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(54) **AIR CONDITIONER**

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(57) **ABSTRACT**

Air conditioner includes: a housing including an inlet, an outlet, and a discharge port, a blower configured to circulate air into or out of the housing, and a discharge device configured to guide a portion of the air blown toward the outlet by the blower to the discharge port. The discharge device includes a base fixed to the housing and configured to mount a movable drive source and a rotary drive source thereon, a discharge cover configured to open or close the discharge port, the discharge port being movable and rotatable with respect to the base, a movable transmission configured to receive power from the movable drive source to move the discharge cover, and a rotary transmission configured to receive power from the rotary drive source to rotate the discharge cover.

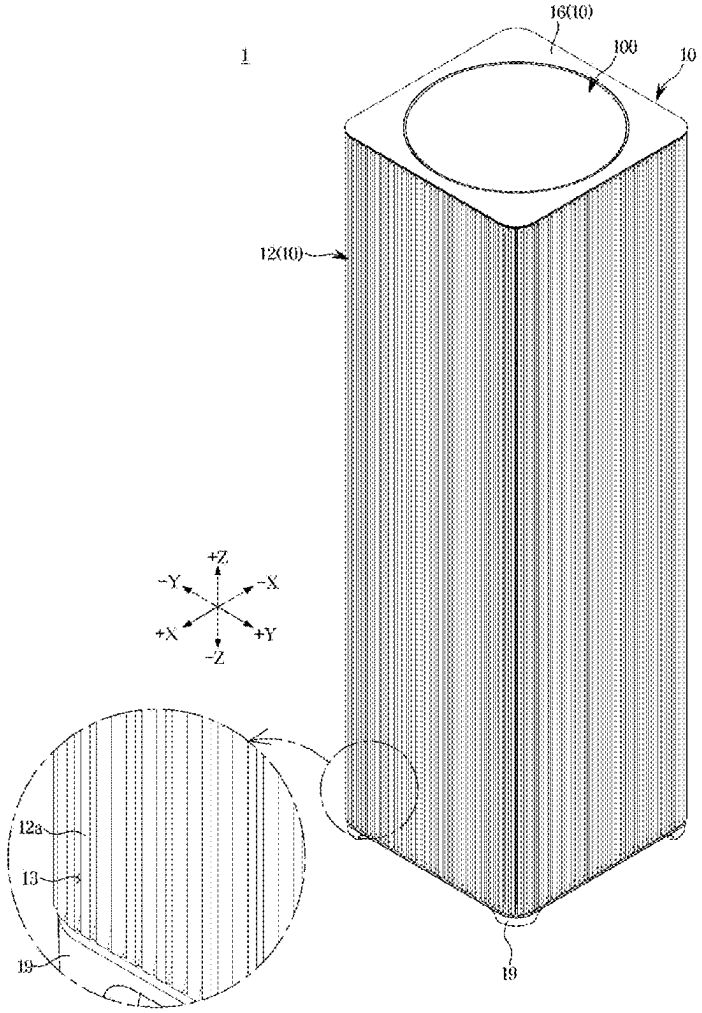

FIG. 1

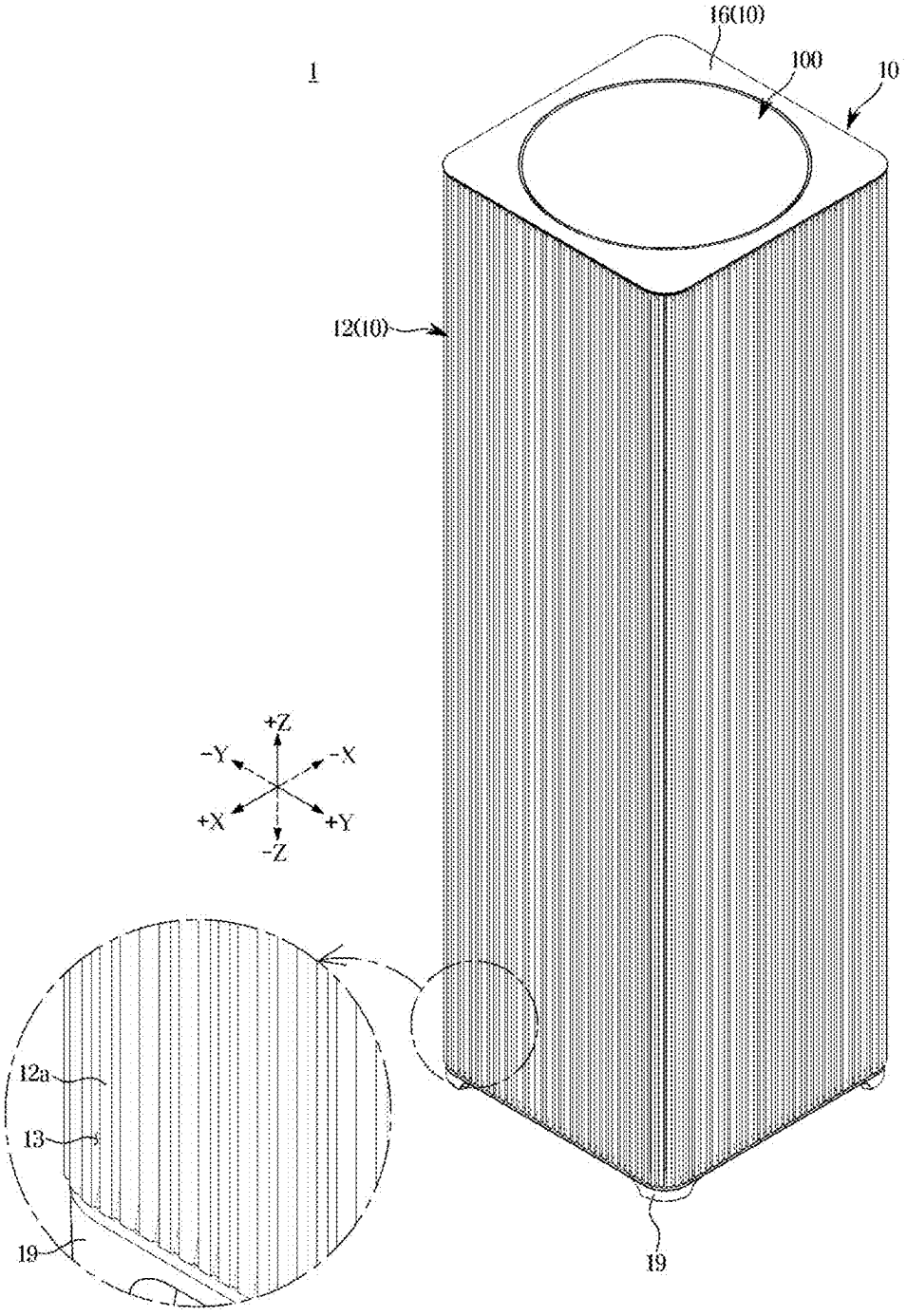

FIG. 2

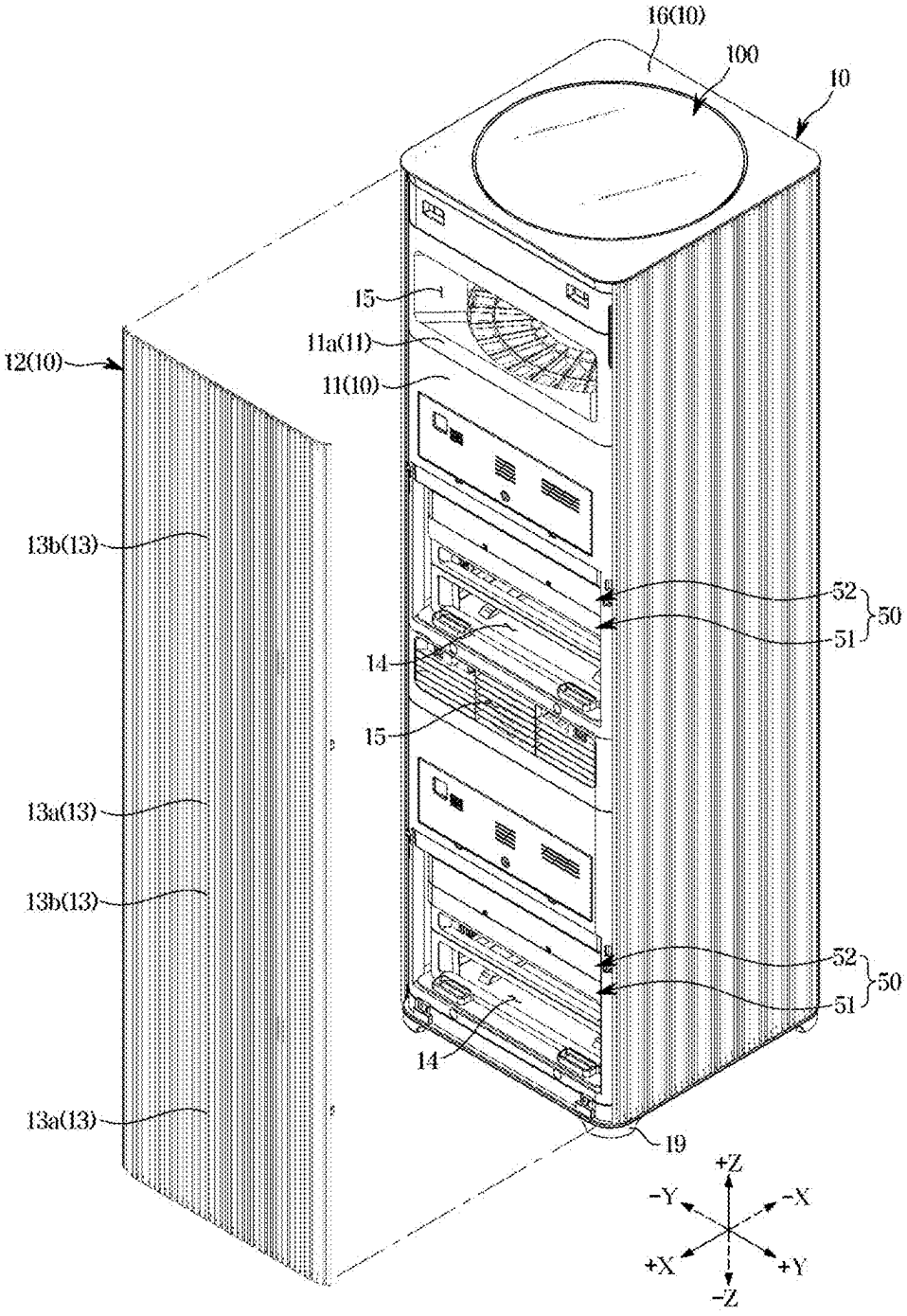
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FIG. 3

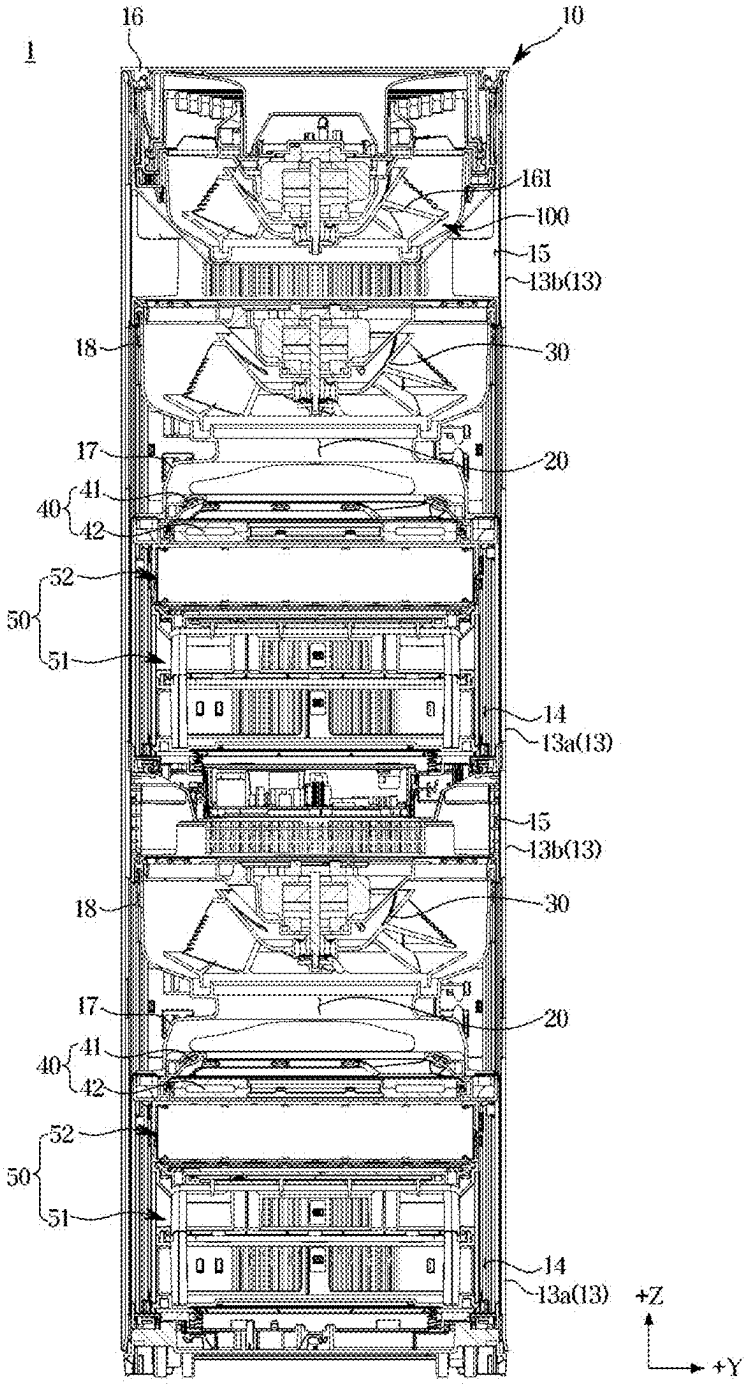
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FIG. 4

