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AIR CONDITIONER AND METHOD FOR CONTROLLING THE SAME

Abstract

An air conditioner is provided. The air conditioner includes a housing, a discharge cover configured to cover a discharge hole formed on an upper part of the housing, and including a cover opening through which air is discharged, a rotation transmission part coupled to the discharge cover and configured to rotate the discharge cover, a cover rotation motor configured to rotate the rotation transmission part in a first direction or a second direction opposite to the first direction, a fan case equipped with a discharge fan configured to move air toward the discharge hole and the cover opening, a magnet provided at a position of the rotation transmission part, a first sensor disposed at a first position of the fan case and configured to detect the magnet, a second sensor disposed at a second position of the fan case and configured to detect the magnet, the second position being spaced apart from the first position, memory storing one or more computer programs, and one or more processors communicatively coupled to the cover rotation motor, the first sensor, the second sensor, and the memory, wherein the one or more computer programs include computer-executable instructions that, when executed by the one or more processors individually or collectively, cause the air conditioner to move the rotation transmission part, via the cover rotation motor, to a reference position based on a power off condition of the air conditioner being satisfied, and determine whether to stop an operation of the cover rotation motor based on whether the magnet is detected by the first sensor or the second sensor.

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Background/Summary

CROSS-REFERENCE TO RELATED APPLICATION(S) [0001] This application is a continuation application, claiming priority under § 365(c), of an International application No. PCT/KR2025/000802, filed on Jan. 14, 2025, which is based on and claims the benefit of a Korean patent application number 10-2024-0021957, filed on Feb. 15, 2024, in the Korean Intellectual Property Office, and of a Korean patent application number 10-2024-0074608, filed on Jun. 7, 2024, in the Korean Intellectual Property Office, the disclosure of each of which is incorporated by reference herein in its entirety.

TECHNICAL FIELD
[0002] The disclosure relates to an air conditioner that adjusts a direction of air discharge, and a method for controlling the same.
BACKGROUND ART
[0003] An air conditioner may refer to an apparatus that performs at least one of the functions such as air purification, ventilation, humidity control, cooling or heating in an air conditioning space.
[0004] For example, an air conditioner may include an air purifier to remove contaminants from the air. The air purifier may remove germs, viruses, mold, fine dust, and chemicals in the drawn-in air, which cause unpleasant odors.
[0005] The air purifier may include a purification device for purifying contaminated indoor air. Air drawn into the air purifier may be purified into clean air with the contaminants removed therefrom while passing through the purification device, and the purified air may be discharged from the air purifier. For example, the purification device may include a filter and/or a dust collector.
[0006] The air purifier may be used in various indoor spaces. The air purifier may include a discharge device for controlling at least one of a discharge direction, a discharge speed, and a discharge amount of purified air.
[0007] The above information is presented as background information only to assist with an understanding of the disclosure. No determination has been made, and no assertion is made, as to whether any of the above might be applicable as prior art with regard to the disclosure.
DISCLOSURE
Technical Problem
[0008] Aspects of the disclosure are to address at least the above-mentioned problems and/or disadvantages and to provide at least the advantages described below. Accordingly, an aspect of the disclosure is to provide an air conditioner and a method for controlling the same that easily move a

