motor can be applied to the present invention. In applying the preferred embodiment of the present invention, the drive shaft of the fan motor and the rotational shaft of the scroll guide can be eccentrically installed.

[0057] On the other hand, for example, the rotational shaft of the hollow scroll guide has a hollow shape having a predetermined inner diameter and the fan motor and the drive shaft can be coaxially installed so that they are embedded in the hollow portion.

[0058] The present invention is not limited to the described structures of the drive units according to the preferred embodiments and can employ various well-known drive means which can rotate the scroll guide 160.

[0059] Hereinafter, the operation and wind redirecting state of the air conditioner and the apparatus for redirecting wind according to the present invention will be described with reference to the attaching drawings.

[0060] The air conditioner and the apparatus for redirecting wind according to the present invention rotates the centrifugal fan 131 to suck the interior air through the air suction opening 111a of the front cover 111 according to the operation principle of a general cooling air conditioning cycle as the operation of a user starts. The sucked air is cooled to generated cool air when it passes through the heat exchanger 120 to be introduced.

[0061] The cool air generated as mentioned above discharged into the interior space through the orifice 140, the plurality of passage guides 150, and the air duct in which a passage is formed by the scroll guide 160 to perform the cooling function. Then, the wind direction of the discharged cool air can be redirected in a wanted direction by controlling the setting position of the cool air discharge opening 163 by the rotational movement of the scroll guide 160 constituting the variable air duct according to the present invention. Herein after the operation will be described in detail.

[0062] If one of various wind direction modes input in advance by the manipulation of, for example, a remote controller or a control panel in order that the user redirects the wind of the air conditioner, input signals are transmitted to a control unit (a microcomputer (not shown)) to control the drive of the drive unit 170 and thus the conversion operation to the wind direction mode selected by

the user is performed.

[0063] Namely, as shown in FIG. 5A, the drive motor 171 and the drive gear 172 of the output shaft end are driven and rotated in connection with each other. Accordingly, as the driving gear 172 and the driven gear 173 engaged with the driving gear 172 is moved in connection with each other, the scroll guide 160 is driven and rotated.

[0064] On the other hand, in the case in which the drive unit of the chain or belt drive method as shown in FIG. 6 is employed, the scroll guide 160 is moved in connection and is driven and rotated by a predetermined angle as the rotational force and rotation amount of the driving gear 177 of the drive motor 171 is transferred to the driven gear 175.

[0065] Then, as the rotational speed of the drive motor 171 is controlled according to the control signals of the control unit (the microcomputer), the rotation angle of the scroll guide 160 is determined. Accordingly, as the setting position of the cool air discharge opening 163 is determined according to the rotation state of the scroll guide 160 the position of which is finally determined, the wind direction is redirected in a direction wanted by the user.

[0066] According to the present invention, the scroll guide 160 has a rotation range of 360 degrees.

[0067] On the other hand, the cool air discharge opening 163 of the scroll guide 160 is arranged with the air discharge opening 111b opened by the cabinet 110 and the plurality of passage guides 150 so as to be communicated with each other.

[0068] FIGs. 7A and 7D shows examples of various wind direction modes in which the wind is redirected by controlling the rotation angle of the scroll guide 160 so that the cool air discharge opening 163 of the scroll guide 160 and the air discharge opening 111b provided in the cabinet 110 and the plurality of passage guides 150 are arranged with each other so as to be communicated with each other and then converting the setting position of the cool air discharge opening 163.

[0069] According to one aspect of the present invention, various kinds and types of wind direction mode combinations can be set by providing the air discharge opening 111b formed by the cabinet 110 and the plurality of passage guides 150 at various positions and controlling the setting position of the cool air discharge opening 163 so that the air discharge opening 111b and the cool air discharge opening 163 of the scroll guide 160 are arranged with each other according to the position of the air discharge opening 111b so as to be communicated with each other.

[0070] Therefore, according to the air conditioner and the apparatus for redirecting wind, in the case in which the wind direction of the cool air discharged from the air duct in the interior of the cabinet 110 to the outside by selectively controlling the opening/closing state of the louver 112 installed in the front cover 111 and the vane 113, the wind amount efficiency and the cooling efficiency due to the concentration of the wind direction and the wind amount can be improved by varying the cool air

discharge opening 163 of the scroll guide 160 so that the cool air discharge opening 163 can face the air discharge opening 111b in which the louver 112 and/or the vane 113 is opened.

[0071] On the other hand, according to another preferred embodiment of the present invention, as shown in FIG. 8, at least two cool air discharge openings 163 and 163a can be provided in the scroll guide 160.

[0072] Therefore, according to the preferred embodiment shown in FIG. 8, as shown in FIG. 9, since the plurality of cool air discharge openings 163 and 163a can discharge the cool air in different directions even at a setting position of the scroll guide 160 according to one wind direction mode, various kinds and types of wind direction mode combinations can be set, thereby pursuing various functions of the product.