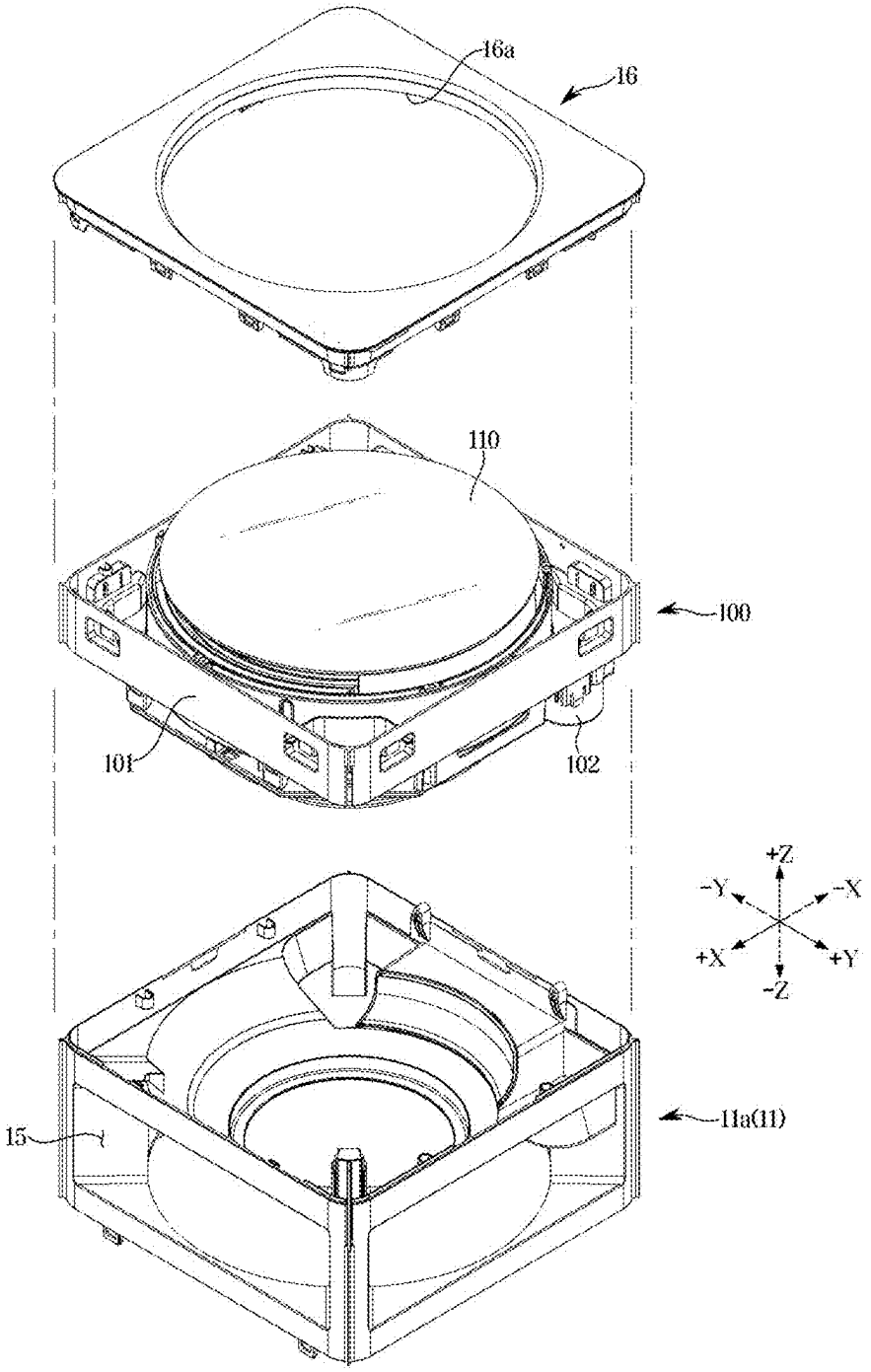

FIG. 5

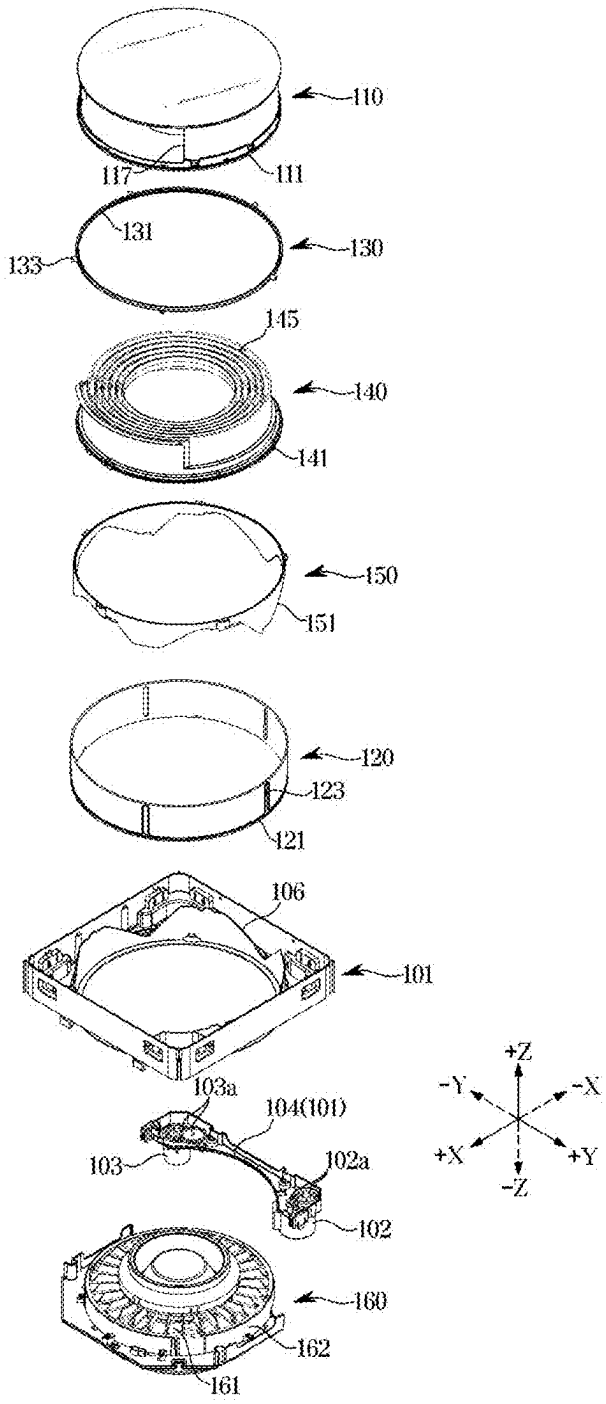
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FIG. 6