discharge cover and a rotation transmission part that rotates the discharge cover to a reference position.
[0009] Another aspect of the disclosure is to provide an air conditioner and a method for controlling the same that feedback control a cover rotation motor that rotates a rotation transmission part using a magnet and a plurality of magnetic sensors.
[0010] Additional aspects will be set forth in part in the description which follows and, in part, will be apparent from the description, or may be learned by practice of the presented embodiments.
[0011] In accordance with an aspect of the disclosure, an air conditioner is provided. The air conditioner includes a housing, a discharge cover configured to cover a discharge hole formed on an upper part of the housing, and including a cover opening through which air is discharged, a rotation transmission part coupled to the discharge cover and configured to rotate the discharge cover, a cover rotation motor configured to rotate the rotation transmission part in a first direction or a second direction opposite to the first direction, a fan case equipped with a discharge fan configured to move air toward the discharge hole and the cover opening, a magnet provided at a position of the rotation transmission part, a first sensor disposed at a first position of the fan case and configured to detect the magnet, a second sensor disposed at a second position of the fan case and configured to detect the magnet, the second position being spaced apart from the first position, memory storing one or more computer programs, and one or more processors communicatively coupled to the cover rotation motor, the first sensor, the second sensor, and the memory, wherein the one or more computer programs include computer-executable instructions that, when executed by the one or more processors individually or collectively, cause the air conditioner to move the rotation transmission part, via the cover rotation motor, to a reference position based on a power off condition of the air conditioner being satisfied, and determine whether to stop an operation of the cover rotation motor based on whether the magnet is detected by the first sensor or the second sensor.
[0012] In accordance with another aspect of the disclosure, a method for operating an air conditioner including a discharge hole formed on an upper part of a housing, a discharge cover configured to cover the discharge hole and including a cover opening through which air is discharged, a fan case equipped with a discharge fan configured to move air toward the discharge hole and the cover opening, and a processor is provided. The method includes identifying, by the processor, whether a power off condition of the air conditioner is satisfied, controlling a cover rotation motor to rotate a rotation transmission part coupled to the discharge cover so as to move the rotation transmission part to a reference position based on the power off condition of the air conditioner being satisfied, identifying whether a magnet provided at a position of the rotation transmission part is detected by a first sensor disposed at a first position of the fan case or a second sensor disposed at a second position of the fan case, the second position being spaced apart from the first position, and determining whether to stop an operation of the cover rotation motor based on whether the magnet is detected by the first sensor or the second sensor.
[0013] In accordance with another aspect of the disclosure, one or more non-transitory computer-readable storage media storing one or more computer programs including computer-executable instructions that, when executed by one or more processors of an air conditioner individually or collectively, cause the air conditioner to perform operations are provided. The operations include identifying, by the processor, whether a power off condition of the air conditioner is satisfied, rotating, via a cover rotation motor, a rotation transmission part coupled to a discharge cover so as to move the rotation transmission part to a reference position based on the power off condition of the air conditioner being satisfied, identifying whether a magnet provided at a position of the rotation transmission part is detected by a first sensor disposed at a first position of a fan case or a second sensor disposed at a second position of the fan case, the second position being spaced apart from the first position, and determining whether to stop an operation of the cover rotation motor based on whether the magnet is detected by the first sensor or the second sensor.

[0014] According to the disclosure, an air conditioner and a method for controlling the same easily move a discharge cover and a rotation transmission part that rotates the discharge cover to a reference position.
[0015] According to the disclosure, an air conditioner and a method for controlling the same feedback control a cover rotation motor that rotates a rotation transmission part to accurately move the rotation transmission part to a reference position.
[0016] Other aspects, advantages, and salient features of the disclosure will become apparent to those skilled in the art from the following detailed description, which, taken in conjunction with the annexed drawings, discloses various embodiments of the disclosure.

Description

BRIEF DESCRIPTION OF THE DRAWINGS
[0017] The above and other aspects, features, and advantages of certain embodiments of the disclosure will be more apparent from the following description taken in conjunction with the accompanying drawings, in which:
[0018] FIG. **1** illustrates an air conditioner according to an embodiment of the disclosure;
[0019] FIG. **2** is an exploded view illustrating a portion of blower panels of an air conditioner according to an embodiment of the disclosure;
[0020] FIG. **3** is a cross-sectional view of an air conditioner according to an embodiment of the disclosure;
[0021] FIG. **4** is an exploded view illustrating a discharge device separated from a housing of an air conditioner according to an embodiment of the disclosure;
[0022] FIG. **5** is an exploded view illustrating a discharge device according to an embodiment of the disclosure;
[0023] FIG. **6** is a cross-sectional view of a portion of a discharge device according to an embodiment of the disclosure;
[0024] FIG. **7** illustrates a state in which a discharge device closes a discharge hole according to an embodiment of the disclosure;
[0025] FIG. **8** illustrates a coupling relationship between components related to movement of a discharge cover in a state where a discharge device closes a discharge hole according to an embodiment of the disclosure;
[0026] FIG. **9** illustrates lower parts of components related to movement of a discharge cover in a state where a discharge device closes a discharge hole according to an embodiment of the disclosure;
[0027] FIG. **10** illustrates a state in which a discharge device opens a discharge hole according to an embodiment of the disclosure;
[0028] FIG. **11** illustrates a coupling relationship between components related to movement of a discharge cover in a state where a discharge device opens a discharge hole according to an embodiment of the disclosure;
[0029] FIG. **12** illustrates lower parts of components related to movement of a discharge cover in a state where a discharge device opens a discharge hole according to an embodiment of the disclosure;
[0030] FIG. **13** illustrates a coupling relationship between components related to a rotation of a discharge cover in a state where a discharge device opens a discharge hole according to an embodiment of the disclosure;
[0031] FIG. **14** illustrates a state where a discharge cover of a discharge device is rotated according to an embodiment of the disclosure;
[0032] FIG. **15** illustrates a coupling relationship between components related to a rotation of a