[0073] On the other hand, in the preferred embodiments of the present invention, although the constitution including a pair of centrifugal fans 131 and a pair of air ducts provided at the circumference of the centrifugal fans 131 is exemplified, even in the constitution in which one or at least three centrifugal fans are installed, the structure of the variable duct formed by the scroll guide which can be controlled to be driven and rotated can be applied to the substantially same type.

[0074] Further, the air duct structure (the structure having the scroll guide which can be controlled so as to be rotated) according to the present invention can be applied not only to a product model such as the frame type air conditioner, the hanger type air conditioner, and a window type air conditioner as shown in FIGs. 3 and 4 but also a variable air duct structure which is of the substantially same type can be applied to, for example, an indoor unit of a stand type air conditioner.

[0075] Further, the air conditioner and the apparatus for redirecting wind according to the present invention exemplify the case in which they are applied to an indoor unit of the air conditioner for cooling, they can be also effectively applied to indoor units of a separation type air conditioner and a integration type air conditioner and to an outdoor unit for the separation type air conditioner, an outdoor unit for the integration type air conditioner, and indoor and outdoor units of a heater.

[0076] As mentioned above, the air conditioner and the apparatus for redirecting wind according to the present invention can obtain the following effects.

[0077] First, since the initially designed duct passage pattern can be converted to various types of wind direction modes according to selection of the operation mode of a user, the efficiency can be remarkably improved by the optimization of the wind amount and the wind direction.

[0078] Second, since when the cool air discharged from the air duct to the outside of the cabinet is redirected, the discharged cool air is restrained so as to minimize the compulsory interruption and leakage of the discharged air according to the opening/closing state of the louver and the vane, the noise generating factors are

removed, thereby improving the efficiency and reliability of the product.

[0079] Third, as the degree of freedom to the control of the wind direction angle of the discharged air is improved, various functions of the product can be obtained.

Claims

1. An apparatus for redirecting wind in an air conditioner, the apparatus comprising:
 - a fan motor unit for sucking and discharging exterior air so that the exterior air can be heat-exchanged by a heat exchanger embedded in a cabinet;
 - an air duct installed in the cabinet so as to form an air passage at the circumference of the fan motor unit, for guiding the air discharge direction; and
 - a drive unit for varying the position of a discharge opening of the air duct.
2. The apparatus according to claim 1, wherein the fan motor unit comprises:
 - a centrifugal fan installed so as to face the heat exchanger; and
 - a drive motor for driving and rotating the centrifugal fan.
3. The apparatus according to claim 1, wherein a plurality of fan motor units are installed so as to face the heat exchanger and to be parallel to each other.
4. The apparatus according to claim 1, wherein the air duct comprises:
 - a plurality of passage guides disposed on the inner side of the cabinet so as to form a plurality of discharge openings; and
 - a scroll guide installed around the fan motor unit so as to form an air discharge passage by cooperating with the plurality of passage guides.
5. The apparatus according to claim 4, wherein the scroll guide has a plurality of air discharge openings.
6. The apparatus according to claim 1, wherein the drive unit comprises:
 - a drive motor installed so as to be supported by the cabinet;
 - a drive gear installed at an output shaft of the drive motor;
 - a driven gear installed at the outer periphery of the air duct so as to be engaged with the drive gear; and