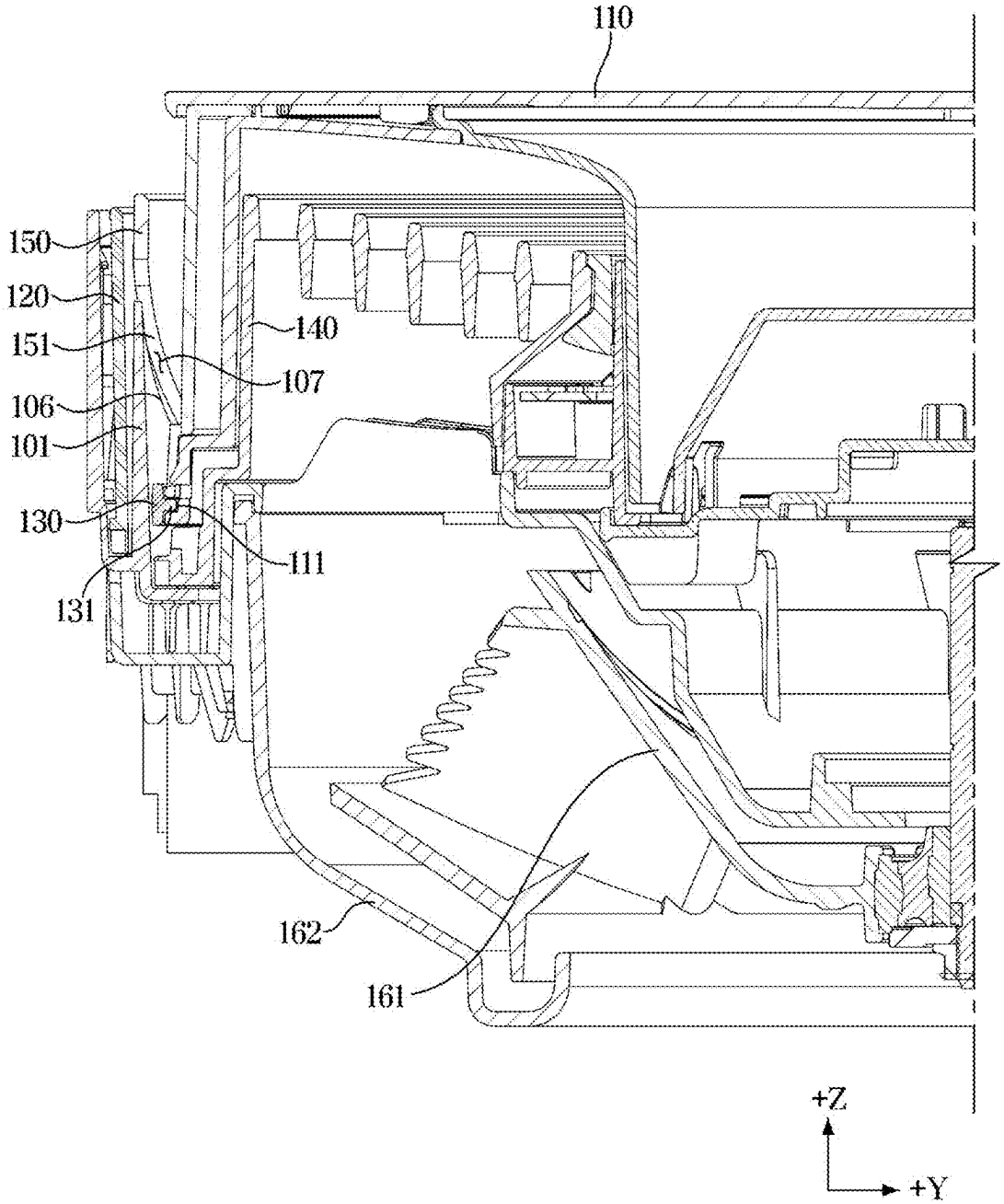


FIG. 7

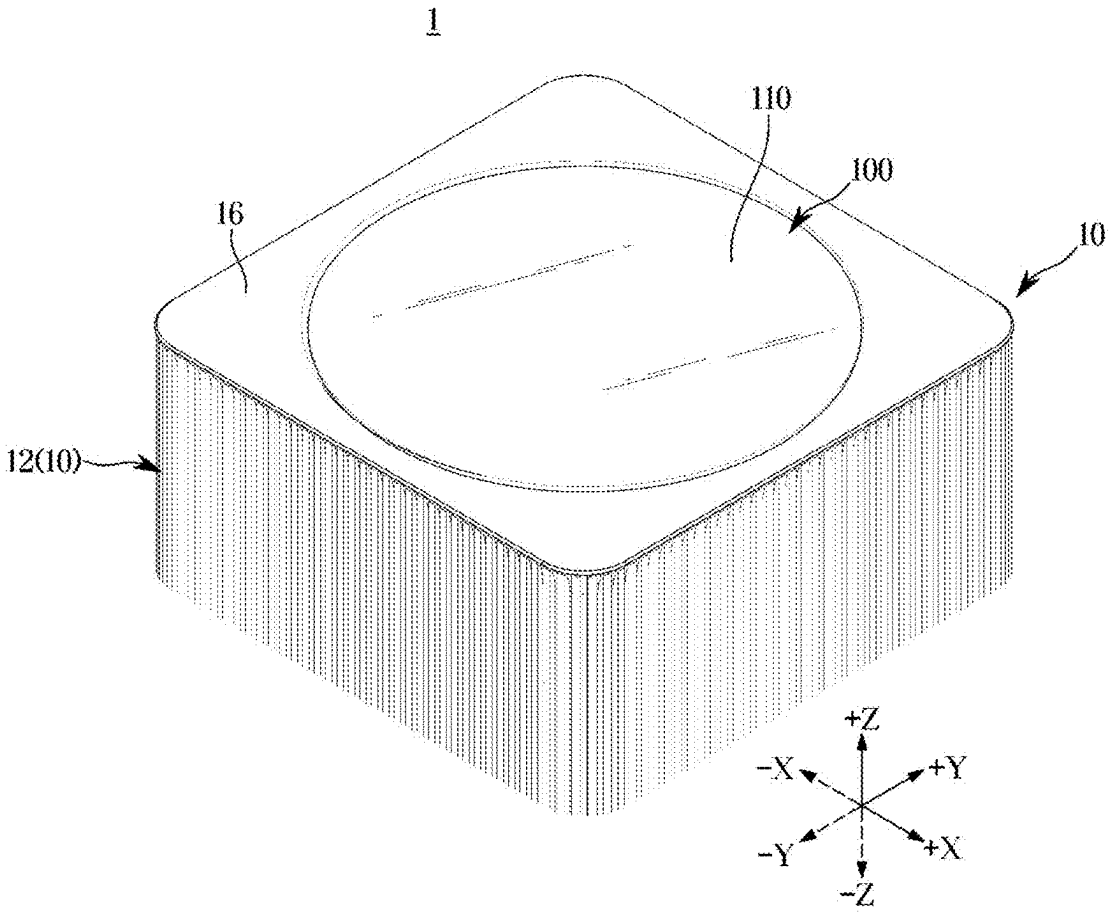


FIG. 8

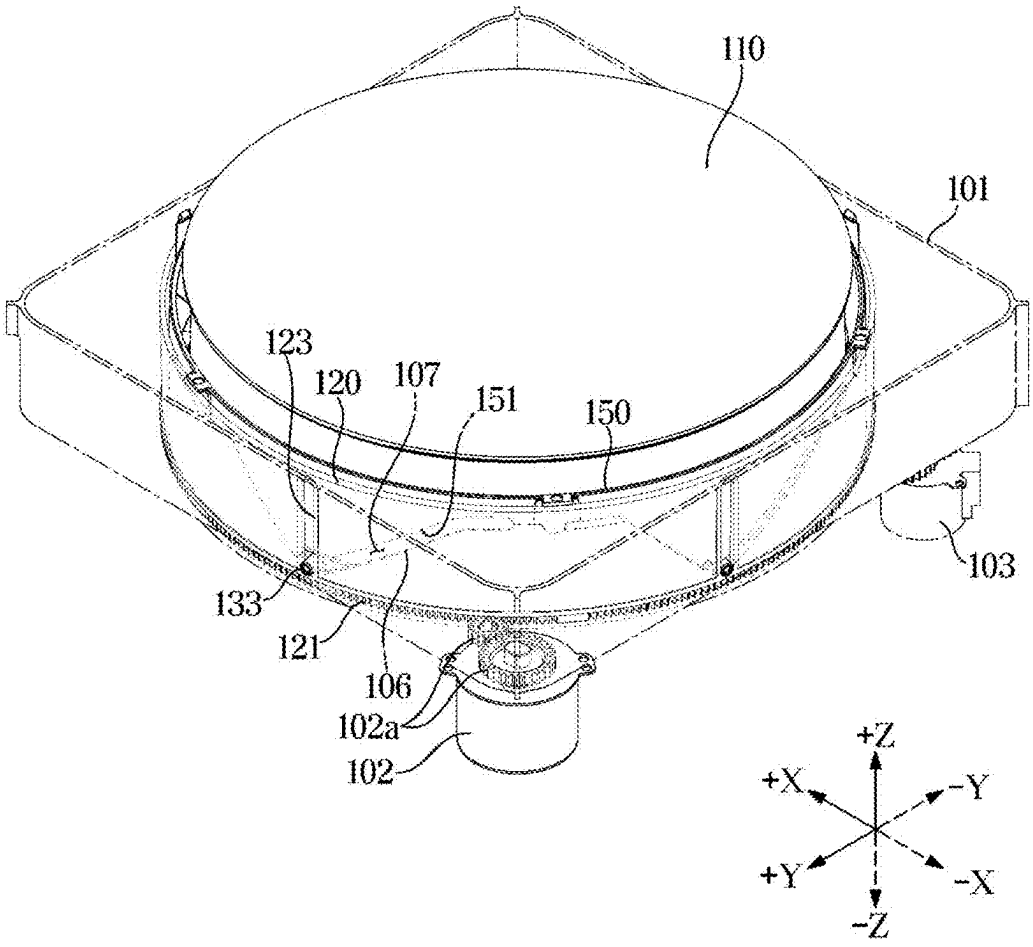


FIG. 9

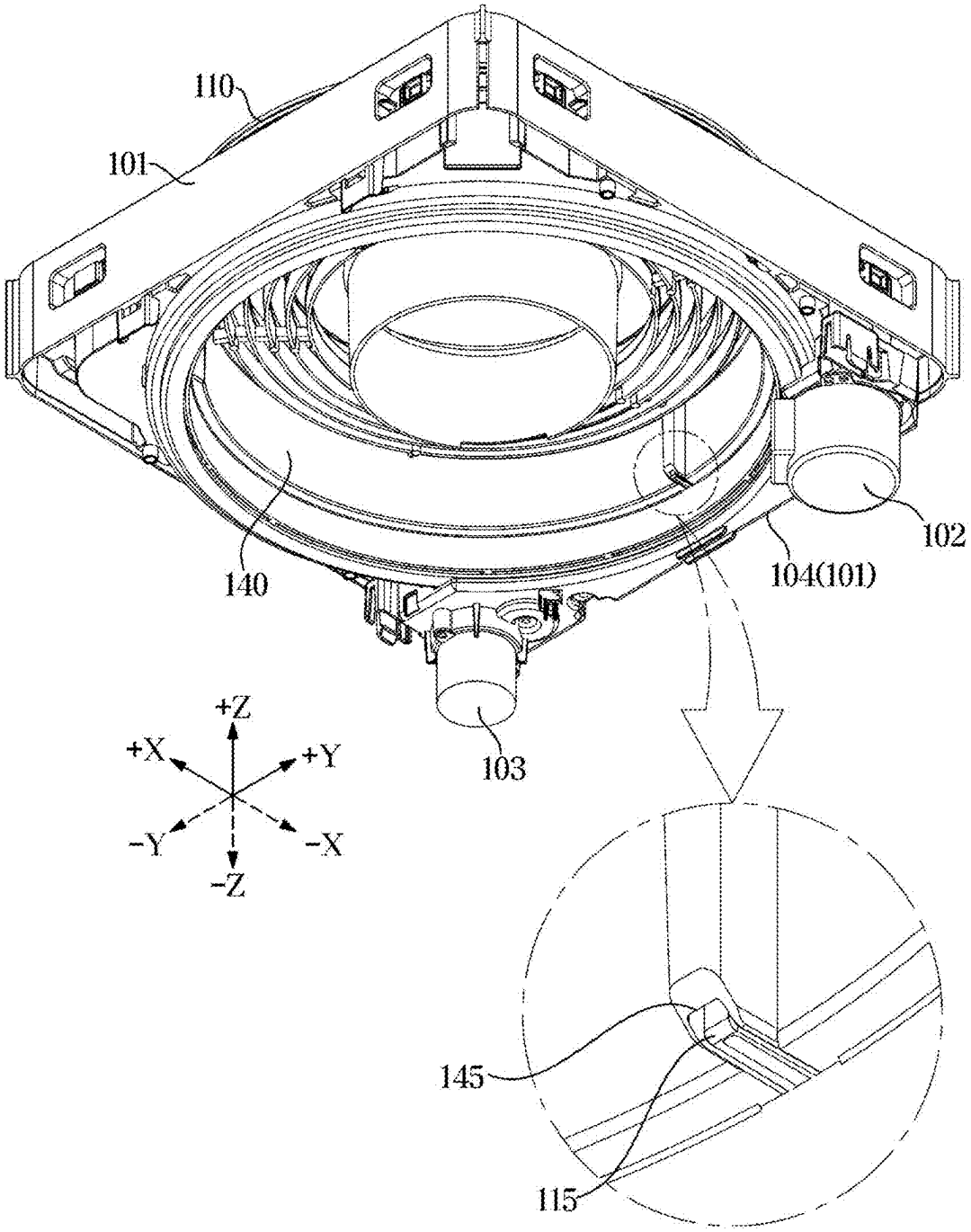


FIG. 10

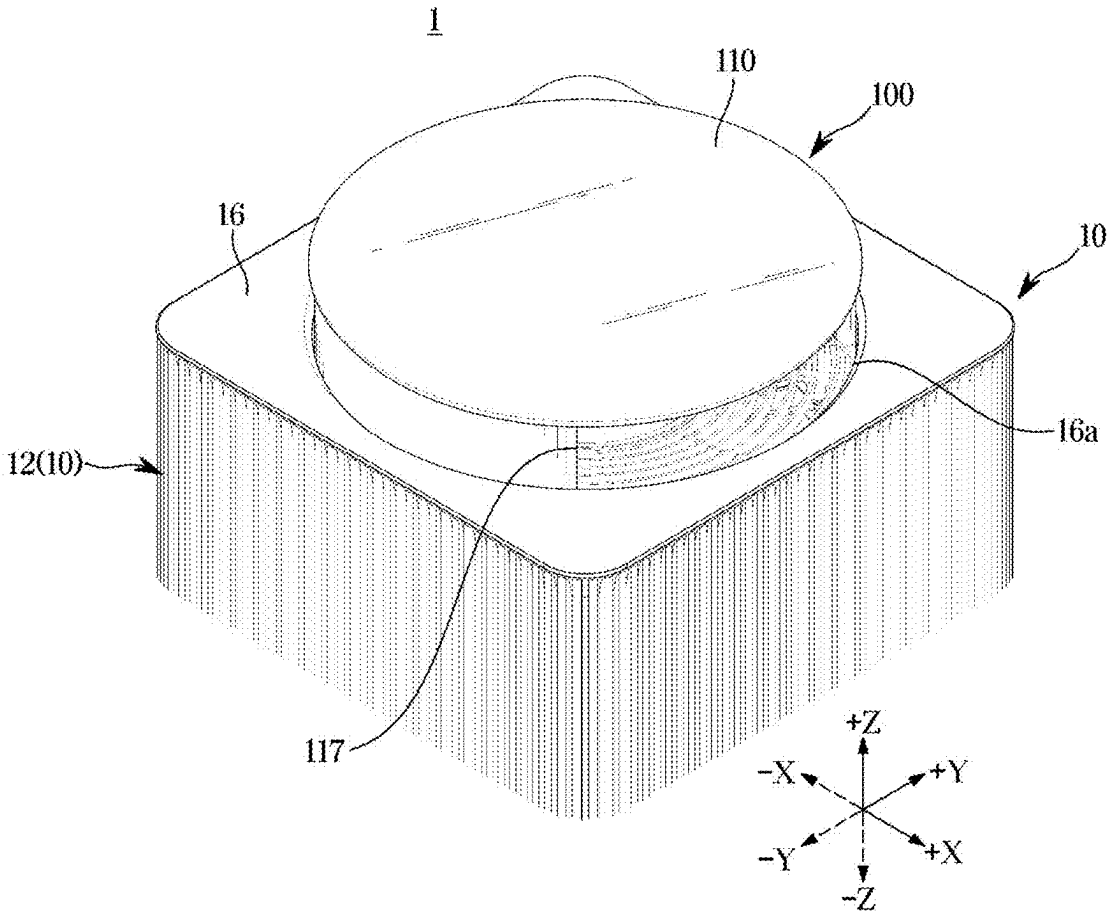


FIG. 11

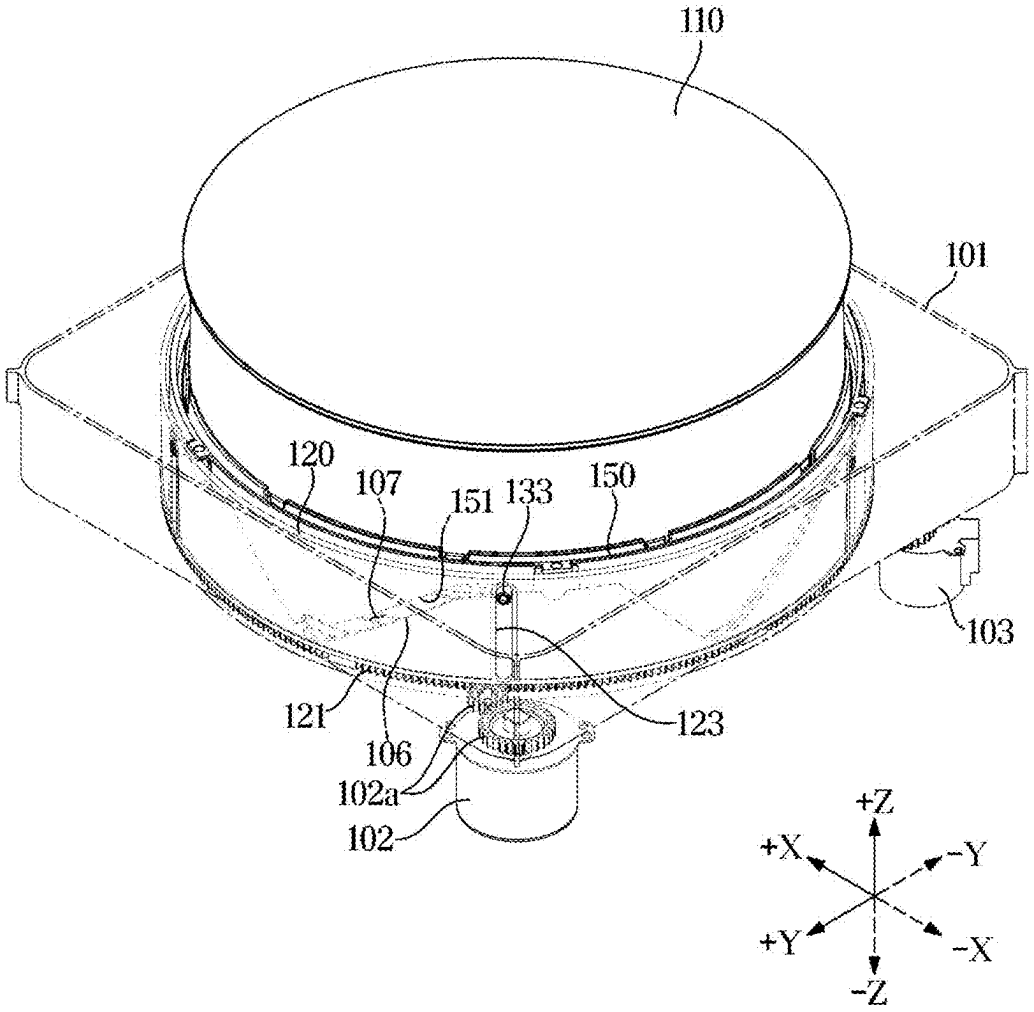


FIG. 12

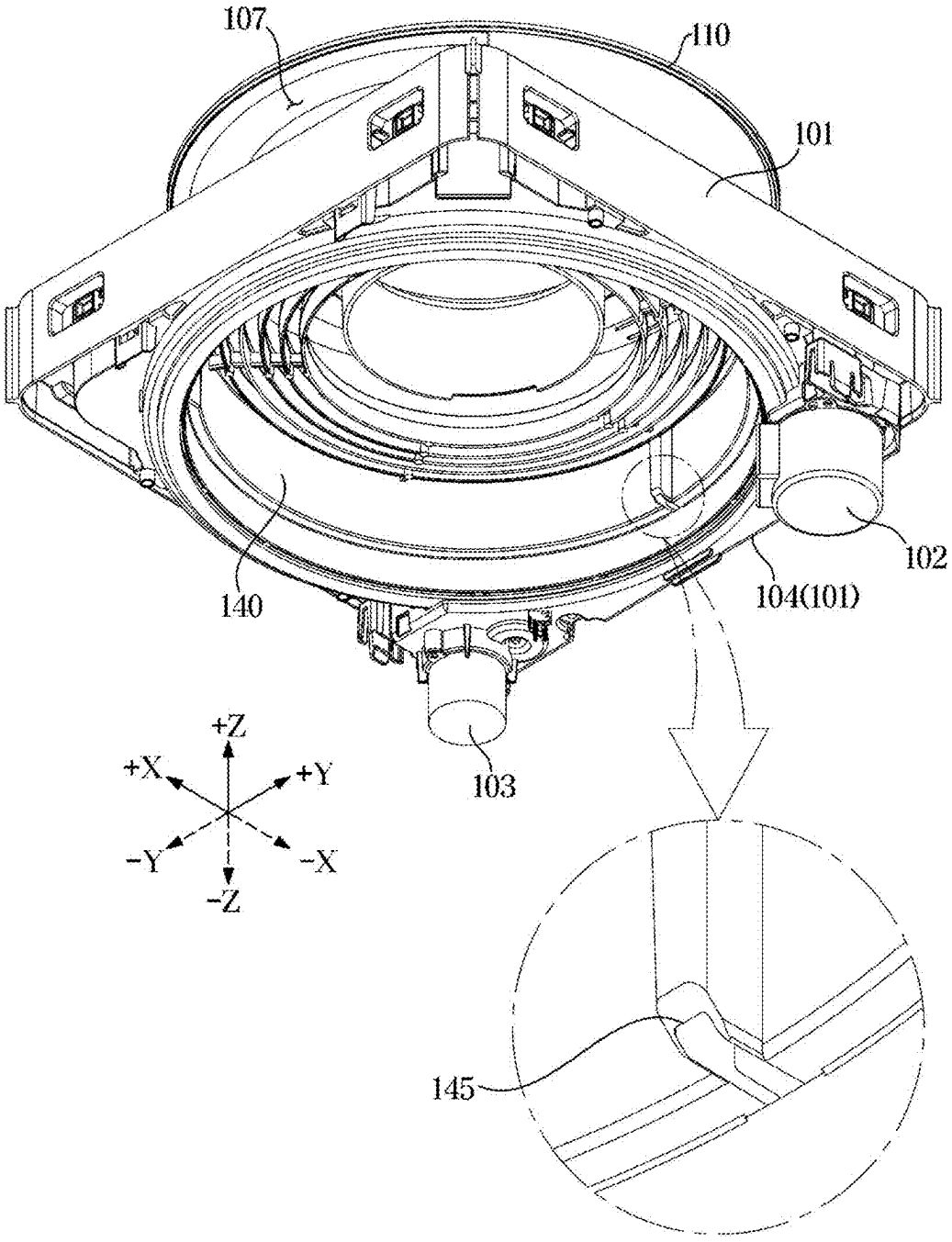


FIG. 13

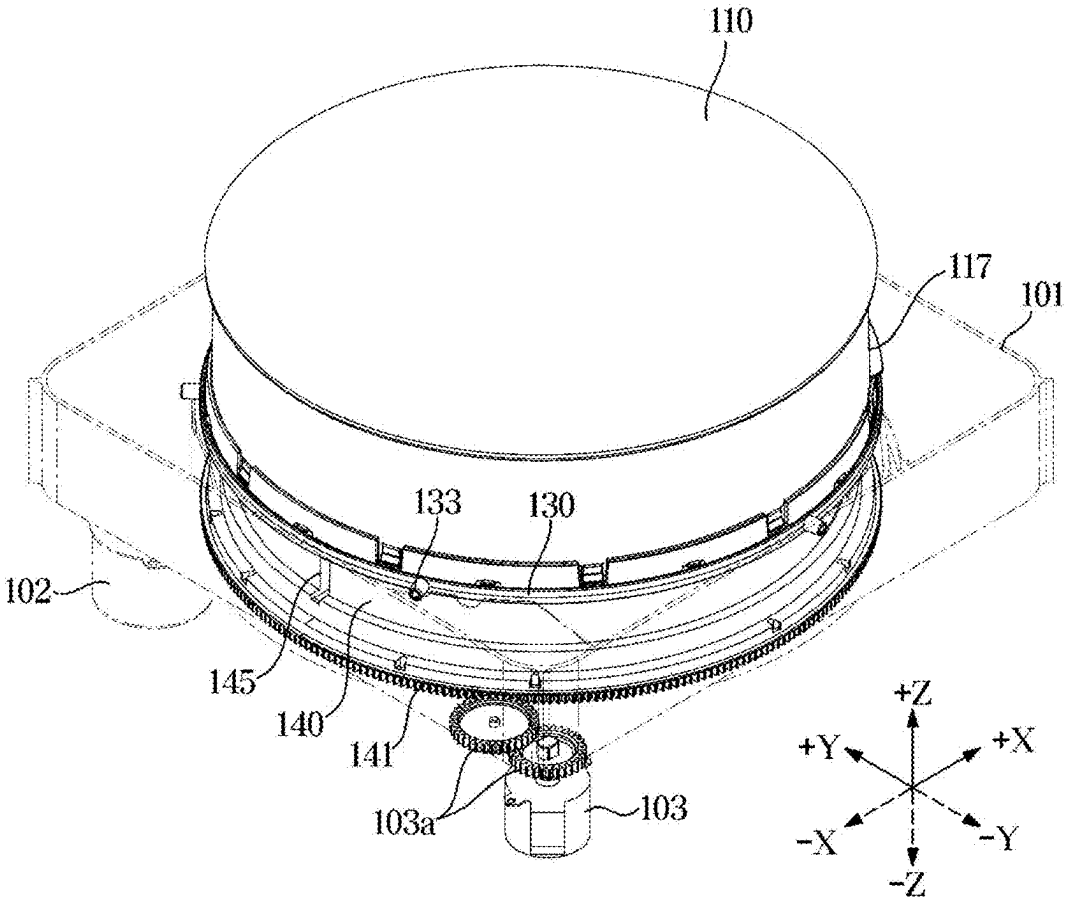


FIG. 14

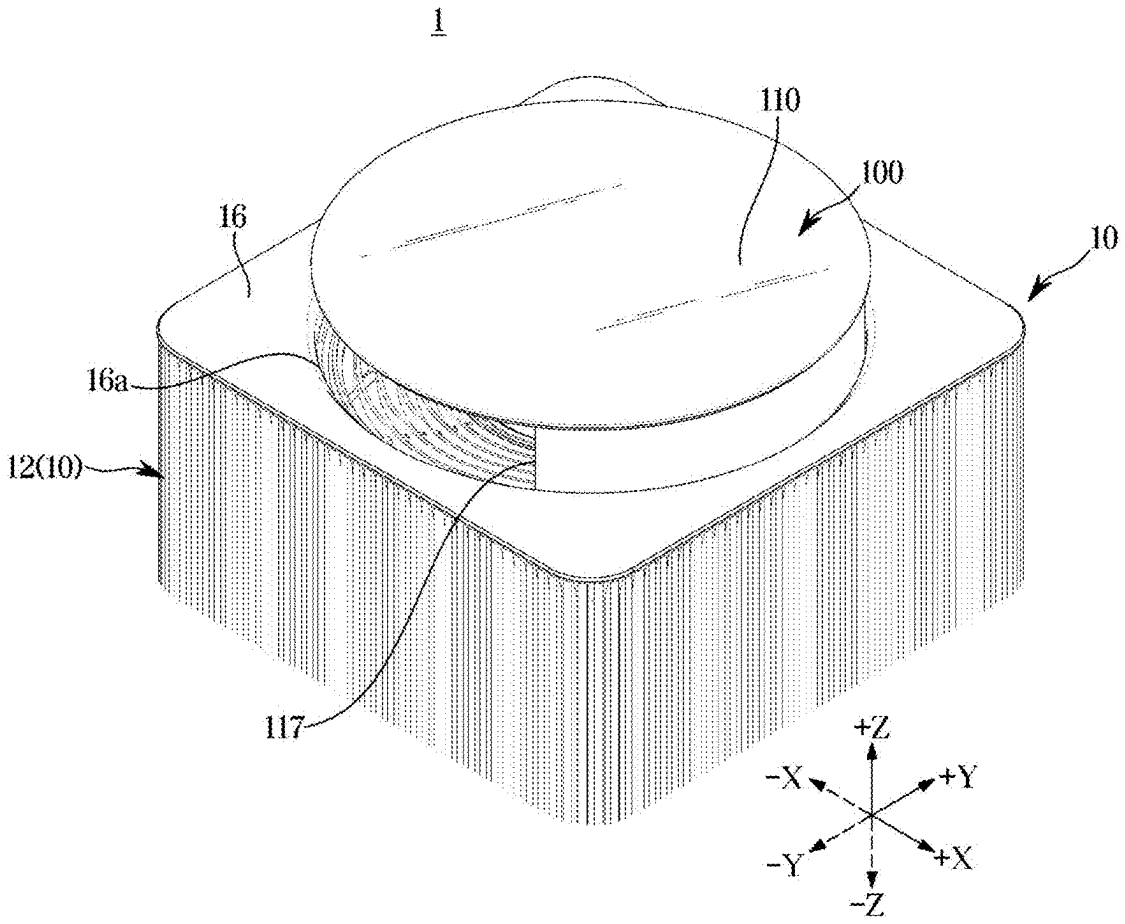
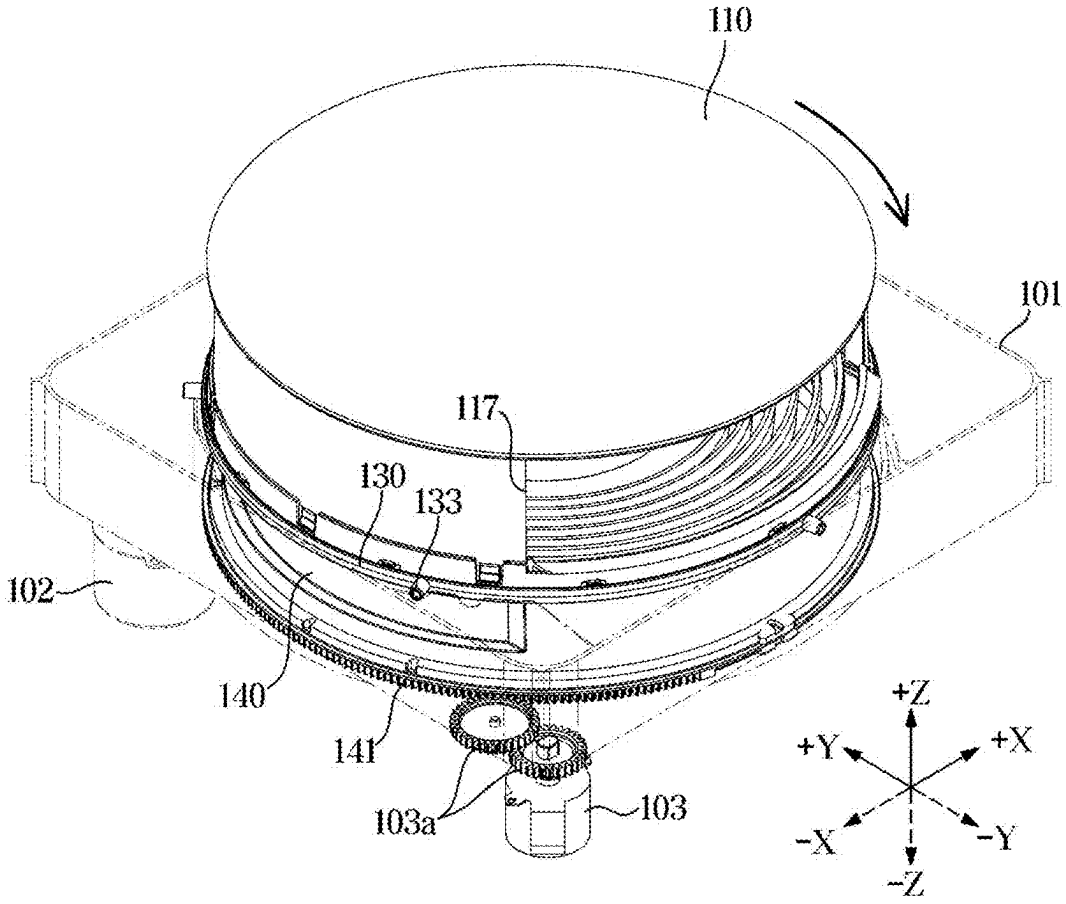


FIG. 15



AIR CONDITIONER

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation of International Application No. PCT/KR2024/020680 designating the United States, filed on Dec. 19, 2024, in the Korean Intellectual Property Receiving Office and claiming priority to Korean Patent Application Nos. 10-2024-00219658, filed on Feb. 15, 2024, and 10-2024-0068871, filed on May 27, 2024, in the Korean Intellectual Property Receiving Office, the disclosures of each of which are incorporated by reference herein in their entireties.

BACKGROUND

Field

[0002] The disclosure relates to an air conditioner, and for example, to an air conditioner including a discharge device.

Description of Related Art

[0003] In general, an air conditioner is an appliance that performs functions such as air purification, ventilation, humidity control, cooling, or heating in an air-conditioned room, and refers to an appliance with at least one of these functions.

[0004] The air conditioner may include an air purifier for removing contaminants from the air. The air purifier may remove bacteria, viruses, mold, particulate matter, and chemicals that cause odors from the incoming air.

[0005] The air purifier may include a purification unit for purifying contaminated indoor air. Air drawn into the air purifier may pass through the purification unit and be purified into clean air by removing contaminants, and the purified air may be discharged to the outside of the air purifier. For example, the purification unit may include a filter and/or a dust collector.

[0006] The air purifier may be used in a variety of rooms. The air purifier may include a discharge unit for regulating at least one of a discharge direction, a discharge rate, and a discharge volume of the purified air.

SUMMARY

[0007] Embodiments of the disclosure provide an air conditioner capable of discharging purified air in a variety of ways.

[0008] Embodiments of the disclosure provide an air conditioner with improved operational reliability.

[0009] According to an example embodiment, an air conditioner includes: a housing including an inlet, an outlet, and a discharge port, a blower configured to circulate air into and/or out of the housing, and a discharge device configured to guide a portion of the air blown toward the outlet by the blower to the discharge port, wherein the discharge device includes a base fixed to the housing and configured to mount a movable drive source and a rotary drive source thereon, a discharge cover configured to open or close the discharge port, the discharge port being movable and rotatable with respect to the base, a movable transmission configured to receive power from the movable drive source to move the discharge cover, and a rotary transmission configured to receive power from the rotary drive source to rotate the discharge cover.

[0010] According to an example embodiment, an air conditioner includes: a housing including an inlet, an outlet, and a discharge port, a blower configured to circulate air into and/or out of the housing, and a discharge device configured to guide a portion of air blown toward the outlet by the blower to the discharge port, wherein the discharge device includes a base fixed to the housing and configured to mount a movable drive source and a rotary drive source thereon, and a discharge cover configured to open or close the discharge port, the discharge cover being movable and rotatable with respect to the base. The discharge device is configured such that during movement of the discharge cover, the rotary drive source is fixed to the base, and during rotating of the discharge cover, the movable drive source is fixed to the base.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The above and other aspects, features and advantages of certain embodiments of the present disclosure will be more apparent from the following detailed description, taken in conjunction with the accompanying drawings, in which:

[0012] FIG. **1** is a perspective view illustrating an air conditioner according to various embodiments;

[0013] FIG. **2** is an exploded perspective view of a portion of a vent panel of the air conditioner according to various embodiments;

[0014] FIG. **3** is a cross-sectional view of the air conditioner according to various embodiments;

[0015] FIG. **4** is an exploded perspective view of a discharge device of the air conditioner disassembled from a housing according to various embodiments;

[0016] FIG. **5** is an exploded perspective view of the discharge device according to various embodiments;

[0017] FIG. **6** is a partial cross-sectional view of the discharge device according to various embodiments;

[0018] FIG. **7** is a perspective view of the discharge device with a discharge port closed according to various embodiments;