discharge cover in a state where the discharge cover of a discharge device is rotated according to an embodiment of the disclosure;
[0033] FIG. **16** is a top view of a partial configuration of a discharge device according to an embodiment of the disclosure;
[0034] FIG. **17** illustrates a magnet provided in a rotation transmission part of the discharge device shown in FIG. **16** according to an embodiment of the disclosure;
[0035] FIG. **18** illustrates sensors provided in a fan case of the discharge device shown in FIG. **16** according to an embodiment of the disclosure;
[0036] FIG. **19** is a control block diagram of an air conditioner according to an embodiment of the disclosure;
[0037] FIG. **20** is a flowchart briefly illustrating a method for controlling an air conditioner according to an embodiment of the disclosure; and
[0038] FIG. **21** is a flowchart illustrating a method for controlling an air conditioner according to an embodiment of the disclosure.
[0039] Throughout the drawings, it should be noted that like reference numbers are used to depict the same or similar elements, features, and structures.
DETAILED DESCRIPTION
[0040] The following description with reference to the accompanying drawings is provided to assist in a comprehensive understanding of various embodiments of the disclosure as defined by the claims and their equivalents. It includes various specific details to assist in that understanding but these are to be regarded as merely exemplary. Accordingly, those of ordinary skill in the art will recognize that various changes and modifications of the various embodiments described herein can be made without departing from the scope and spirit of the disclosure. In addition, descriptions of well-known functions and constructions may be omitted for clarity and conciseness.
[0041] The terms and words used in the following description and claims are not limited to the bibliographical meanings, but, are merely used by the inventor to enable a clear and consistent understanding of the disclosure. Accordingly, it should be apparent to those skilled in the art that the following description of various embodiments of the disclosure is provided for illustration purpose only and not for the purpose of limiting the disclosure as defined by the appended claims and their equivalents.
[0042] It is to be understood that the singular forms “a,” “an,” and “the” include plural referents unless the context clearly dictates otherwise. Thus, for example, reference to “a component surface” includes reference to one or more of such surfaces.
[0043] 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.
[0044] As used herein, the term “and/or” includes any and all combinations of one or more of the associated listed items.
[0045] 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).
[0046] 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.
[0047] 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.
[0048] 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.
[0049] 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.
[0050] 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.
[0051] 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.
[0052] 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. Alternatively, the air conditioner may be provided such that a single outdoor unit is connected to two or more indoor units by a refrigerant pipe. Alternatively, 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.
[0053] 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.
[0054] 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.
[0055] 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.
[0056] 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.
[0057] 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.

[0058] 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.

[0059] 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.

[0060] 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.

[0061] 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.

[0062] 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.

[0063] 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.

[0064] 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 to 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.

[0065] The expansion device may reduce the temperature and pressure of the refrigerant by 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.

[0066] 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.

[0067] 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.
[0068] 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.
[0069] 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.
[0070] 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.
[0071] 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.
[0072] 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.
[0073] 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.
[0074] The housing may include an inlet. Indoor air may flow into the housing through the inlet.
[0075] 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.
[0076] The housing may include an outlet. Air flowing inside the housing may be discharged to the outside of the housing through the outlet.
[0077] 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.
[0078] 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.
[0079] 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.
[0080] 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.

[0081] 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.
[0082] 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 may 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.
[0083] 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 by 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.
[0084] 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.
[0085] 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.
[0086] 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.
[0087] 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.
[0088] 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.
[0089] 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 wireless local area network (WLAN) (wireless fidelity (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.

[0090] 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.

[0091] 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.

[0092] 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.

[0093] 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.

[0094] 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.

[0095] 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.

[0096] The outdoor unit controller and the indoor unit controller may include a processor and 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.

[0097] 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.

[0098] 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.

[0099] 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.

[0100] 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.

[0101] It should be appreciated that the blocks in each flowchart and combinations of the flowcharts may be performed by one or more computer programs which include instructions. The entirety of the one or more computer programs may be stored in a single memory device or the one or more computer programs may be divided with different portions stored in different multiple memory devices.