- a guide section installed in the cabinet so as to support the air duct in a movable state.
7. The apparatus according to claim 6, wherein an annular rack gear is disposed along the outer peripheral surface of the air duct in the driven gear. 5
8. The apparatus according to claim 1, wherein the drive unit comprises:
- a drive motor installed so as to be supported by the cabinet;
- a drive gear provided at an output shaft end of the drive motor;
- a sprocket installed in the air duct;
- a chain installed so as to travel on an endless track and connecting the drive gear and the sprocket; and
- a guide section installed in the cabinet so as to support the air duct in a movable state. 20
9. The apparatus according to claim 6 or 8, wherein the guide section comprises:
- a guide rib protruding from the circumference of the body of the air duct; and
- a support bar installed so as to protrude from the cabinet and making contact with the inner side of the guide rib to support the air duct. 25
10. The apparatus according to claim 6 or 8, wherein the guide section comprises:
- a support bar installed so as to be supported by the cabinet;
- a guide rail provided in the body of the air duct; and
- a roller member provided at the tip end of the support bar so as to be mutually engaged with the guide rail to be moved. 30
11. An air conditioner comprising:
- a cabinet having an air suction opening and a discharge opening;
- a heat exchanger embedded in the cabinet;
- a fan motor unit installed so as to face the heat exchanger, for sucking and discharging exterior air;
- an air duct installed in the cabinet so as to form an air passage at the circumference of the fan motor unit, for guiding the air discharge direction; and
- a drive unit for varying the position of a discharge opening of the air duct. 40
12. The air conditioner according to claim 11, wherein the fan motor unit comprises:
- a centrifugal fan installed so as to face the heat exchanger; and
- a drive motor for driving and rotating the centrifugal fan.
13. The air conditioner according to claim 11, wherein a plurality of fan motor units are installed so as to face the heat exchanger and to be parallel to each other.
14. The air conditioner according to claim 11, wherein the air duct comprises:
- a plurality of passage guides disposed on the inner side of the cabinet so as to form a plurality of discharge openings; and
- a scroll guide installed around the fan motor unit so as to form an air discharge passage by cooperating with the plurality of passage guides and having an air discharge opening having an opened side. 45
15. The air conditioner according to claim 14, wherein the scroll guide has a plurality of air discharge openings.
16. The air conditioner according to claim 11, wherein the drive unit comprises:
- a drive motor installed so as to be supported by the cabinet;
- a drive gear installed at an output shaft of the drive motor;
- a driven gear installed at the outer periphery of the air duct so as to be engaged with the drive gear; and
- a guide section installed in the cabinet so as to support the air duct in a movable state. 50
17. The air conditioner according to claim 11, wherein an annular rack gear is disposed along the outer peripheral surface of the air duct in the driven gear.
18. The air conditioner according to claim 11, wherein the drive unit comprises:
- a drive motor installed so as to be supported by the cabinet;
- a drive gear provided at an output shaft end of the drive motor;
- a sprocket installed in the air duct;
- a chain installed so as to travel on an endless track and connecting the drive gear and the sprocket; and
- a guide section installed in the cabinet so as to support the air duct in a movable state. 55
19. The air conditioner according to claim 16 or 18, wherein the guide section comprises:

a guide rib protruding from the circumference of the body of the air duct; and
a support bar installed so as to protrude from the cabinet and making contact with the inner side of the guide rib to support the air duct. 5

20. The apparatus for redirecting wind according to claim 16 or 18, wherein the guide section comprises:

a support bar installed so as to be supported by the cabinet; 10
a guide rail provided in the body of the air duct;
and
a roller member provided at the tip end of the support bar so as to be mutually engaged with the guide rail to be moved. 15

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FIG. 1
(PRIOR ART)