[0019] FIG. **8** is a perspective view illustrating a coupling relationship between configurations associated with movement of a discharge cover, when the discharge device has the discharge port closed according to various embodiments;

[0020] FIG. **9** is a lower perspective view of configurations associated with movement of the discharge cover, when the discharge device has the discharge port closed according to various embodiments;

[0021] FIG. **10** is a perspective view of the discharge device with the discharge port open according to various embodiments;

[0022] FIG. **11** is a perspective view illustrating the coupling relationship between the configurations associated with the movement of the discharge cover, when the discharge device has the discharge port open according to various embodiments;

[0023] FIG. **12** is a lower perspective view of the configurations associated with the movement of the discharge cover, when the discharge device has the discharge port open according to various embodiments;

[0024] FIG. **13** is a perspective view illustrating the coupling relationship between the configurations associated with rotation of the discharge cover, when the discharge device has the discharge port open according to various embodiments;

[0025] FIG. **14** is a perspective view of the discharge cover of the discharge device in a rotated state according to various embodiments; and

[0026] FIG. **15** is a perspective view illustrating the coupling relationship between the configurations associated with the rotation of the discharge cover, when the discharge cover of the discharge device has the discharge port open according to various embodiments.

DETAILED DESCRIPTION

[0027] The disclosure and terms used herein are not intended to limit the technical features described herein to the various example embodiments, and should be understood to include various modifications, equivalents, or substitutions of the corresponding embodiments.

[0028] In describing of the drawings, similar reference numerals may be used for similar or related elements.

[0029] The singular form of a noun corresponding to an item may include one or more of the items unless clearly indicated otherwise in a related context.

[0030] In the disclosure, phrases, such as "A or B", "at least one of A and B", "at least one of A or B", "A, B or C", "at least one of A, B and C", and "at least one of A, B, or C" may include any one or all possible combinations of the items listed together in the corresponding phrase among the phrases.

[0031] As used herein, the term "and/or" includes any and all combinations of one or more of the associated listed items.

[0032] Terms such as "1st", "2nd", "primary", or "secondary" may be used simply to distinguish an element from other elements, without limiting the element in other aspects (e.g., importance or order).

[0033] When an element (e.g., a first element) is referred to as being "(functionally or communicatively) coupled" or "connected" to another element (e.g., a second element), the first element may be connected to the second element, directly (e.g., wired), wirelessly, or through a third element.

[0034] It will be understood that when the terms "includes", "comprises", "including", and/or "comprising" are used in the disclosure, they specify the presence of the specified features, figures, steps, operations, components, members, or combinations thereof, but do not preclude the presence or addition of one or more other features, figures, steps, operations, components, members, or combinations thereof.

[0035] When a given element is referred to as being "connected to", "coupled to", "supported by" or "in contact with" another element, it is to be understood that it may be directly or indirectly connected to, coupled to, supported by, or in contact with the other element. When a given element is indirectly connected to, coupled to, supported by, or in contact with another element, it is to be understood that it may be connected to, coupled to, supported by, or in contact with the other element through a third element.

[0036] It will also be understood that when an element is referred to as being "on" another element, it may be directly on the other element or intervening elements may also be present.

[0037] An air conditioner according to various embodiments is a device that performs functions such as purification, ventilation, humidity control, cooling or heating in an air conditioning space (hereinafter referred to as "indoor space"), and in particular a device having at least one of these functions.

[0038] According to an embodiment, an air conditioner may include a heat pump device to perform a cooling function or a heating function. The heat pump device may include a refrigeration cycle in which a refrigerant is circulated through a compressor, a first heat exchanger, and an expansion device and a second heat exchanger. All of the components of the heat pump device may be embedded in a single housing forming an exterior of an air conditioner, which includes a window-type air conditioner or a portable air conditioner. On the other hand, some components of the heat pump device may be divided and embedded in a plurality of housings forming a single air conditioner, which includes a wall-mounted air conditioner, a stand-type air conditioner, and a system air conditioner.