[0102] Any of the functions or operations described herein can be processed by one processor or a combination of processors. The one processor or the combination of processors is circuitry performing processing and includes circuitry like an application processor (AP, e.g. a central processing unit (CPU)), a communication processor (CP, e.g., a modem), a graphics processing unit (GPU), a neural processing unit (NPU) (e.g., an artificial intelligence (AI) chip), a Wi-Fi chip, a Bluetooth® chip, a global positioning system (GPS) chip, a near field communication (NFC) chip, connectivity chips, a sensor controller, a touch controller, a finger-print sensor controller, a display driver integrated circuit (IC), an audio CODEC chip, a universal serial bus (USB) controller, a camera controller, an image processing IC, a microprocessor unit (MPU), a system on chip (SoC),

an IC, or the like.
[0103] Hereinafter, an air conditioner according to various embodiments of the disclosure will be described in detail with reference to the accompanying drawings. For convenience of description, an air purifier is described as an example of an air conditioner, but the disclosure is not limited to the air purifier, and is applicable to a variety of home appliances including an indoor unit having a heat exchanger.
[0104] FIG. **1** illustrates an air conditioner according to an embodiment of the disclosure.
[0105] FIG. **2** is an exploded view illustrating a portion of blower panels of an air conditioner according to an embodiment of the disclosure.
[0106] FIG. **3** is a cross-sectional view of an air conditioner according to an embodiment of the disclosure.
[0107] Referring to FIGS. **1**, **2**, and **3**, the air conditioner **1** may include a housing **10**. The housing **10** may form an exterior of the air conditioner **1**.
[0108] The housing **10** may include a frame body **11** and a blower panel **12** provided on the outside of the frame body **11**. The frame body **11** may support various components of the air conditioner **1**. The frame body **11** may accommodate various components of the air conditioner **1**. At least a portion of the frame body **11** may be covered by the blower panel **12**.
[0109] The blower panel **12** may be detachably mounted to the frame body **11**. For example, the blower panel **12** may include a first blower panel forming the front of the air conditioner **1**, a second blower panel forming the rear of the air conditioner **1**, a third blower panel forming the right side of the air conditioner, and a fourth blower panel forming the left side of the air conditioner **1**. The first blower panel may be referred to as a front panel. The second blower panel may be referred to as a rear panel. The third blower panel may be referred to as a right panel. The fourth blower panel may be referred to as a left panel.
[0110] The first blower panel, the second blower panel, the third blower panel, and the fourth blower panel may be provided as separate components. However, at least a portion of the first blower panel, the second blower panel, the third blower panel, and the fourth blower panel may be formed integrally. At least a portion of the first blower panel, the second blower panel, the third blower panel, and the fourth blower panel may be detachable from the frame body **11**.
[0111] The blower 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 a vertical direction. However, the disclosure is not limited thereto.
[0112] The panel portion **12***a* may be formed over the entire area of the blower panel **12**. For example, the panel portion **12***a* may be provided in a uniform pattern over the entire area of the blower panel **12**. Accordingly, the degree of freedom in the design of the blower panel **12** may be increased, thereby improving aesthetics.
[0113] The housing **10** may include a blower opening **13**. For example, the blower opening **13** may be formed on the blower panel **12**. The blower opening **13** may extend in a vertical direction. The blower opening **13** may be formed in multiple numbers. For example, a plurality of blower openings **13** may be arranged in a direction perpendicular to the vertical direction (Z direction). For example, the plurality of blower openings **13** may be arranged along the left-right direction (Y direction) or along the front-back direction (X direction).
[0114] The blower opening **13** may be formed corresponding to the panel portion **12***a*. For example, the blower openings **13** may be openings formed between the plurality of ribs of the panel portion **12***a*. Air outside the housing **10** may be introduced into the housing **10** or discharged from the housing **10** through the blower openings **13**. The blower opening **13** may include a plurality of openings.
[0115] The housing **10** may include an inlet portion **13***a* and an outlet portion **13***b*. The inlet portion **13***a* may be provided to allow air from the outside of the housing **10** to be introduced into the housing **10**. The outlet portion **13***b* may be provided to allow air from the inside of the housing **10**

to be discharged to the outside of the housing **10**. The inlet portion **13***a* and the outlet portion **13***b* may be formed in the blower panel **12**. The blower opening **13** may include the inlet portion **13***a* and the outlet portion **13***b*. The inlet portion **13***a* may be provided as one part of the blower opening **13**, and the outlet portion **13***b* may be provided as another part of the blower opening **13**. One part of the blower opening **13** may be the inlet portion **13***a*, and another part of the blower opening **13** may be the outlet portion **13***b*.

[0116] 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 provided to correspond to the inlet portion **13***a* of the blower opening **13**. The outlet opening **15** may be provided to correspond to the outlet portion **13***b* of the blower opening **13**.