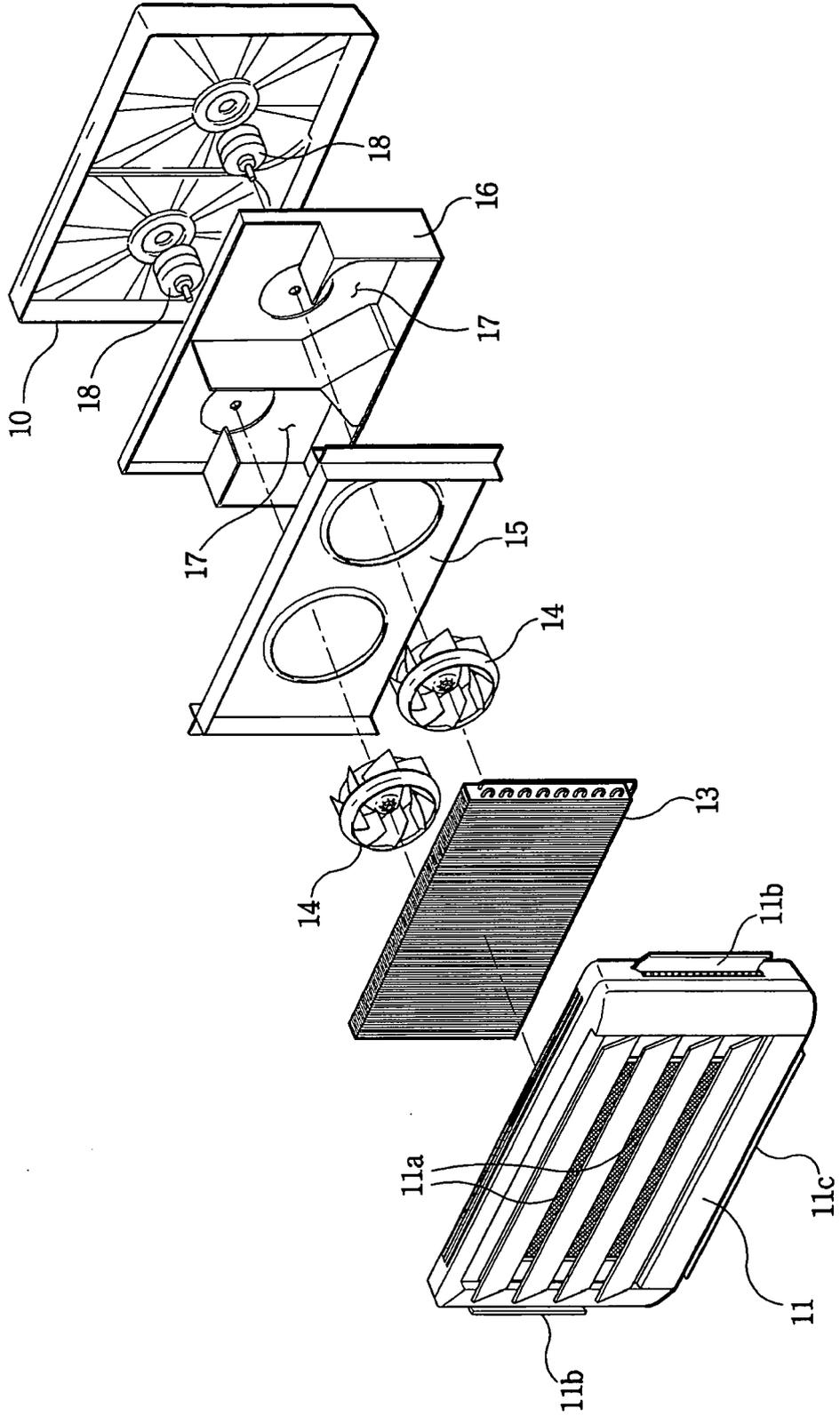


FIG. 2
(PRIOR ART)