[0039] The air conditioner including the plurality of housings may include at least one outdoor unit installed outdoors and at least one indoor unit installed indoors. For example, the air conditioner may be provided such that a single outdoor unit and a single indoor unit are connected by a refrigerant pipe. The air conditioner may be provided such that a single outdoor unit is connected to two or more indoor units by a refrigerant pipe. The air conditioner may be provided such that two or more outdoor units and two or more indoor units are connected by a plurality of refrigerant pipes.

[0040] The outdoor unit may be electrically connected to the indoor unit. For example, information (or commands) for controlling the air conditioner may be received through an input interface provided in the outdoor unit or the indoor unit. The outdoor unit and the indoor unit may operate simultaneously or sequentially in response to a user input.

[0041] The air conditioner may include an outdoor heat exchanger provided in the outdoor unit, an indoor heat exchanger provided in the indoor unit, and a refrigerant pipe connecting the outdoor heat exchanger and the indoor heat exchanger.

[0042] The outdoor heat exchanger may be configured to exchange heat between a refrigerant and air from outdoor through a phase change of the refrigerant (e.g., evaporation or condensation). For example, while the refrigerant is condensed in the outdoor heat exchanger, the refrigerant may radiate heat to the outdoor air. While the refrigerant flowing in the outdoor heat exchanger evaporates, the refrigerant may absorb heat from the outdoor air.

[0043] The indoor unit is installed indoors. For example, according to the arrangement method of the indoor unit, the air conditioner may be classified into a ceiling-type indoor unit, a stand-type indoor unit, a wall-type indoor unit, and the like. For example, the ceiling-type indoor unit may be classified into a 4-way type indoor unit, a 1-way type indoor unit, a duct type indoor unit and the like according to a method of discharging air.

[0044] Similarly, the indoor heat exchanger may be configured to exchange heat between a refrigerant and outdoor air through a phase change of the refrigerant (e.g., evaporation or condensation). For example, while the refrigerant evaporates in the indoor unit, the refrigerant may absorb heat from the indoor air. The indoor space may be cooled by blowing the indoor air cooled through the cooled indoor heat exchanger. While the refrigerant is condensed in the indoor heat exchanger, the refrigerant may radiate heat to the indoor

air. The indoor space may be heated by blowing the indoor air heated through the high-temperature indoor heat exchanger.

[0045] In other words, the air conditioner may perform a cooling or heating function by a phase change process of a refrigerant circulated between the outdoor heat exchanger and the indoor heat exchanger. To circulate the refrigerant, the air conditioner may include a compressor to compress the refrigerant. The compressor may draw refrigerant gas through an inlet and compress the refrigerant gas. The compressor may discharge high-temperature and high-pressure refrigerant gas through an outlet. The compressor may be disposed inside the outdoor unit.

[0046] Through the refrigerant pipe, the refrigerant may be circulated sequentially through the compressor, the outdoor heat exchanger, the expansion device, and the indoor heat exchanger or sequentially circulated through the compressor, the indoor heat exchanger, the expansion device, and the outdoor heat exchanger.

[0047] For example, in the air conditioner, when a single outdoor unit and a single indoor unit are directly connected through a refrigerant pipe, the refrigerant may be circulated between the single outdoor unit and the single indoor unit through the refrigerant pipe.

[0048] For example, in the air conditioner, when a single outdoor unit is connected to two or more indoor units through a refrigerant pipe, the refrigerant may flow from the single outdoor unit to the plurality of indoor units through branched refrigerant pipes. Refrigerant discharged from the plurality of indoor units may be combined and circulated to the outdoor unit. For example, each of the plurality of indoor units may be directly connected in parallel to the single outdoor unit through a separate refrigerant pipe.

[0049] Each of the plurality of indoor units may be operated independently according to an operation mode set by a user. In other words, some of the plurality of indoor units may be operated in a cooling mode while others of the plurality of indoor units are operated in a heating mode. At that time, the refrigerant may be selectively introduced into each indoor unit in a high-pressure state or a low-pressure state, discharged, and circulated to the outdoor unit along a circulation path that is designated through a flow path switching valve to be described later.

[0050] For example, in the air conditioner, when two or more outdoor units and two or more indoor units are connected by the plurality of refrigerant pipes, refrigerant discharged from the plurality of outdoor units may be combined and flow through one refrigerant pipe, and then diverged again at a certain point and introduced into the plurality of indoor units.

[0051] All of the plurality of outdoor units may be driven or at least some of the plurality of outdoor units may not be driven, in accordance with a driving load corresponding to an operating amount of the plurality of indoor units. At that time, the refrigerant may be provided through a flow path switching valve to be introduced into and circulated to an outdoor unit that is selectively driven. The air conditioner may include the expansion device to reduce the pressure of the refrigerant flowing into the heat exchanger. For example, the expansion device may be disposed inside the indoor unit or inside the outdoor unit, or disposed both inside the indoor unit and the outdoor unit.

[0052] The expansion device may reduce the temperature and pressure of the refrigerant using a throttling effect. The expansion device may include an orifice configured to reduce a cross-sectional area of a flow path. A temperature and pressure of the refrigerant passing through the orifice may be lowered.

[0053] For example, the expansion device may be implemented as an electronic expansion valve configured to adjust an opening ratio (a ratio of a cross-sectional area of a flow path of a valve in a partially opened state to a cross-sectional area of the flow path of the valve in a fully opened state). According to the opening ratio of the electronic expansion valve, the amount of refrigerant passing through the expansion device may be adjusted.

[0054] The air conditioner may further include a flow path switching valve disposed on the refrigerant circulation path. The flow path switching valve may include a 4-way valve. The flow path switching valve may determine a refrigerant circulation path depending on an operation mode of the indoor unit (e.g., cooling operation or heating operation). The flow path switching valve may be connected to the outlet of the compressor.

[0055] The air conditioner may include an accumulator. The accumulator may be connected to the inlet of the compressor. A low-temperature and low-pressure refrigerant, which is evaporated in the indoor heat exchanger or the outdoor heat exchanger, may flow into the accumulator.

[0056] When a refrigerant mixture of refrigerant liquid and refrigerant gas is introduced, the accumulator may separate the refrigerant liquid from the refrigerant gas, and supply the refrigerant gas separated from the refrigerant liquid to the compressor.

[0057] An outdoor fan may be installed near the outdoor heat exchanger. The outdoor fan may blow outdoor air to the outdoor heat exchanger to promote heat exchange between the refrigerant and the outdoor air.

[0058] The outdoor unit of the air conditioner may include at least one sensor. For example, the outdoor unit sensor may be provided as an environmental sensor. The outdoor unit sensor may be disposed at a given position of the inside or the outside of the outdoor unit. For example, the outdoor unit sensor may include a temperature sensor configured to detect an air temperature around the outdoor unit, an air humidity sensor configured to detect air humidity around the outdoor unit, or a refrigerant temperature sensor configured to detect a refrigerant temperature in a refrigerant pipe passing through the outdoor unit, or a refrigerant pressure sensor configured to detect a refrigerant pressure in a refrigerant pipe passing through the outdoor unit.

[0059] The outdoor unit of the air conditioner may include an outdoor unit communication circuitry. The outdoor unit communication circuitry may be configured to receive a control signal from an indoor unit controller of the air conditioner, which will be described later. Based on a control signal received through the outdoor unit communication circuitry, the outdoor unit may control the operation of the compressor, the outdoor heat exchanger, the expansion device, the flow path switching valve, the accumulator, or the outdoor fan. The outdoor unit may transmit a measurement value detected by the outdoor unit sensor to the indoor unit controller through the outdoor unit communication circuitry.

[0060] The indoor unit of the air conditioner may include a housing, a blower configured to circulate air inside or outside the housing, and the indoor heat exchanger configured to exchange heat with air introduced into the housing.

[0061] The housing may include an inlet. Indoor air may flow into the housing through the inlet.

[0062] The indoor unit of the air conditioner may include a filter configured to filter out foreign substance in air that is introduced into the inside of the housing through the inlet.

[0063] The housing may include an outlet. Air flowing inside the housing may be discharged to the outside of the housing through the outlet.

[0064] An airflow guide configured to guide a direction of air discharged through the outlet may be provided in the housing of the indoor unit. For example, the airflow guide may include a blade positioned in the outlet. For example, the airflow guide may include an auxiliary fan for regulating an exhaust airflow, but is not limited thereto. Alternatively, the airflow guide may be omitted.

[0065] The indoor heat exchanger and the blower arranged on a flow path connecting the inlet and the outlet may be disposed inside the housing of the indoor unit.

[0066] The blower may include an indoor fan and a fan motor. For example, the indoor fan may include an axial fan, a mixed-flow fan, a cross-flow fan and a centrifugal fan.

[0067] The indoor heat exchanger may be arranged between the blower and the outlet or between the inlet and the blower. The indoor heat exchanger may absorb heat from air introduced through the inlet or transfer heat to air introduced through the inlet. The indoor heat exchanger may include a heat exchange tube through which refrigerant flows, and heat exchange fins in contact with the heat exchange tube to increase a heat transfer area.

[0068] The indoor unit of the air conditioner may include a drain tray disposed below the indoor heat exchanger to collect condensed water generated in the indoor heat exchanger. The condensed water contained in the drain tray may be drained to the outside through a drain hose. The drain tray may be arranged to support the indoor heat exchanger.

[0069] The indoor unit of the air conditioner may include an input interface. The input interface may include any type of user input means including a button, a switch, a touch screen and/or a touch pad. A user can directly input setting data (e.g., desired indoor temperature, cooling/heating/dehumidifying/air cleaning operation mode setting, outlet selection setting, and/or air volume setting) through the input interface.

[0070] The input interface may be connected to an external input device. For example, the input interface may be electrically connected to a wired remote controller. The wired remote controller may be installed at a specific location (e.g., a part of a wall) in an indoor space. A user may input setting data related to the operation of the air conditioner by manipulating the wired remote controller. An electrical signal corresponding to the setting data obtained by the wired remote controller may be transmitted to the input interface. In addition, the input interface may include an infrared sensor. A user may remotely input the setting data for operating the air conditioner using a wireless remote controller. The setting data received by the wireless remote controller may be transmitted to the input interface as an infrared signal.

[0071] In addition, the input interface may include a microphone. A user's voice command may be obtained through the microphone. The microphone may convert a user's voice command into an electrical signal and transmit the converted electrical signal to the indoor unit controller. The indoor unit controller may control components of the air conditioner to perform a function corresponding to the user's voice command. The setting data obtained through the input interface (e.g., desired indoor temperature, cooling/heating/dehumidifying/air cleaning operation mode setting, outlet selection setting, and/or air volume setting) may be transmitted to the indoor unit controller to be described later. For example, the setting data obtained through the input interface may be transmitted to the outside, that is, to the outdoor unit or a server through an indoor unit communication circuitry to be described later.

[0072] The indoor unit of the air conditioner may include a power module. The power module may be connected to an external power source to supply power to components of the indoor unit.

[0073] The indoor unit of the air conditioner may include an indoor unit sensor. The indoor unit sensor may be an environmental sensor disposed inside or outside the housing. For example, the indoor unit sensor may include one or more temperature sensors and/or humidity sensors disposed in a predetermined space inside or outside the housing of the indoor unit. For example, the indoor unit sensor may include a refrigerant temperature sensor configured to detect a refrigerant temperature of a refrigerant pipe passing through the indoor unit. For example, the indoor unit sensor may include a refrigerant temperature sensor each configured to detect a temperature of an entrance, a middle portion and/or an exit of the refrigerant pipe passing through the indoor heat exchanger.

[0074] For example, each environmental information detected by the indoor unit sensor may be transmitted to the indoor unit controller to be described later or transmitted to the outside through the indoor unit communication circuitry to be described later.

[0075] The indoor unit of the air conditioner may include the indoor unit communication circuitry. The indoor unit communication circuitry may include at least one of a short-range wireless communication module and a long-range wireless communication module. The indoor unit communication circuitry may include at least one antenna for wirelessly communicating with other devices. The outdoor unit may include the outdoor unit communication circuitry. The outdoor unit communication circuitry may also include at least one of a short-range wireless communication module and a long-range wireless communication module.

[0076] The short-range wireless communication module may include a Bluetooth communication module, a Bluetooth Low Energy (BLE) communication module, a near field communication module, a WLAN (Wi-Fi) communication module, and a Zigbee communication module, an infrared data association (IrDA) communication module, a Wi-Fi Direct (WFD) communication module, an ultrawideband (UWB) communication module, an Ant+communication module, a microwave (uWave) communication module, etc., but is not limited thereto.

[0077] The long-range wireless communication module may include a communication module that performs various types of long-range wireless communication, and may include a mobile communication circuitry. The mobile communication circuitry transmits and receives radio signals with at least one of a base station, an external terminal, and a server in a mobile communication network.

[0078] The indoor unit communication circuitry may communicate with an external device such as a server, a mobile device and other home appliances through an access point (AP). The AP may connect a local area network (LAN), to which an air conditioner or a user device is connected, to a wide area network (WAN) to which a server is connected. The air conditioner or the user device may be connected to the server through the WAN. The indoor unit of the air conditioner may include the indoor unit controller configured to control components of the indoor unit including the blower. The outdoor unit of the air conditioner may include an outdoor unit controller configured to control components of the outdoor unit including the compressor. The indoor unit controller may communicate with the outdoor unit controller through the indoor unit communication circuitry and the outdoor unit communication circuitry. The outdoor unit communication circuitry may transmit a control signal generated by the outdoor unit controller to the indoor unit communication circuitry, or transmit a control signal, which is transmitted from the indoor unit communication circuitry, to the outdoor unit controller. In other words, the outdoor unit and the indoor unit may perform bi-directional communication. The outdoor unit and the indoor unit may transmit and receive various signals generated during the operation of the air conditioner.

[0079] The outdoor unit controller may be electrically connected to components of the outdoor unit and may control the operation of each component. For example, the outdoor unit controller may adjust a frequency of the compressor and control the flow path switching valve to change a circulation direction of the refrigerant. The outdoor unit controller may adjust a rotational speed of the outdoor fan. In addition, the outdoor unit controller may generate a control signal to adjust the opening degree of the expansion valve. Under the control of the outdoor unit controller, the refrigerant may be circulated along the refrigerant circulation circuit including the compressor, the flow path switching valve, the outdoor heat exchanger, the expansion valve, and the indoor heat exchanger.

[0080] Various temperature sensors included in the outdoor unit and the indoor unit may transmit electrical signals corresponding to detected temperatures to the outdoor unit controller and/or the indoor unit controller. For example, the humidity sensors included in the outdoor unit and the indoor unit may respectively transmit electrical signals corresponding to the detected humidity to the outdoor unit controller and/or the indoor unit controller.

[0081] The indoor unit controller may obtain a user input from a user device including a mobile device through the indoor unit communication circuitry, or directly obtain a user input through the input interface or the remote controller. The indoor unit controller may control components of the indoor unit including the blower in response to the received user input. The indoor unit controller may transmit information related to the received user input to the outdoor unit controller of the outdoor unit.

[0082] The outdoor unit controller may control components of the outdoor unit including the compressor based on the information related to the user input received from the indoor unit. For example, when a control signal corresponding to a user input for selecting an operation mode such as a cooling operation, a heating operation, a fan operation, a defrosting operation, or a dehumidifying operation is received from the indoor unit, the outdoor unit controller may control components of the outdoor unit to perform an operation of the air conditioner corresponding to the selected operation mode.

[0083] The outdoor unit controller and the indoor unit controller may include a processor and a memory, respectively. The indoor unit controller may include at least one a first processor and at least one a first memory, and the outdoor unit controller may include at least one a second processor and at least one a second memory.