[0117] In the air conditioner **1** according to the disclosure, air may be introduced into the housing **10** through the inlet portion **13***a* and the inlet opening **14**, and purified air may be discharged to the outside of the housing **10** through the outlet opening **15** and the outlet portion **13***b*.

[0118] For example, the inlet portion **13***a* may include a first inlet portion and a second inlet portion spaced apart from the first inlet portion, and the inlet opening **14** may include a first inlet opening corresponding to the first inlet portion and a second inlet opening corresponding to the second inlet portion. The first inlet portion and the second inlet portion may be arranged in a vertical direction, and correspondingly, the first inlet opening and the second inlet opening may be arranged in a vertical direction.

[0119] For example, the outlet portion **13***b* may include a first outlet portion and a second outlet portion spaced apart from the first outlet portion, and the outlet opening **15** may include a first outlet opening corresponding to the first outlet portion and a second outlet opening corresponding to the second outlet portion. The first outlet portion and the second outlet portion may be arranged in a vertical direction, and correspondingly, the first outlet opening and the second outlet opening may be arranged in a vertical direction.

[0120] The inlet portion **13***a* and the outlet portion **13***b* may be formed in each of the first blower panel, the second blower panel, the third blower panel, and the fourth blower panel. Correspondingly, the first inlet opening **14** and the second outlet opening **15** may be formed in each of the front, the rear, the right side, and the left side of the frame body **11**.

[0121] For example, air outside the housing **10** may flow into the housing **10** from four directions of the housing **10** through the inlet portion **13***a* and the inlet opening **14**. For example, air outside the housing **10** may flow into the housing **10** from all directions through the inlet portion **13***a* and the inlet opening **14**.

[0122] In addition, for example, air inside the housing **10** may flow from the housing **10** toward the outside of the housing **10** (in four directions of the housing **10**) through the outlet portion **13***b* and the outlet opening **15**. For example, air inside the housing **10** may flow toward the outside of the housing **10** (to all directions) through the outlet portion **13***b* and the outlet opening **15**.

[0123] Because air is introduced and/or discharged from/to all directions, air circulation inside the housing **10** may be smoothly performed. The air conditioner **1** may achieve a high dust collecting efficiency.

[0124] The housing **10** may include an upper frame **16**. The upper frame **16** may be provided at an upper end of the housing **10**. The upper frame **16** may be disposed on top of the frame body **11**.

[0125] A user interface may be provided on the upper frame **16**. For example, the user interface may include an operation portion. The user interface may receive input from a user or output operation information of the air conditioner **1** to the user.

[0126] The housing **10** may include supports **19**. The supports **19** may be disposed at a lower end of the housing **10** to support components of the air conditioner **1** and the housing **10**.

[0127] The air conditioner **1** may include a blower **30**. The blower **30** may generate blowing force. The blower **30** may move air. The blower **30** may force air to flow. The blower **30** may rotate to create an air flow flowing inside the housing **10**. The blower **30** may cause air to be drawn in through the inlet portion **13***a* and the inlet opening **14** and to be discharged through the outlet portion **13***b* and the outlet opening **15**. For example, the blower **30** may move air upward. However, the disclosure is not limited thereto, and in a case where the inlet portion **13***a* is disposed above the outlet portion **13***b*, the blower **30** may move air downward.

[0128] The blower **30** may be disposed inside the housing **10**. The blower **30** may be located downstream of the inlet portion **13***a*. The blower **30** may be located upstream of the outlet portion **13***b*. The blower **30** may be positioned between the inlet portion **13***a* and the outlet portion **13***b*.

[0129] The air conditioner **1** may include a plurality of blowers **30**. The plurality of blowers **30** may be arranged along an approximately vertical direction (Z direction). The plurality of blowers **30** may be spaced apart from each other along an approximately vertical direction (Z direction). For example, the air conditioner **1** may include a first blower and a second blower. However, the number of blowers **30** is not limited.

[0130] A flow path **20** may be formed in the housing **10**. The flow path **20** may extend from the inlet portion **13***a* to the outlet portion **13***b*. Air blown by the blower **30** may flow along the flow path **20**.

[0131] Air may pass through the housing **10** along an airflow direction. The airflow direction may be a direction from upstream to downstream of the flow path **20** formed inside the housing **10**. For example, the airflow direction in the housing **10** may include the vertical direction (Z direction). The airflow direction may be a direction in which air introduced into the housing **10** through the inlet portion **13***a* and the inlet opening **14** flows toward the outlet opening **15** and the outlet portion **13***b*. For example, the airflow direction may be a direction in which air introduced into the housing **10** through the inlet portion **13***a* and the inlet opening **14** passes through a dust collector **50**, a deodorizing device **40**, and the blower **30**. For example, air introduced into the front, rear, left, and right sides of the housing **10** by the blower **30** may flow upward and then be discharged again to the front, rear, left, and right sides of the housing **10**. However, the direction of air flow is not limited to the above-described example.