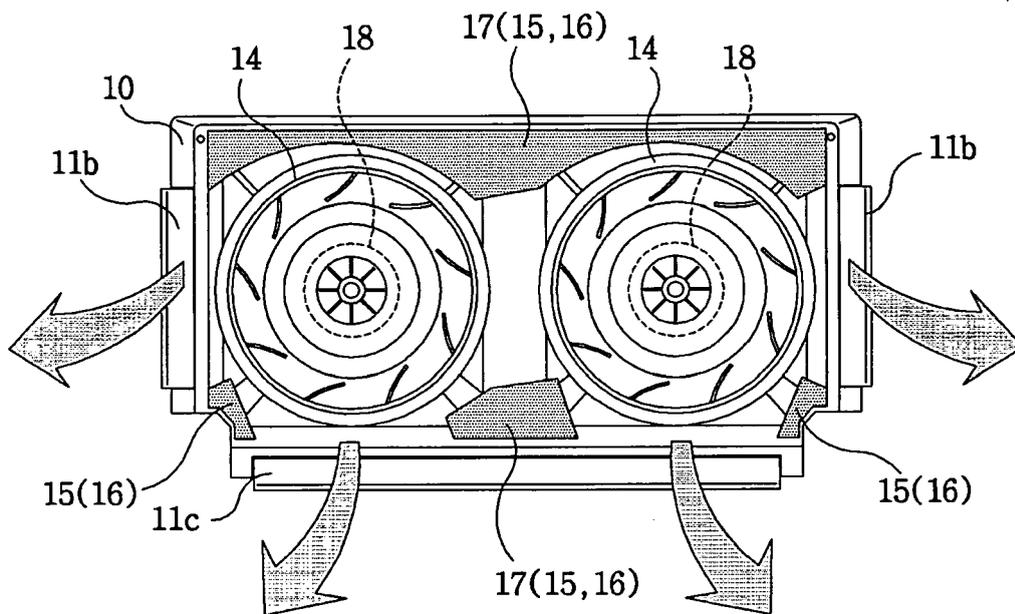


FIG. 4

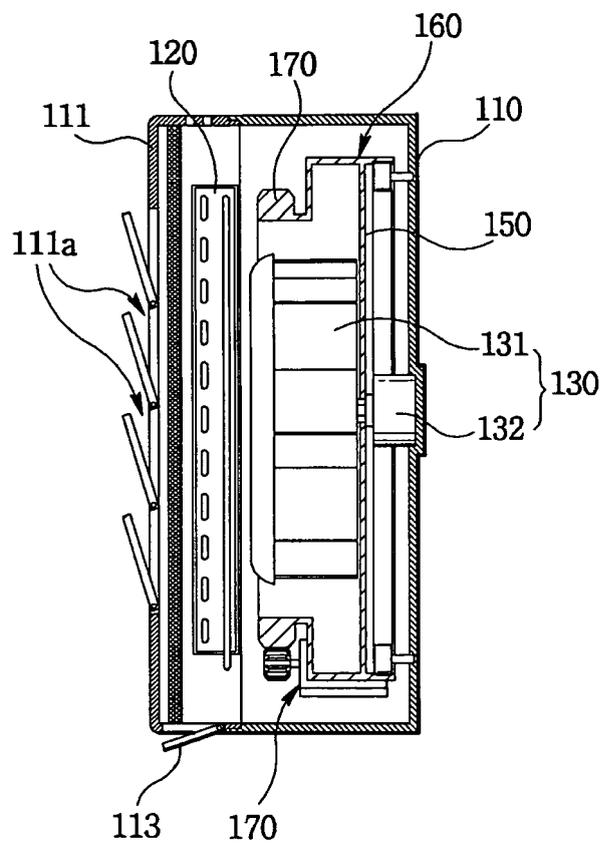


FIG. 5a

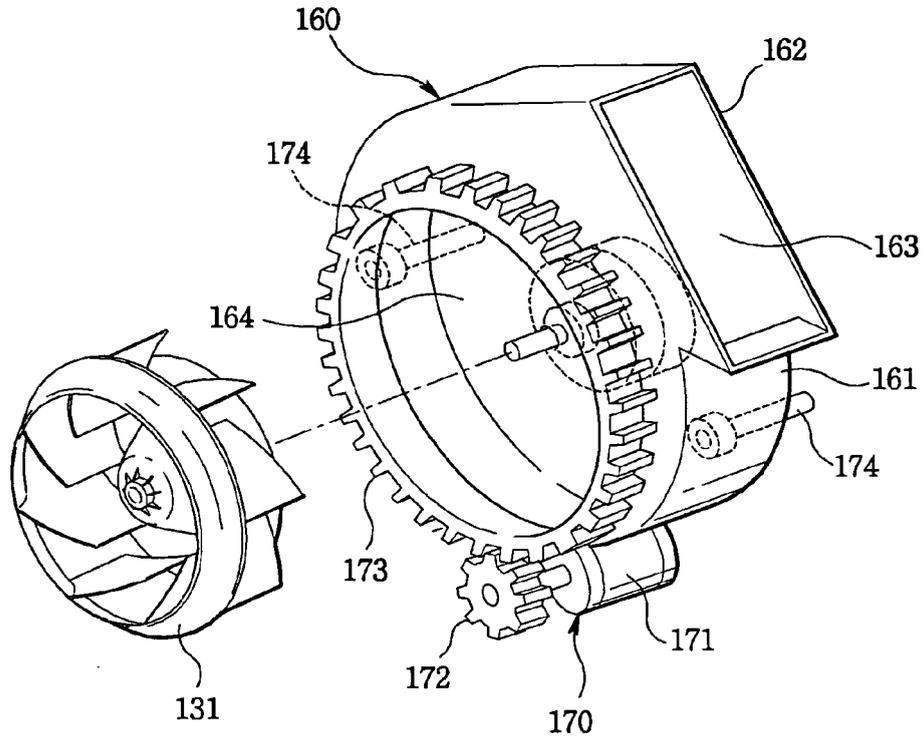


FIG. 5b

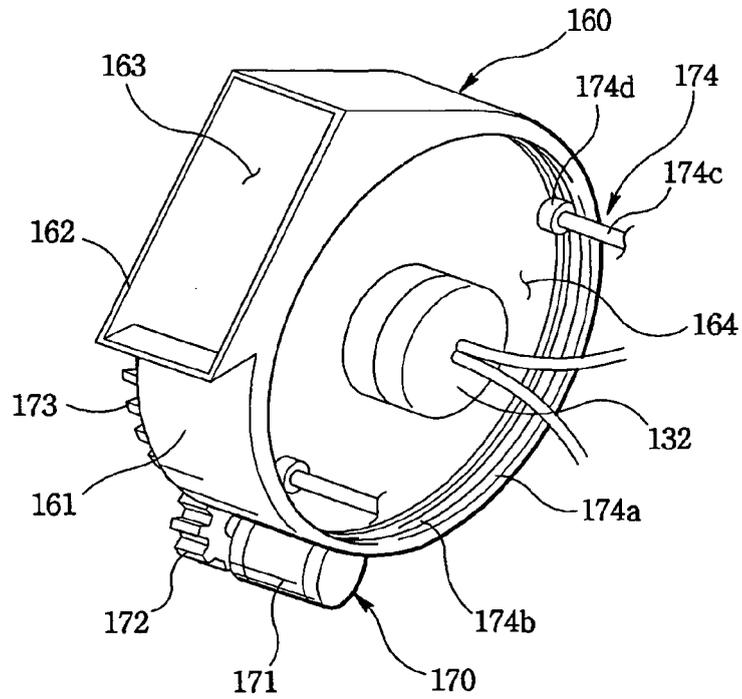