[0084] The memory may record/store various types of information necessary for the operation of the air conditioner. The memory may store instructions, applications, data and/or programs necessary for the operation of the air conditioner. For example, the memory may store various programs for the cooling operation, the heating operation, the dehumidifying operation, and/or the defrosting operation of the air conditioner. The memory may include volatile memory, such as a static random access memory (S-RAM) and a dynamic random access memory (D-RAM) for temporarily storing data. In addition, the memory may include a non-volatile memory, such as a read only memory (ROM), an erasable programmable read only memory (EPROM), and an electrically erasable programmable read only memory (EEPROM) for long-term storage of data.

[0085] The processor may generate a control signal for controlling an operation of the air conditioner based on instructions, applications, data, and/or programs stored in the memory. The processor may be hardware and may include a logic circuit and an arithmetic circuit. The processor may process data according to a program and/or instructions provided from the memory, and may generate a control signal according to a processing result. The memory and the processor may be implemented as one control circuit or as a plurality of circuits.

[0086] The indoor unit of the air conditioner may include an output interface. The output interface may be electrically connected to the indoor unit controller, and output information related to the operation of the air conditioner under the control of the indoor unit controller. For example, the output interface may output information, such as an operation mode selected by a user input, a wind direction, a wind volume, and a temperature. In addition, the output interface may output sensing information obtained from the indoor unit sensor or the outdoor unit sensor, and output warning/error messages.

[0087] The output interface may include a display and a speaker. The speaker may be a sound device and configured to output various sounds. The display may display information, which is input by a user or provided to a user, as various graphic elements. For example, operational information of the air conditioner may be displayed as at least one of an image and text. In addition, the display may include an indicator that provides specific information. The display may include a liquid crystal display (LCD) panel, a light emitting diode (LED) panel, an organic light emitting diode (OLED) panel, a micro-LED panel, and/or a plurality of LEDs.

[0088] Hereinafter, an air conditioner according to various example embodiments will be described in greater detail with reference to the accompanying drawings. For ease of description, an air conditioner will be described herein as an example of an air conditioner, but the present disclosure is not limited to air conditioners and may be applied to a

variety of appliances, including the indoor unit of an air conditioner including a heat exchanger.

[0089] FIG. **1** is a perspective view illustrating an air conditioner according to various embodiments. FIG. **2** illustrates a partial exploded view of a vent panel of the air conditioner according to various embodiments. FIG. **3** is a cross-sectional view of the air conditioner according to various embodiments.

[0090] Referring to FIGS. **1**, **2** and **3** (which may be referred to as FIGS. **1** to **3**), an air conditioner **1** may include a housing **10**. The housing **10** may form an exterior of the air conditioner **1**.

[0091] The housing **10** may include a frame body **11** and a vent panel **12** arranged on an outer side of the frame body **11**. The frame body **11** may support various configurations of the air conditioner **1**. The frame body **11** may be configured to accommodate various configurations of the air conditioner **1**. The frame body **11** may be configured such that at least a portion thereof is covered by the vent panel **12**.

[0092] The vent panel **12** may be detachably mounted to the frame body **11**. For example, the vent panel **12** may include a first vent panel forming a front side of the air conditioner **1**, a second vent panel forming a rear side of the air conditioner **1**, a third vent panel forming a right side of the air conditioner **1**, and a fourth vent panel forming a left side of the air conditioner **1**. The first vent panel may be referred to as a front panel. The second vent panel may be referred to as the rear panel. The third vent panel may be referred to as the right side panel. The fourth vent panel may be referred to as the left side panel.

[0093] The first vent panel, the second vent panel, the third vent panel, and the fourth vent panel may be provided as separate configurations. However, at least some of the first, second, third, and the fourth vent panels may be formed integrally. At least some of the first vent panel, the second vent panel, the third vent panel, and the fourth vent panel may be detachable from the frame body **11**.

[0094] The vent panel **12** may include a panel portion **12***a*. The panel portion **12***a* may include a plurality of ribs. The plurality of ribs may extend in one direction. For example, the plurality of ribs may extend in an up-and-down direction. However, the present disclosure is not limited thereto.

[0095] The panel portion **12***a* may be formed over an entire area of the vent panel **12**. For example, the panel portion **12***a* may be arranged in a uniform pattern over the entire area of the vent panel **12**. This may allow for greater freedom in the design of the vent panel **12** to improve aesthetics.

[0096] The housing **10** may include an air vent **13**. For example, the air vent **13** may be formed in the vent panel **12**. The air vent **13** may extend in the up-and-down direction. The air vents **13** may be formed in a plurality. For example, the plurality of air vents **13** may be arranged in a direction perpendicular to the up-and-down direction (Z direction). For example, the plurality of air vents **13** may be arranged along a left-to-right direction (Y direction) or along a front-to-back direction (X direction).

[0097] The air vents **13** may be formed corresponding to the panel portion **12***a*. For example, the air vents **13** may be openings formed between the plurality of ribs of the panel portion **12***a*. Air from outside the housing **10** may be drawn into the housing **10** through the air vents **13** or discharged from the housing **10**. The air vents **13** may include a plurality of openings.

[0098] The housing **10** may include an inlet **13***a* and an outlet **13***b*. The inlet **13***a* may be configured such that air from the outside of the housing **10** may enter the inside of the housing **10**. The outlet **13***b* may be configured such that air from the inside of the housing **10** may be discharged to the outside of the housing **10**. The inlet **13***a* and the outlet **13***b* may be formed in the vent panel **12**. The air vent **13** may include the inlet **13***a* and the outlet **13***b*. The inlet **13***a* may be provided as one portion of the air vent **13**, and the outlet **13***b* may be provided as another portion of the air vent **13**. One portion of the air vent **13** may be the inlet **13***a*, and another portion of the air vent **13** may be the outlet **13***b*.

[0099] The housing **10** may include an inlet opening **14** and an outlet opening **15**. The inlet opening **14** and the outlet opening **15** may be formed in the frame body **11**. The inlet opening **14** may be arranged to correspond to the inlet **13***a* of the air vent **13**. The outlet opening **15** may be arranged to correspond to the outlet **13***b* of the air vent **13**.

[0100] The air conditioner **1** according to an embodiment of the present disclosure may be configured such that air is introduced into the inside of the housing **10** via the inlet **13***a* and the inlet opening **14**, and purified air is discharged to the outside of the housing **10** via the outlet opening **15** and the outlet **13***b*.

[0101] For example, the inlet **13***a* may include a first inlet and a second inlet spaced apart from the first inlet, and the inlet opening **14** may include a first inlet opening corresponding to the first inlet and a second inlet opening corresponding to the second inlet. The first inlet and the second inlet may be arranged in a vertical direction, and correspondingly, the first inlet opening and the second inlet opening may be arranged in the vertical direction.

[0102] For example, the outlet **13***b* may include a first outlet and a second outlet spaced apart from the first outlet, and the outlet opening **15** may include a first outlet opening corresponding to the first outlet and a second outlet opening corresponding to the second outlet. The first outlet and the second outlet may be arranged in the vertical direction, and correspondingly, the first outlet opening and the second outlet opening may be arranged in the vertical direction.

[0103] The inlet **13***a* and the outlet **13***b* may be formed on the first vent panel, the second vent panel, the third vent panel, and the fourth vent panel, respectively. The first inlet opening **14** and the second outlet opening **15** may be formed on the front, the rear, the right side, and the left side of the frame body **11**, respectively.

[0104] For example, air outside the housing **10** may flow into the housing **10** from all sides via the inlet **13***a* and the inlet opening **14**. For example, air from the outside of the housing **10** may flow into the housing **10** from all directions through the inlet **13***a* and the inlet opening **14**.

[0105] In addition, for example, air inside the housing **10** may flow out of the housing **10** in all sides to the outside of the housing **10** through the outlet **13***b* and the outlet opening **15**. For example, air from the inside of the housing **10** may flow in all directions to the outside of the housing **10** through the outlet **13***b* and the outlet opening **15**.

[0106] By allowing air to flow in and/or out in all directions, air circulation within the housing **10** may be facilitated. The air conditioner **1** may achieve a high dust collection efficiency.

[0107] The housing **10** may include an upper frame **16**. The upper frame **16** may be disposed on an upper portion of

the housing **10**. The upper frame **16** may be arranged on an upper side of the frame body **11**.

[0108] The upper frame **16** may be provided with a user interface. For example, the user interface may include a control portion. The user interface may receive inputs from a user or output operational information of the air conditioner **1** to the user.

[0109] The housing **10** may include a support **19**. The support **19** may be positioned on a lower portion of the housing **10** to support configurations that make up the housing **10** and the air conditioner **1**.

[0110] The air conditioner **1** may include a blower **30**. The blower **30** may generate a blowing force. The blower **30** may move air. The blower **30** may force air to flow. The blower **30** may rotate to create a flow of air inside the housing **10**. The blower **30** may cause air to enter through the inlet **13***a* and the inlet opening **14** and to exit through the outlet **13***b* and the outlet opening **15**. For example, the blower **30** may move air in an upward direction. However, the present disclosure is not limited thereto, and in response to the inlet **13***a* being provided above the outlet **13***b*, the blower **30** may move air in a downward direction.

[0111] The blower **30** may be arranged on the inside of the housing **10**. The blower **30** may be positioned on a downstream side of the inlet **13***a*. The blower **30** may be positioned on an upstream side of the outlet **13***b*. The blower **30** may be disposed between the inlet **13***a* and the outlet **13***b*.

[0112] The air conditioner **1** may include a plurality of blowers **30**. The plurality of blowers **30** may be arranged along a substantially vertical direction (Z direction). The plurality of blowers **30** may be arranged to be spaced apart from each other along the substantially vertical direction (Z direction). For example, the air conditioner **1** may include a first blower and a second blower. However, there is no limit to the number of blowers **30**.

[0113] A flow path **20** may be formed within the housing **10**. The flow path **20** may extend from the inlet **13***a* to the outlet **13***b*. Air blown by the blower **30** may flow into the flow path **20**.

[0114] The air may pass through the housing **10** along an air flow direction. The air flow direction may be a direction from upstream to downstream of the flow path **20** formed within the housing **10**. For example, the air flow direction within the housing **10** may include the vertical direction (Z direction). The air flow direction may be a direction in which air introduced into the housing **10** via the inlet **13***a* and the inlet opening **14** is directed toward the outlet opening **15** and the outlet **13***b*. For example, the air flow direction may be a direction in which air is drawn into the housing **10** via the inlet **13***a* and the inlet opening **14** and then passes through a dust collecting device **50** (e.g., dust collector), a deodorizing device **40** (e.g., deodorizer), and the blower **30**. For example, air drawn into the front, rear, left, and right sides of the housing **10** by the blower **30** may flow upward and then be discharged back into the front, rear, left, and right sides of the housing **10**. However, the air flow direction is not limited to the examples described above.

[0115] The air conditioner **1** may include an air guide **17**. Air flowing into the housing **10** via the inlet **13***a* and the inlet opening **14** may be guided toward the blower **30** through the air guide **17**. The air guide **17** may form a portion of the flow path **20** therein. The air guide **17** may guide air from the inside of the housing **10** and/or the flow path **20** to the blower **30**. Air passing through the inside of the air guide **17** may flow into the inside of the blower case **18** and to the blower **30**.

[0116] The air conditioner **1** may include the blower case **18**. The blower **30** may be arranged within the blower case **18**. The blower case **18** may form a portion of the flow path **20** therein. The blower case **18** may guide the flow of air within the housing **10**. The blower case **18** may be in communication with the air guide **17**.

[0117] The air conditioner **1** may include the dust collector **50**. The dust collector **50** may be configured to filter air. The dust collector **50** may capture aerosols in the air. For example, the dust collector **50** may include a first assembly **51** configured to charge aerosols in the air, and a second assembly **52** configured to collect aerosols charged by the first assembly **51**.

[0118] The dust collector **50** may be arranged within the housing **10**. The dust collector **50** may be positioned such that air entering through the inlet **13***a* and the inlet opening **14** passes therethrough. The dust collector **50** may be positioned such that air may pass therethrough before being discharged through the outlet opening **15** and the outlet **13***b*. The dust collector **50** may be disposed between the inlet **13***a* and the outlet **13***b*. The dust collector **50** may be disposed between the inlet opening **14** and the outlet opening **15**. The dust collector **50** may filter the air introduced into the housing **10** through the inlet **13***a* by the blower **30**. The filtered air may be discharged to the outside of the housing **10** through the outlet **13***b*.

[0119] For example, the dust collector **50** may be arranged on a lower side of the blower **30**. For example, the blower **30** may be arranged on an upper side of the dust collector **50**. For example, the dust collector **50** and the blower **30** may be arranged such that the deodorizer **40** is interposed therebetween. However, the positions of the deodorizer **40**, the dust collector **50**, and the blower **30** are not limited to the examples described above.

[0120] The air conditioner **1** may include a plurality of dust collectors **50**. The plurality of dust collectors **50** may be arranged along the substantially vertical direction (Z direction). The plurality of dust collectors **50** may be arranged to be spaced apart from each other along the substantially vertical direction (Z direction). For example, the air conditioner **1** may include a first dust collector and a second dust collector. However, there is no limit to the number of dust collectors **50**.

[0121] The air conditioner **1** may include the deodorizer **40**. The deodorizer **40** may be configured to deodorize air. The deodorizer **40** may be configured to remove odorous substances from the air. The deodorizer **40** may be configured to sterilize the air. For example, the deodorizer **40** may sterilize the air by decomposing organic matter in the air. Air flowing inside the housing **10** may deodorized while passing through the deodorizer **40**.

[0122] The deodorizer **40** may include a light source device **41** and a photocatalytic filter **42**. The photocatalytic filter **42** may react with light emitted from the light source of the light source device **41** to produce a reactant, which may deodorize the air by decomposing odorous matter.

[0123] The deodorizer **40** may be arranged within the housing **10**. The deodorizer **40** may be positioned such that air entering through the inlet **13***a* and the inlet opening **14** passes therethrough. The deodorizer **40** may be positioned such that air may pass therethrough before being discharged

through the outlet opening **15** and the outlet **13***b*. The deodorizer **40** may be disposed between the inlet **13***a* and the outlet **13***b*. The deodorizer **40** may be disposed between the inlet opening **14** and the outlet opening **15**.

[0124] The deodorizer **40** may be configured to deodorize air passing through the dust collector **50**. The deodorizer **40** may be positioned on a downstream side of the dust collector **50** in the air flow direction. The deodorizer **40** may be disposed between the dust collector **50** and the outlet **13***b*. The deodorizer **40** may be disposed between the dust collector **50** and the outlet opening **15**. However, the present disclosure is not limited thereto, and the deodorizer **40** may be positioned on an upstream side of the dust collector **50** in the air flow direction. In this case, the dust collector **50** may be configured to capture aerosols in the air passing through the deodorizer **40**.

[0125] For example, the deodorizer **40** may be arranged on an upper side of the dust collector **50**. For example, the dust collector **50** may be arranged on a lower side of the deodorizer **40**. For example, the deodorizer **40** may be arranged between the dust collector **50** and the blower **30**. However, the positions of the deodorizer **40**, the dust collector **50**, and the blower **30** are not limited to the examples described above.

[0126] The air conditioner **1** may include a plurality of deodorizers **40**. The plurality of deodorizers **40** may be arranged along the substantially vertical direction (Z direction). The plurality of deodorizers **40** may be arranged to be spaced apart from each other along the substantially vertical direction (Z direction). For example, the air conditioner **1** may include a first deodorizer and a second deodorizer. However, there is no limit to the number of deodorizers **40**.