[0132] The air conditioner **1** may include an air guide **17**. Air flowing into the housing **10** through the inlet portion **13***a* and the inlet opening **14** may be guided toward the blower **30** through the air guide **17**. A portion of the flow path **20** may be formed in the air guide **17**. The air guide **17** may guide air in the housing **10** and/or air in the flow path **20** to the blower **30**. Air that has passed through the inside of the air guide **17** may flow into a blower case **18** and the blower **30**.

[0133] The air conditioner **1** may include the blower case **18**. The blower **30** may be disposed in the blower case **18**. A portion of the flow path **20** may be formed in the blower case **18**. The blower case **18** may guide the flow of air flowing inside the housing **10**. The blower case **18** may be in communication with the air guide **17**.

[0134] The air conditioner **1** may include the dust collector **50**. The dust collector **50** may filter air. The dust collector **50** may collect aerosols in the air. For example, the dust collector **50** may include a first assembly **51** to charge aerosols in the air, and a second assembly **52** to collect the aerosols charged by the first assembly **51**.

[0135] The dust collector **50** may be disposed in the housing **10**. The dust collector **50** may be positioned to allow air introduced through the inlet portion **13***a* and the inlet opening **14** to pass therethrough. The dust collector **50** may be positioned to allow air to pass therethrough before being discharged through the outlet opening **15** and the outlet portion **13***b*. The dust collector **50** may be positioned between the inlet portion **13***a* and the outlet portion **13***b*. The dust collector **50** may be positioned between the inlet opening **14** and the outlet opening **15**. The dust collector **50** may filter air introduced into the housing **10** through the inlet portion **13***a* by the blower **30**. The filtered air may be discharged to the outside of the housing **10** through the outlet portion **13***b*.

[0136] For example, the dust collector **50** may be disposed below the blower **30**. For example, the blower **30** may be positioned above the dust collector **50**. For example, the dust collector **50** and the blower **30** may be arranged to allow the deodorizing device **40** to be disposed therebetween.

However, the positions of the deodorizing device **40**, the dust collector **50**, and the blower **30** are not limited to the above-described example.
[0137] The air conditioner **1** may include a plurality of dust collectors **50**. The plurality of dust collectors **50** may be arranged along an approximately vertical direction (Z direction). The plurality of dust collectors **50** may be spaced apart from each other along an approximately vertical direction (Z direction). For example, the air conditioner **1** may include a first dust collector and a second dust collector. However, the number of dust collectors **50** is not limited.
[0138] The air conditioner **1** may include the deodorizing device **40**. The deodorizing device **40** may deodorize air. The deodorizing device **40** may remove odors from the air. The deodorizing device **40** may sterilize air. For example, the deodorizing device **40** may sterilize air by decomposing organic substances in the air. Odor of air flowing into the housing **10** may be removed while passing through the deodorizing device **40**.
[0139] The deodorizing device **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 generate a reactant, and the reactant may decompose odor substances to deodorize the air.
[0140] The deodorizing device **40** may be disposed in the housing **10**. The deodorizing device **40** may be positioned to allow air introduced through the inlet portion **13***a* and the inlet opening **14** to pass therethrough. The deodorizing device **40** may be positioned to allow air to pass therethrough before being discharged through the outlet opening **15** and the outlet portion **13***b*. The deodorizing device **40** may be positioned between the inlet portion **13***a* and the outlet portion **13***b*. The deodorizing device **40** may be positioned between the inlet opening **14** and the outlet opening **15**.
[0141] The deodorizing device **40** may deodorize air that has passed through the dust collector **50**. The deodorizing device **40** may be located downstream of the dust collector **50** in the airflow direction. The deodorizing device **40** may be positioned between the dust collector **50** and the outlet portion **13***b*. The deodorizing device **40** may be positioned between the dust collector **50** and the outlet opening **15**. However, the disclosure is not limited thereto, and the deodorizing device **40** may also be located upstream of the dust collector **50** in the airflow direction. In this instance, the dust collector **50** may collect aerosols in the air that has passed through the deodorizing device **40**.
[0142] For example, the deodorizing device **40** may be disposed above the dust collector **50**. For example, the dust collector **50** may be disposed below the deodorizing device **40**. For example, the deodorizing device **40** may be positioned between the dust collector **50** and the blower **30**. However, the positions of the deodorizing device **40**, the dust collector **50**, and the blower **30** are not limited to the examples described above.
[0143] The air conditioner **1** may include a plurality of deodorizing devices **40**. The plurality of deodorizing devices **40** may be arranged along an approximately vertical direction (Z direction). The plurality of deodorizing devices **40** may be spaced apart from each other along an approximately vertical direction (Z direction). For example, the air conditioner **1** may include a first deodorizing device and a second deodorizing device. However, the number of deodorizing devices **40** is not limited.
[0144] For example, the first deodorizing device may be disposed above the first dust collector. For example, the second deodorizing device may be disposed above the second dust collector. For example, the first blower may be positioned between the first dust collector and the second dust collector. For example, the second dust collector may be spaced above the first dust collector with the first blower therebetween. For example, the first blower may be positioned between the first deodorizing device and the second dust collector. For example, the second blower may be disposed above the second dust collector. For example, the second blower may be disposed above the second dust collector. For example, the second blower may be disposed above the second dust collector to move air that has passed through the second dust collector toward the outlet portion **13***b*. For example, the second blower may be disposed above the second deodorizing device. For example,