FIG. 6

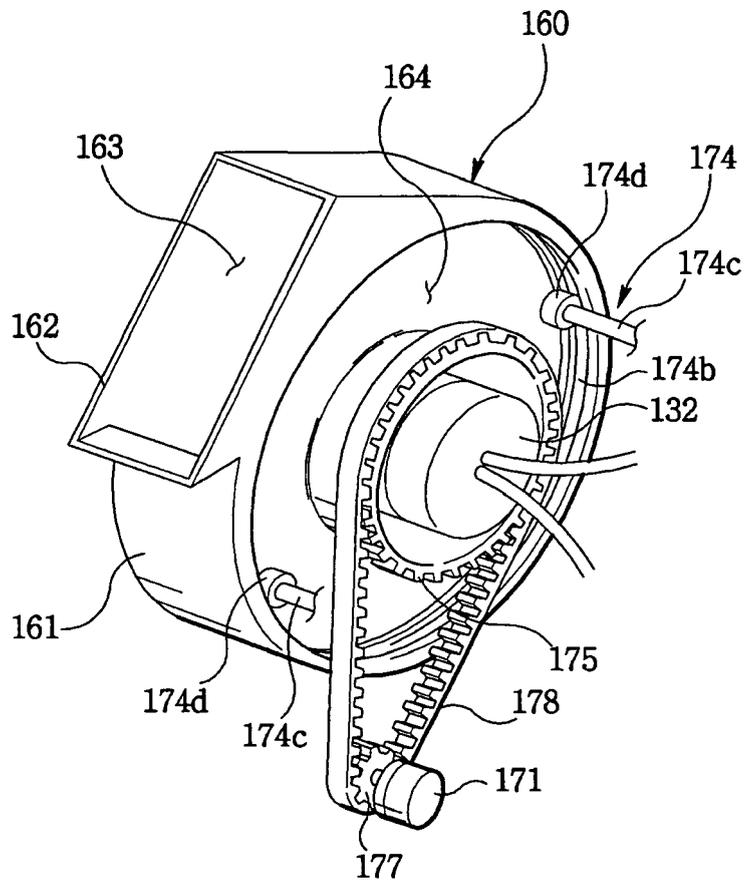


FIG. 7a

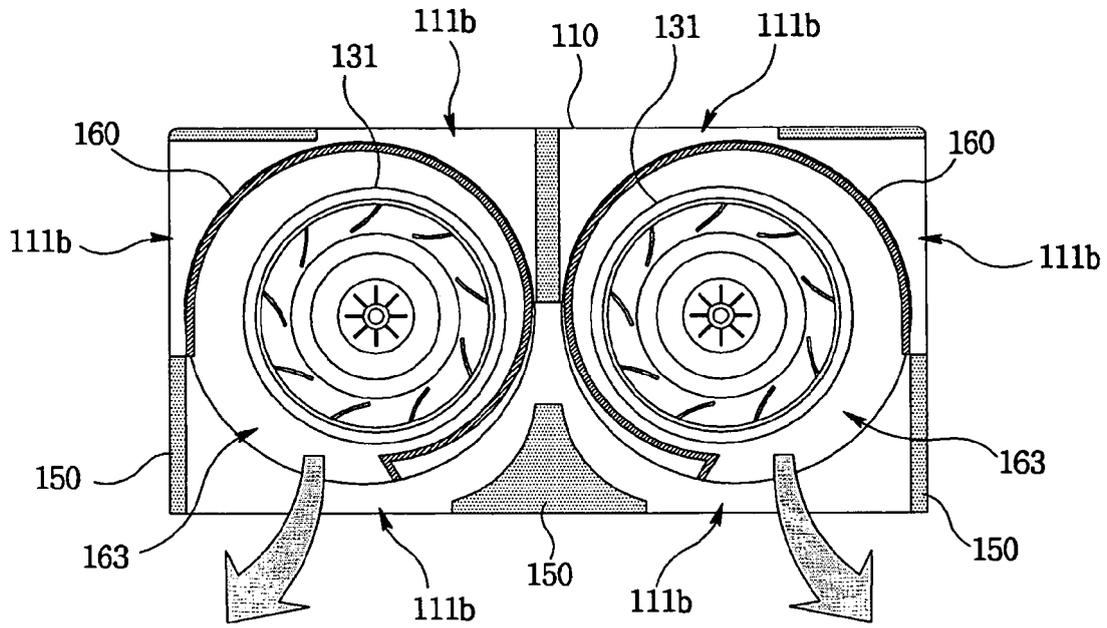


FIG. 7b

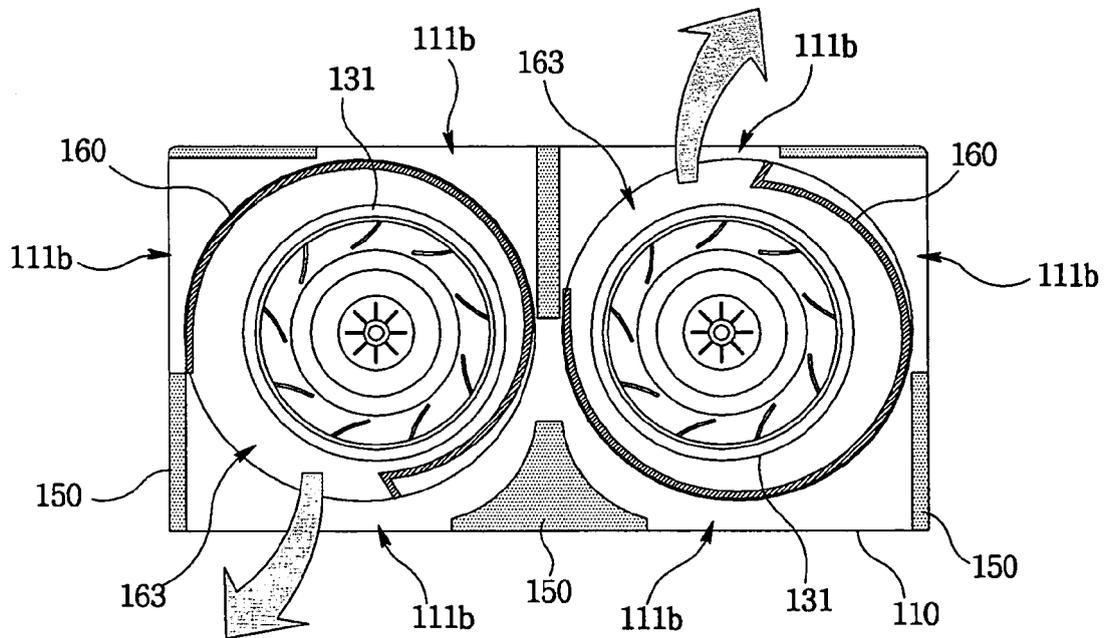


FIG. 7c