[0127] For example, the first deodorizer may be arranged on upper side of the first dust collector. For example, the second deodorizer may be arranged on an upper side of the second dust collector. For example, the first blower may be arranged between the first dust collector and the second dust collector. For example, the second dust collector may be spaced upwardly from the first dust collector with the first blower therebetween. For example, the first blower may be arranged between the first deodorizer and the second dust collector. For example, the second blower may be arranged on the upper side of the second dust collector. For example, the second blower may be arranged on the upper side of the second dust collector to move air passing through the second dust collector toward the outlet **13***b*. For example, the second blower may be arranged on the upper side of the second deodorizer. For example, the second blower may be arranged on the upper side of the second deodorizer to move air passing through the second deodorizer toward the outlet **13***b*. However, the present disclosure is not limited to the examples described above, and the positions of the dust collector **50**, the deodorizer **40**, and the blower **30** are not limited to the examples described above.

[0128] For example, the air conditioner **1** may omit the blower **30**, the deodorizer **40**, and the dust collector **50** arranged below, and the configurations associated therewith.

[0129] The dust collector **50** may be positioned on the flow path **20**. The deodorizer **40** may be positioned on the flow path **20**. The blower **30** may be positioned on the flow path **20**. For example, air introduced into the flow path **20** via the inlet **13***a* may flow to the outlet **13***b* after passing through the dust collector **50**, the deodorizer **40**, and the blower fan **30**. The air flowing to the outlet **13***b* may exit from the flow path **20**.

[0130] FIG. **4** is an exploded perspective view a discharge device of the air conditioner disassembled from the housing according to various embodiments. FIG. **5** is an exploded perspective view of the discharge device according to various embodiments. FIG. **6** is a partial cross-sectional view of the discharge device according to various embodiments.

[0131] Referring to FIGS. **4**, **5** and **6** (which may be referred to as FIGS. **4** to **6**), the air conditioner **1** according to an embodiment of the present disclosure may include a discharge device **100**. The discharge device **100** may be mounted on the housing **10**. The discharge device **100** may be mounted on the frame body **11** of the housing **10**. The discharge device **100** may be mounted on an upper portion **11***a* of the frame body **11**. The discharge device **100** may be positioned between the upper portion **11***a* of the frame body **11** and the upper frame **16**.

[0132] The air conditioner **1** according to an embodiment of the present disclosure may include a discharge port **16***a* formed on the upper frame **16**. The discharge port **16***a* may be arranged to face in a direction different from the direction in which the outlet **13***b* faces. For example, the discharge port **16***a* may be arranged to face upward. The discharge port **16***a* may be arranged at an end of a flow path branched from a flow path formed between the blower **30** and the outlet **13***b*. Air blown from the blower **30** may be discharged to the outside of the housing **10** via the outlet **13***b* or the discharge port **16***a*.

[0133] The discharge device **100** may be configured to open or close the discharge port **16***a*. The discharge device **100** may be configured to guide a portion of air blown to the outlet **13***b* by the blower **30** to the discharge port **16***a*.

[0134] The discharge device **100** may include a base **101**. The base **101** may be secured to the housing **10**. The base **101** may be mounted and secured to the frame body **11**. The base **101** may support various configurations of the discharge device **100**. For example, the base **101** may include a drive source case **104** for mounting a movable drive source **102** and a rotary drive source **103**.

[0135] The discharge device **100** may include the movable drive source **102** mounted to the base **101**. The movable drive source **102** may be configured to provide power to move a discharge cover **110**. For example, the movable drive source **102** may be arranged at a right rear corner portion of the base **101**. The movable drive source **102** may include a motor.

[0136] In an example, the discharge device **100** may include a moving gear **102***a* for transmitting power from the movable drive source **102** to a rotating member **120**. The movable drive source **102** may include the moving gear **102***a*. The movable drive source **102** may be connected to the rotating member **120** through the moving gear **102***a*. For example, the moving gear **102***a* may include a plurality of gears.

[0137] The discharge device **100** may include the rotary drive source **103** mounted to the base **101**. The rotary drive source **103** may be configured to provide power to rotate the discharge cover **110**. For example, the rotary drive source **103** may be arranged at a left rear corner portion of the base **101**. The rotary drive source **103** may include a motor.

[0138] In an example, the discharge device **100** may include a rotary gear **103***a* for transmitting power from the

rotary drive source **103** to a rotary transmission part **140**. The rotary drive source **103** may include the rotary gear **103***a*. The rotary drive source **103** may be connected to the rotary transmission part **140** via the rotary gear **103***a*. For example, the rotary gear **103***a* may include a plurality of gears.

[0139] The discharge device **100** according to an embodiment of the present disclosure may be configured such that the rotary drive source **103** is fixed to the base **101** during the time the discharge cover **110** is moving. The discharge device **100** according to an embodiment of the present disclosure may be configured such that the movable drive source **102** is fixed to the base **101** during the time the discharge cover **110** is rotating. The discharge device **100** of the air conditioner **1** according to an embodiment of the present disclosure may be configured such that both the movable drive source **102** and the rotary drive source **103** are fixed to the base **101**, so that the movable drive source **102** and the rotary drive source **103** do not move during the discharge cover **110** is moving or rotating, thereby improving the stability of operation. In addition, the discharge device **100** of the air conditioner **1** according to an embodiment of the present disclosure may be configured such that both the movable drive source **102** and the rotary drive source **103** are fixed to the base **101**, so that the movable drive source **102** and the rotary drive source **103** do not move during the time the discharge cover **110** is moving or rotating, thereby preventing/inhibiting wires connected to the movable drive source **102** and/or the rotary drive source **103** from moving, twisting, or breaking, causing a failure. The discharge device **100** of the air conditioner **1** according to an embodiment of the present disclosure may be configured such that both the movable drive source **102** and the rotary drive source **103** are fixed to the base **101**, so that the movable drive source **102** and the rotary drive source **103** do not move during the time the discharge cover **110** is moving or rotating, thereby preventing and/or reducing a decrease in the safety factor due to the weight of the drive sources **102** and **103**.

[0140] The discharge device **100** may include the discharge cover **110**. The discharge cover **110** may be configured to open or close the discharge port **16***a*. The discharge cover **110** may be configured to be movable and rotatable with respect to the base **101**. For example, the discharge cover **110** may have a cylindrical shape with an open bottom.

[0141] The discharge cover **110** may include a cover opening **117** formed on a portion of an outer circumferential surface of the discharge cover **110**. The cover opening **117** may be located on the inside of the housing **10** in response to the discharge cover **110** closing the discharge port **16***a*. At least a portion of the cover opening **117** may be located on the outside of the housing **10** in response to the discharge cover **110** opening the discharge port **16***a*. For example, the cover opening **117** may be configured such that air discharged in the substantially vertical direction from the housing **10** through the discharge port **16***a* may be directed in a substantially horizontal direction.

[0142] The discharge cover **110** may be coupled to the transition member **130**. The discharge cover **110** may be rotatably coupled to the transition member **130**. The discharge cover **110** may be coupled to the transition member **130** to be movable together with the transition member **130** in the up-and-down direction. The discharge cover **110** may be coupled to the transition member **130** such that the discharge cover **110** is rotatable relative to the transition member **130** and movable together with the transition member **130** in the up-and-down direction.

[0143] For example, the discharge cover **110** may include a rotation support **111** provided along the circumference of the discharge cover **110**. The rotation support **111** may be coupled to a rotation coupler **131** of the transition member **130**. For example, the rotation support **111** of the discharge cover **110** may have a groove shape, and the rotation coupler **131** of the transition member **130** may have a shape that protrudes inwardly from an inner circumferential surface of the transition member **130**.

[0144] The discharge cover **110** may be coupled to the rotary transmission part **140** to be rotatable together with the rotary transmission part **140**. The discharge cover **110** may be coupled to the rotary transmission part **140** so as to be movable with respect to the rotary transmission part **140**. For example, the discharge cover **110** may be coupled to the rotary transmission part **140** such that rotation with respect to the rotary transmission part **140** is restricted, and movement with respect to the rotary transmission part **140** in the up-and-down direction is possible.

[0145] For example, the discharge cover **110** may include a cover coupler **115** (e.g., see FIG. **9**) that is movably coupled to a part coupler **145** of the rotary transmission part **140**. The part coupler **145** of the rotary transmission part **140** may extend along a direction of movement of the discharge cover **110**. For example, the cover coupler **115** may have a shape that protrudes inwardly from the inner circumferential surface of the discharge cover **110**, and the part coupler **145** may have a groove shape into which the cover coupler **115** may be slidably insertable. The discharge cover **110** may be configured to limit rotation of the rotary transmission part **140** as the part coupler **145** and the cover coupler **115** are coupled together.

[0146] The air conditioner **1** according to an embodiment of the present disclosure may allow, during the time the discharge cover **110** is opening the discharge port **16***a*, a portion of the air blown by the blower **30** to be discharged to the outside of the housing **10** through the outlet **13***b* and another portion of the air blown by the blower **30** to be discharged to the outside of the housing **10** through the discharge port **16***a*.

[0147] The discharge device **100** may include a movable transmission part **120**, **130**, and **106** for receiving power from the movable drive source **102** to move the discharge cover **110**. For example, the movable transmission part **120**, **130**, and **106** may include the rotating member **120**, the transition member **130**, and the moving support member **106**.

[0148] The discharge device **100** may include the rotating member **120**. The rotating member **120** may be arranged to be rotatable with respect to the base **101**. The rotating member **120** may be rotatably received in the base **101**. The rotating member **120** may be rotatably seated on the base **101**. The rotating member **120** may be connected to the movable drive source **102**. The rotating member **120** may be connected to the moving gear **102***a* of the movable drive source **102**.

[0149] The rotating member **120** may include a moving gear connection **121** for connection to the movable drive source **102**. The moving gear connection **121** may be provided at least partially along an outer circumferential

surface of the rotating member **120**. The moving gear connection **121** may have a gear shape. For example, since the moving gear **102***a* of the movable drive source **102** and the moving gear connection **121** of the rotating member **120** are connected, the rotating member **120** may rotate by receiving a rotational force from the movable drive source **102**.

[0150] The rotating member **120** may include a moving guide **123** for guiding the movement of the transition member **130**. The moving guide **123** may extend in the direction of the movement of the discharge cover **110**. For example, the moving guide **123** may extend in the up-and-down direction. The moving guide **123** may be arranged to be coupled with a moving coupler **133** of the transition member **130**. For example, the moving coupler **133** of the transition member **130** may have a protruding shape, and the moving guide **123** may have a slit shape into which the moving coupler **133** is slidably inserted. For example, the number of moving guides **123** may be provided as a single or plural number corresponding to the number of moving couplers **133**.

[0151] The discharge device **100** may include the transition member **130**. The transition member **130** may be coupled to the rotating member **120** to be rotatable together with the rotating member **120**. The transition member **130** may be coupled to the rotating member **120** to be movable relative to the rotating member **120**. For example, the transition member **130** may have a ring shape.

[0152] For example, the transition member **130** may include the moving coupler **133** that is movably coupled to the moving guide **123** of the rotating member **120**. For example, the moving coupler **133** may have a shape that protrudes outwardly from an outer circumferential surface of the transition member **130**, and the moving guide **123** may have a slit shape into which the moving coupler **133** is slidably inserted. For example, the number of moving couplers **133** may be provided in a single or plural number corresponding to the number of moving guides **123**. Since the moving coupler **133** moves in the up-and-down direction along the moving guide **123**, the transition member **130** may move in up-and-down direction relative to the rotating member **120**.

[0153] The transition member **130** may include the rotation coupler **131** rotatably coupled to the rotation support **111** of the discharge cover **110**. The transition member **130** may be configured such that movement with respect to the discharge cover **110** is restricted because the rotation support **111** and the rotation coupler **131** are coupled. For example, the rotation coupler **131** may have a shape that protrudes inwardly from the inner circumferential surface of the transition member **130**, and the rotation support **111** of the discharge cover **110** may have a groove shape formed on the outer circumferential surface of the discharge cover **110**.

[0154] The transition member **130** may be coupled to the discharge cover **110** so as to be movable together with the discharge cover **110**. The transition member **130** may be coupled to the discharge cover **110** to be rotatably coupled with respect to the discharge cover **110**.

[0155] The discharge device **100** may include the moving support member **106**. The moving support member **106** may guide the movement of the transition member **130** during rotation of the rotating member **120**. The moving support member **106** may guide the movement of the transition member **130** in the up-and-down direction. For example, the moving support member **106** may be formed integrally with the base **101**.

[0156] The moving support member **106** may have an inclined shape to move the moving coupler **133** of the transition member **130** in the up-and-down direction during rotation of the transition member **130**. The moving support member **106** may extend along the outer circumference of the transition member **130**. For example, the moving support member **106** may be arranged such that upwardly inclined portions and downwardly inclined portions are repeated along the outer circumference of the transition member **130**. The moving support member **106** may support the moving coupler **133** of the transition member **130**. The moving coupler **133** of the transition member **130** may be slidably movable along the moving support member **106**.

[0157] The discharge device **100** may include a moving cover **150** for forming a moving rail **107** (e.g., see FIG. **8**) for the moving coupler **133** of the transition member **130** together with the moving support portion **106**. The moving cover **150** may be seated on the base **101**. The moving cover **150** may be supported by at least a portion of the moving support portion **106** of the base **101**. The moving cover **150** may include a cover incline portion **151** corresponding to an incline portion of the moving support portion **106**. The moving coupler **133** of the transition member **130** may move along the moving rail **107** formed by the moving support portion **106** and the moving cover **150**. For example, the moving rail **107** may be formed in three or more sections along the circumference of the transition member **130**.

[0158] The discharge device **100** may include the rotary transmission part **140**. The rotary transmission part **140** may be configured to receive power from the rotary drive source **103** to rotate the discharge cover **110**.

[0159] The rotary transmission part **140** may include a rotary gear connection **141** for coupling with the rotary drive source **103**. The rotary gear connection **141** may be provided at least partially along the outer circumferential surface of the rotary transmission part **140**. The rotary gear connection **141** may have a gear shape. For example, since the rotary gear **103***a* of the rotary drive source **103** and the rotary gear connection **141** of the rotary transmission part **140** are connected, the rotary transmission part **140** may rotate by receiving a rotational power from the rotary drive source **103**.

[0160] The rotary transmission part **140** may include the part coupler **145** extending along the direction of the movement of the discharge cover **110**. The part coupler **145** of the rotary transmission part **140** may be coupled with the cover coupler **115** of the discharge cover **110**. For example, the part coupler **145** may extend along the direction of the movement of the discharge cover **110**. For example, the part coupler **145** may have a groove shape, and the cover coupler **115** of the discharge cover **110** may have a protruding shape that is slidably inserted into the part coupler **145**.

[0161] With such a configuration, the discharge device **100** may be configured so that the rotary transmission part **140** may rotate as the rotary drive source **103** operates, and the discharge cover **110** may rotate without moving as the rotary transmission part **140** rotates. Since the part coupler **145** and the cover coupler **115** are coupled, the discharge cover **110** may be configured such that rotation thereof is

restricted with respect to the rotary transmission part **140**, and movement is available with respect to the rotary transmission part **140**.

[0162] The discharge device **100** may include a fan device **160**. The fan device **160** may include a discharge fan **161** operable to discharge a portion of the air blown by the blower **30** through the discharge port **16***a* during the time the discharge cover **110** opens the discharge port **16***a*. The fan device **160** may include a fan case **162** in which the discharge fan **161** is mounted. For example, during operation of the fan device **160**, the air conditioner **1** may discharge a greater amount of air through the discharge port **16***a* than the amount of air discharged through the outlet **13***b* from the air blown by the blower **30**. For example, during operation of the fan device **160**, the air conditioner **1** may discharge the air discharged from the discharge port **16***a* further away from the air conditioner **1**. For example, during operation of the fan device **160**, the air conditioner **1** may discharge the air discharged from the discharge port **16***a* more quickly.