the second blower may be disposed above the second deodorizing device to move air that has passed through the second deodorizing device toward the outlet portion **13***b*. However, the disclosure is not limited to the above-described examples, and the positions of the dust collector **50**, the deodorizing device **40**, and the blower **30** are not limited to the above-described examples.
[0145] For example, the blower **30**, the deodorizing device **40**, and the dust collector **50** arranged below and the components related thereto may be omitted from the air conditioner **1**.
[0146] The dust collector **50** may be positioned on the flow path **20**. The deodorizing device **40** may be positioned on the flow path **20**. The blower **30** may be positioned on the flow path **20**. For example, air flowing into the flow path **20** through the inlet portion **13***a* may flow to the outlet portion **13***b* after passing through the dust collector **50**, the deodorizing device **40**, and the blower **30**. The air flowing to the outlet portion **13***b* may exit from the flow path **20**.
[0147] FIG. **4** is an exploded view illustrating a discharge device separated from a housing of an air conditioner according to an embodiment of the disclosure.
[0148] FIG. **5** is an exploded view illustrating a discharge device according to an embodiment of the disclosure.
[0149] FIG. **6** is a cross-sectional view of a portion of a discharge device according to an embodiment of the disclosure.
[0150] Referring to FIGS. **4**, **5**, and **6**, the air conditioner **1** 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 part **11***a* of the frame body **11**. The discharge device **100** may be positioned between the upper part **11***a* of the frame body **11** and the upper frame **16**.
[0151] The air conditioner **1** according to an embodiment of the disclosure may include a discharge hole **16***a* formed on the upper frame **16**. The discharge hole **16***a* may be formed to face a different direction from the direction in which the outlet portion **13***b* faces. For example, the discharge hole **16***a* may be formed to face upward. The discharge hole **16***a* may be formed at an end of a flow path formed between the blower **30** and the outlet portion **13***b*. Air blown by the blower **30** may be discharged to the outside of the housing **10** through the outlet portion **13***b* or the discharge hole **16***a*.
[0152] The discharge device **100** may open and close the discharge hole **16***a*. The discharge device **100** may guide a portion of the air blown to the outlet portion **13***b* by the blower **30** to the discharge hole **16***a*.
[0153] The discharge device **100** may include a base **101**. The base **101** may be fixed to the housing **10**. The base **101** may be mounted and fixed to the frame body **11**. The base **101** may support various components of the discharge device **100**. For example, the base **101** may include a driving source case **104** for mounting a cover lift motor **102** and a cover rotation motor **103**.
[0154] The discharge device **100** may include the cover lift motor **102** mounted on the base **101**. The cover lift motor **102** may provide power for moving a discharge cover **110**. For example, the cover lift motor **102** may be disposed at a right rear corner of the base **101**. The discharge cover **110** may move up or down according to an operation of the cover lift motor **102**. The cover lift motor **102** may move the discharge cover **110** between a lower position and an upper position along a third direction. The third direction being perpendicular to the first direction and the second direction which are the rotational directions of the rotation transmission part **140**.
[0155] For example, the discharge device **100** may include a moving gear **102***a* for transmitting the power of the cover lift motor **102** to a rotating member **120**. The cover lift motor **102** may include the moving gear **102***a*. The cover lift motor **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.
[0156] The discharge device **100** may include the cover rotation motor **103** mounted on the base **101**. The cover rotation motor **103** may provide power for rotating the discharge cover **110**. For