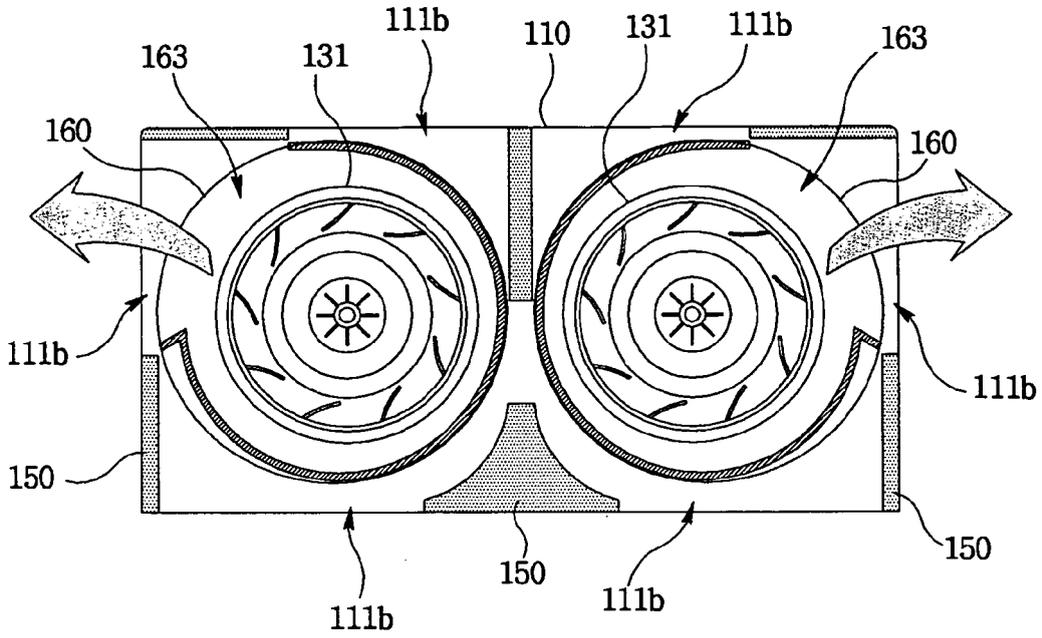


FIG. 7d

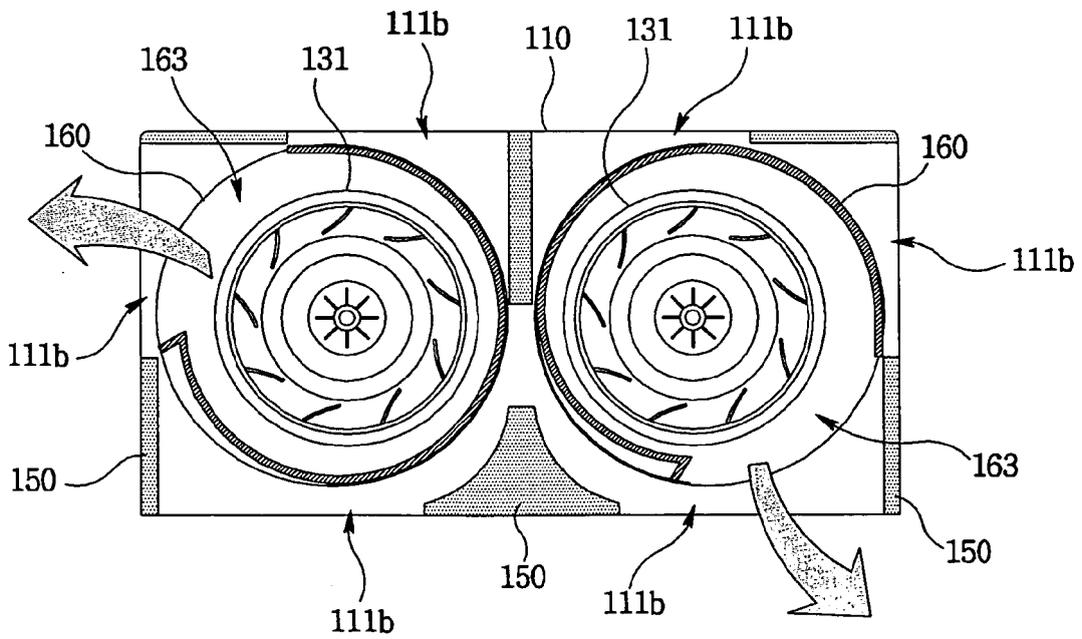


FIG. 8

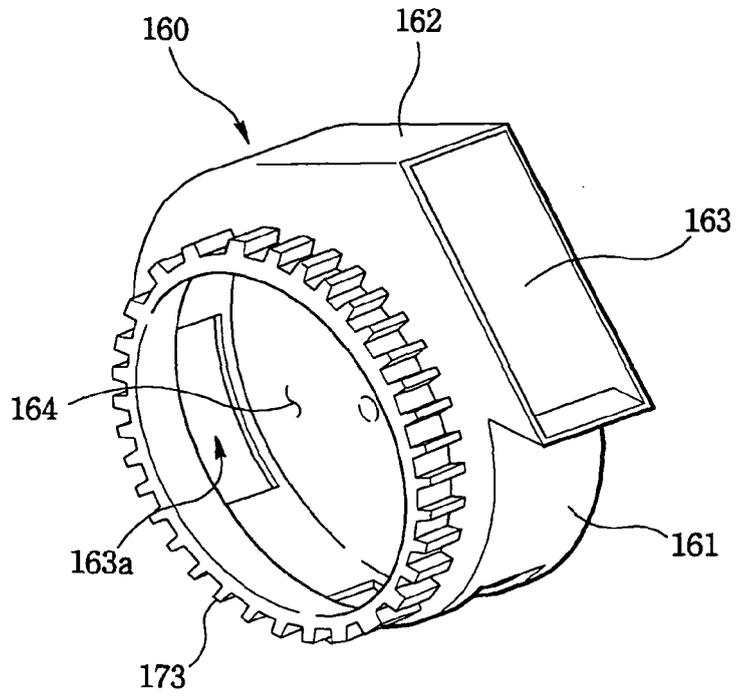
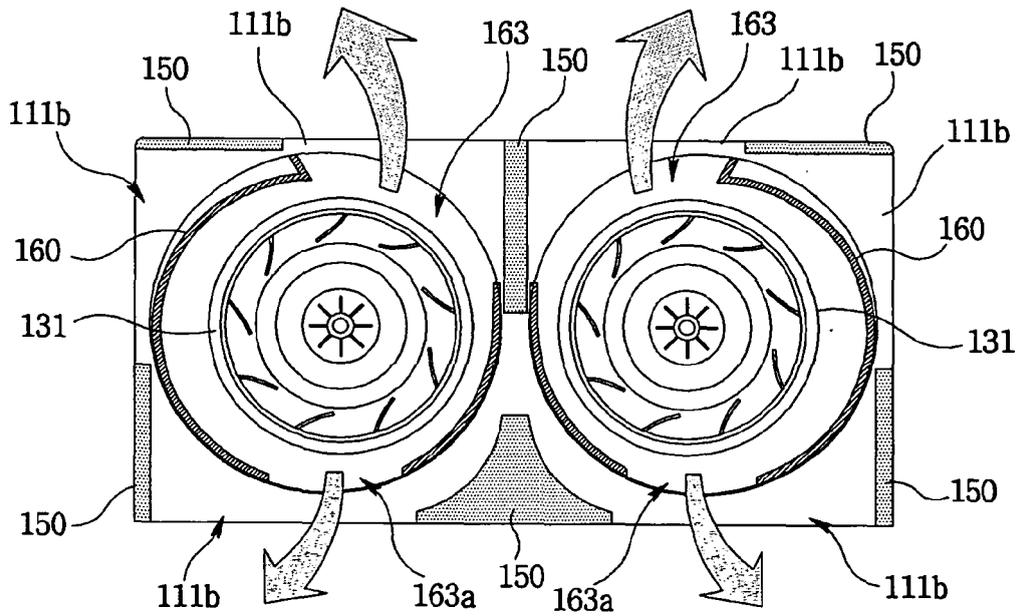


FIG. 9





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<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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