[0163] Referring to FIG. **6**, the discharge device **100** of the air conditioner **1** according to an embodiment of the present disclosure may have, centered on an axis of rotation of the discharge fan **161**, the discharge cover **110** and the transition member **130** arranged on the outer side of the rotary transmission part **140**, the moving support member **106** and the moving cover **150** arranged on the outer side of the discharge cover **110** and the transition member **130**, and the rotating member **120** arranged on the outer side of the moving support member **106** and the moving cover **150**.

[0164] FIG. **7** is a perspective view illustrating a state in which the discharge device closes the discharge port according to various embodiments. FIG. **8** is a perspective view illustrating a coupling relationship between configurations associated with the movement of the discharge cover in a state in which the discharge device closes the discharge port according to various embodiments. FIG. **9** a perspective view illustrating a lower portion of configurations associated with the movement of the discharge cover in a state in which the discharge device closes the discharge port according to various embodiments.

[0165] Referring to FIGS. **7**, **8** and **9** (which may be referred to as FIGS. **7** to **9**), a state in which the discharge device **100** according to an embodiment of the present disclosure closes the discharge port **16***a* will be described.

[0166] Referring to FIGS. **7** to **9**, based on the discharge device **100** closing the discharge port **16***a*, the moving coupler **133** of the transition member **130** may be positioned at a lower portion of the moving guide **123** of the rotating member **120**. The moving coupler **133** of the transition member **130** may be positioned at a lower portion of the moving support member **106**. The cover coupler **115** of the discharge cover **110** may be positioned at a lower portion of the part coupler **145** of the rotary transmission part **140**.

[0167] FIG. **10** is a perspective view illustrating a state in which the discharge device opens the discharge port according to various embodiments. FIG. **11** is a perspective view a coupling relationship between the configurations associated with the movement of the discharge cover when the discharge device opens the discharge port according to various embodiments. FIG. **12** is a perspective view illustrating a lower portion of the configurations associated with the movement of the discharge cover when the discharge device opens the discharge port according to various embodiments.

[0168] Referring to FIGS. **10**, **11** and **12** (which may be referred to as FIGS. **10** to **12**), a state in which the discharge device **100** according to an embodiment of the present disclosure opens the discharge port **16***a* will be described.

[0169] Referring to FIGS. **10** to **12**, based on the discharge device **100** opening the discharge port **16***a*, the moving coupler **133** of the transition member **130** may be positioned on an upper portion of the moving guide **123** of the rotating member **120**. The moving coupler **133** of the transition member **130** may be positioned on an upper portion of the moving support member **106**. The cover coupler **115** of the discharge cover **110** may be positioned on an upper portion of the part coupler **145** of the rotary transmission part **140**.

[0170] For example, the discharge device **100** according to an embodiment of the present disclosure may be configured to cause the rotating member **120** to rotate as the movable drive source **102** operates, the transition member **130** to move upward with rotation as the rotating member **120** rotates, and the discharge cover **110** to move upward without rotation as the transition member **130** moves upward with rotation, thereby opening the discharge port **16***a*.

[0171] As the rotating member **120** rotates, the moving coupler **133** inserted into the moving guide **123** of the rotating member **120** may be moved in the direction of rotating the transition member **130**. During the time the moving coupler **133** is moving in the direction of rotating the transition member **130**, the moving coupler **133** may be moved on the moving support member **106**, and since the moving support member **106** has an upwardly inclined shape, the moving coupler **133** may move upwardly. As the moving coupler **133** moves upwardly, the discharge cover **110**, which is coupled to move upwardly and downwardly together with the transition member **130**, may move upwardly. During the upward movement of the discharge cover **110**, the coupling of the part coupler **145** of the rotary transmission part **140** and the cover coupler **115** of the discharge cover **110** may cause the discharge cover **110** to move upward without rotation.

[0172] In order for the discharge device **100** according to an embodiment of the present disclosure to operate to close the discharge port **16***a* in an open state, the process described above may be performed in reverse. For example, as the movable drive source **102** generates a rotational force in a direction opposite to that of raising the discharge cover **110**, the rotating member **120** is rotated, and as the rotating member **120** rotates, the transition member **130** is moved downwardly with rotation, and as the transition member **130** is moved downwardly with rotation, the discharge cover **110** is moved downward without rotation, thereby closing the discharge port **16***a*.

[0173] FIG. **13** is a perspective view illustrating the coupling relationship between the configurations associated with the rotation of the discharge cover in a state in which the discharge device opens the discharge port according to various embodiments. FIG. **14** is a perspective view illustrating a state in which the discharge cover of the discharge device is rotated according to various embodiments. FIG. **15** is a perspective view illustrating the coupling relationship between the configurations associated with the rotation of

the discharge cover in a state in which the discharge cover of the discharge device is rotated according to various embodiments.

[0174] Referring to FIG. **10** and FIG. **13**, FIG. **14** and FIG. **15**, an operation of rotating the discharge cover **110** of the discharge device **100** according to an embodiment of the present disclosure will be described.

[0175] The discharge cover **110** of the discharge device **100** according to an embodiment of the present disclosure may be rotated from the state shown in FIG. **10** and FIG. **13** to the state shown in FIG. **14** and FIG. **15**.

[0176] For example, as the rotary drive source **103** operates, the rotary transmission part **140** is rotated, and as the rotary transmission part **140** rotates, the coupling of the part coupler **145** and the cover coupler **115** may cause the discharge cover **110** to rotate without movement. Since the transition member **130** is configured to be rotatable with respect to the discharge cover **110**, the transition member **130** may not rotate even when the discharge cover **110** rotates.

[0177] In order for the discharge cover **110** of the discharge device **100** according to an embodiment of the present disclosure to rotate from the state shown in FIGS. **14** and **15** to the state shown in FIGS. **10** and **13**, the process described above may be performed in reverse. More particularly, the rotary drive source **103** may generate a rotational force in the direction opposite to the direction described above, and accordingly, the rotary transmission part **140** and the discharge cover **110** may rotate in the opposite direction.

[0178] With such a configuration, the air conditioner **1** according to an embodiment of the present disclosure may guide a portion of the air blown toward the outlet **13***b* to the discharge port **16***a*, thereby discharging the air in a variety of ways.

[0179] The air conditioner **1** according to an embodiment includes the housing **10** including the inlet **13***a*, the outlet **13***b*, and the discharge port **16***a*, the blower **30** configured to circulate air into or out of the housing, and the discharge device **100** configured to guide a portion of the air blown toward the outlet by the blower to the discharge port. The discharge device may include the base **101** fixed to the housing and configured to mount the movable drive source **102** and the rotary drive source **103** thereon, the discharge cover **110** configured to open or close the discharge port, the discharge port being movable and rotatable with respect to the base, the movable transmission **120**, **130**, and **106** configured to receive power from the movable drive source to move the discharge cover, and the rotary transmission **140** configured to receive power from the rotary drive source to rotate the discharge cover.

[0180] The movable transmission part may include the rotating member **120** comprising a gear connected to the movable drive source and rotatable with respect to the base, the transition member **130** comprising a ring coupled to the rotating member to be rotatable together with the rotating member and movable with respect to the rotating member, and a moving support **106** configured to guide the movement of the transition member while the rotating member rotates.

[0181] The transition member may be coupled to the discharge cover to be movable together with the discharge cover and rotatable with respect to the discharge cover.

[0182] The discharge cover may include the rotation support **111** provided along the circumference of the discharge cover. The transition member may include the rotation coupler **131** rotatably coupled to the rotation support. The transition member may be configured to restrict movement with respect to the discharge cover as the rotation support and the rotation coupler are coupled.

[0183] The discharge device may be configured such that in response to operation of the movable drive source the rotating member rotates, in response to the rotation of the transition member the transition member rotates, and in response to the transition member rotates moving with rotation, the discharge cover moves without rotation to opens or close the discharge port.

[0184] The rotating member may include the moving guide **123** configured to guide the movement of the transition member. The transition member may include the moving coupler **133** movably coupled to the moving guide.

[0185] The discharge device may include the moving cover **150** including the moving rail **107** configured to move the moving coupler together with the moving support member.

[0186] The moving support may be formed integrally with the base.

[0187] The discharge cover may be coupled to the rotary transmission to be rotatable together with the rotary transmission and movable with respect to the rotary transmission.

[0188] The rotary transmission may include the part coupler **145** extending along a direction of movement of the discharge cover. The discharge cover may include the cover coupler **115** movably coupled to the rotary coupler. The discharge cover may be configured to restrict rotation with respect to the rotary transmission as the part coupler and the cover coupler are coupled.

[0189] The discharge device may be configured such that in response to operation of the rotary drive source the rotary transmission rotates, in response to the rotation of the rotary transmission the discharge cover rotates without linear movement.

[0190] The discharge cover may include the cover opening **117** formed on a portion of an outer circumferential surface of the discharge cover. The cover opening may be located inside the housing based on the discharge cover closing the discharge port, and at least a portion of the cover opening may be located outside the housing based on the discharge cover opening the discharge port.

[0191] Based on the discharge cover opening the discharge port, a portion of the air blown by the blower may be discharged through the outlet, and another portion of the air blown by the blower may be discharged through the discharge port.

[0192] The discharge device may include the discharge fan **161** operable to discharge another portion of the air blown by the blower through the discharge port while the discharge cover opens the discharge port.

[0193] The discharge device may be configured such that based on the discharge cover moving, the rotary drive source is fixed to the base, and based on the discharge cover rotating, the movement driving source is fixed to the base.

[0194] The air conditioner **1** according to an embodiment may include the housing **10** including the inlet **13***a*, the outlet **13***b*, and the discharge port **16***a*, the blower **30** configured to circulate air into or out of the housing, and the discharge device **100** configured to guide a portion of air blown toward the outlet by the blower to the discharge port. The discharge device may include the base **101** fixed to the

housing and configured to mount the movable drive source **102** and the rotary drive source **103** thereon, and the discharge cover **110** configured to open or close the discharge port, the discharge cover being movable and rotatable with respect to the base. The discharge device may be configured such that while the discharge cover is moving, the rotary drive source is fixed to the base, and while the discharge cover is rotating, the movable drive source is fixed to the base.

[0195] The discharge device may include the rotating member **120** connected to the movable drive source and rotatable with respect to the base, the transition member **130** coupled to the rotating member to be rotatable together with the rotating member and movable with respect to the rotating member, and the moving support member **106** configured to guide movement of the transition member while the rotating member rotates.

[0196] The discharge device may be configured such that in response to operation of the movable drive source, the rotating member rotates, in response to the rotation of the rotating member, the transition member moves with rotation, and in response to the transition member moving with rotation, the discharge cover moves without rotation to open or close the discharge port.

[0197] The discharge device may include the rotary transmission part **140** configured to receive power from the rotary drive source to rotate the discharge cover.

[0198] The discharge device may be configured such that in response to operation of the rotary drive source, the rotary transmission part rotates, and in response to the rotation of the rotary transmission part, the discharge cover rotates without movement.

[0199] According to the present disclosure, the air conditioner includes the discharge device, so that purified air may be discharged in a variety of ways.

[0200] According to the present disclosure, since both the movable drive source and the rotary drive source of the discharge device are mounted and fixed on the base of the air conditioner, thereby improving operational reliability.

[0201] While the present disclosure has been illustrated and described with reference to various example embodiments, it should be understood by those skilled in the art that various changes in form and detail may be made without departing from the spirit and scope of the present disclosure, including the appended claims and their equivalents. It will also be understood that any of the embodiment(s) described herein may be used in conjunction with any other embodiment(s) described herein.

What is claimed is:

1. An air conditioner comprising:

a housing including an inlet, an outlet, and a discharge port;

a blower configured to circulate air into or out of the housing; and

a discharge device configured to guide a portion of the air blown toward the outlet by the blower to the discharge port;

wherein the discharge device comprises:

a base fixed to the housing and configured to mount a movable drive source and a rotary drive source thereon,

a discharge cover configured to open or close the discharge port, the discharge cover being movable and rotatable with respective to the base,

a movable transmission configured to receive power from the movable drive source to move the discharge cover, and

a rotary transmission configured to receive power from the rotary drive source to rotate the discharge cover.

2. The air conditioner of claim **1**, wherein the movable transmission part comprises:

a rotating member comprising a gear connected to the movable drive source and rotatable with respect to the base,

a transition member comprising a ring coupled to the rotating member so as to be rotatable together with the rotating member and movable with respect to the rotating member; and

a moving support configured to guide movement of the transition member while the rotating member rotates.

3. The air conditioner of claim **2**, wherein the transition member is coupled to the discharge cover to be movable together with the discharge cover and rotatable with respect to the discharge cover.

4. The air conditioner of claim **3**, wherein

the discharge cover comprises a rotation support provided along the circumference of the discharge cover,

the transition member comprises a rotation coupler rotatably coupled to the rotation support, and

the transition member is configured to restrict movement with respect to the discharge cover as the rotation support and the rotation coupler are coupled.

5. The air conditioner of claim **4**, wherein the discharge device is configured such that:

in response to operation of the movable drive source, the rotating member rotates,

in response to the rotation of the rotating member, the transition member moves with rotation, and

in response to the transition member moving with rotation, the discharge cover moves without rotation to open or close the discharge port.

6. The air conditioner of claim **2**, wherein

the rotating member comprises a moving guide configured to guide the movement of the transition member, and

the transition member comprises a moving coupler movably coupled to the moving guide.

7. The air conditioner of claim **6**, wherein the discharge device comprises a moving cover including a moving rail configured to move the moving coupler together with the moving support member.

8. The air conditioner of claim **2**, wherein the moving support is formed integrally with the base.

9. The air conditioner of claim **1**, wherein the discharge cover is coupled to the rotary transmission to be rotatable together with the rotary transmission and movable with respect to the rotary transmission.

10. The air conditioner of claim **9**, wherein

the rotary transmission comprises a part coupler extending along a direction of movement of the discharge cover,

the discharge cover comprises a cover coupler movably coupled to the part coupler, and

the discharge cover is configured to restrict rotation with respect to the rotary transmission as the part coupler and the cover coupler are coupled.

11. The air conditioner of claim **10**, wherein the discharge device is configured such that:

in response to operation of the rotary drive source, the rotary transmission rotates, and

in response to the rotation of the rotary transmission, the discharge cover rotates without linear movement.

12. The air conditioner of claim **1**, wherein

the discharge cover comprises a cover opening formed on a portion of an outer circumferential surface of the discharge cover, and

the cover opening is located inside the housing based on the discharge cover closing the discharge port, and

at least a portion of the cover opening is located outside the housing based on the discharge cover opening the discharge port.

13. The air conditioner of claim **1**, wherein based on the discharge cover opening the discharge port, a portion of the air blown by the blower is configured to be discharged through the outlet, and another portion of the air blown by the blower is configured to be discharged through the discharge port.

14. The air conditioner of claim **13**, wherein the discharge device comprises a discharge fan operable to discharge another portion of the air blown by the blower through the discharge port while the discharge cover opens the discharge port.

15. The air conditioner of claim **1**, wherein the discharge device is configured such that:

based on the discharge cover moving, the rotary drive source is fixed to the base, and

based on the discharge cover rotating, the movable drive source is fixed to the base.

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