example, the cover rotation motor **103** may be disposed at a left rear corner of the base **101**. The cover rotation motor **103** may include a step motor. The discharge cover **110** may rotate clockwise or counterclockwise according to an operation of the cover rotation motor **103**.
[0157] For example, the discharge device **100** may include a rotating gear **103***a* for transmitting the power of the cover rotation motor **103** to a rotation transmission part **140**. The cover rotation motor **103** may include the rotating gear **103***a*. The cover rotation motor **103** may be connected to the rotation transmission part **140** through the rotating gear **103***a*. For example, the rotating gear **103***a* may include a plurality of gears.
[0158] The rotation transmission part **140** may also be referred to as a discharge cover rotor, a rotation carrier, or a rotation transmitter. The rotation transmission part **140** may be referred to by various terms in addition to the above terms.
[0159] The discharge device **100** may be configured to allow the cover rotation motor **103** to be fixed to the base **101** while the discharge cover **110** moves. In addition, the discharge device **100** may be configured to allow the cover lift motor **102** to be fixed to the base **101** while the discharge cover **110** rotates. Because the cover lift motor **102** and the cover rotation motor **103** are both fixed to the base **101**, the cover lift motor **102** and the cover rotation motor **103** do not move while the discharge cover **110** moves or rotates, thereby improving an operational stability of the discharge device **100**.
[0160] In the discharge device **100** of the air conditioner **1** according to the disclosure, both the cover lift motor **102** and the cover rotation motor **103** are fixed to the base **101**, and thus the cover lift motor **102** and the cover rotation motor **103** do not move while the discharge cover **110** moves or rotates. Accordingly, wires connected to the cover lift motor **102** and/or the cover rotation motor **103** may be prevented from moving or becoming tangled or broken and causing failure.
[0161] In the discharge device **100** of the air conditioner **1**, both the cover lift motor **102** and the cover rotation motor **103** are fixed to the base **101**, and thus the cover lift motor **102** and the cover rotation motor **103** do not move while the discharge cover **110** moves or rotates. Accordingly, safety may be prevented from being reduced due to the weight of the driving sources (e.g., cover lift motor **102** and cover rotation motor **103**).
[0162] The discharge device **100** may include the discharge cover **110**. The discharge cover **110** may open and close the discharge hole **16***a*. The discharge cover **110** may 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.
[0163] The discharge cover **110** may include a cover opening **117** formed on a portion of an outer circumference of the discharge cover **110**. The cover opening **117** may be located inside the housing **10** when the discharge cover **110** closes the discharge hole **16***a*. At least a portion of the cover opening **117** may be located outside the housing **10** when the discharge cover **110** opens the discharge hole **16***a*. For example, the cover opening **117** may be formed to allow the air discharged in an approximately vertical direction from the housing **10** through the discharge hole **16***a* to be directed in an approximately horizontal direction.
[0164] The discharge cover **110** may be coupled to a switching member **130**. The discharge cover **110** may be rotatably coupled to the switching member **130**. The discharge cover **110** may be coupled to the switching member **130** to move up and down together with the switching member **130**. The discharge cover **110** may be coupled to the switching member **130** so as to be rotatable with respect to the switching member **130** and also to be movable up and down together with the switching member **130**.
[0165] 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 switching 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 switching member **130** may have a shape that protrudes inward from an inner circumferential surface of the switching

member **130**.

[0166] The discharge cover **110** may be coupled to the rotation transmission part **140** so as to be rotatable together with the rotation transmission part **140**. The discharge cover **110** may be coupled to the rotation transmission part **140** so as to be movable with respect to the rotation transmission part **140**. For example, the discharge cover **110** may rotate clockwise or counterclockwise together with the rotation transmission part **140**. The discharge cover **110** may be coupled to the rotation transmission part **140** so as to be movable up and down with respect to the rotation transmission part **140**.

[0167] The discharge cover **110** may include a cover coupler **115** (see FIG. **9**) that is movably coupled to a part coupler **145** of the rotation transmission part **140**. The part coupler **145** of the rotation transmission part **140** may extend along a movement direction (e.g., up and down) of the discharge cover **110**. For example, the cover coupler **115** may have a shape that protrudes inward from an 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 inserted. As the part coupler **145** of the rotation transmission part **140** and the cover coupler **115** of the discharge cover **110** are coupled, the discharge cover **110** and the rotation transmission part **140** may rotate together. Separate rotation of the discharge cover **110** and the rotation transmission part **140** may be limited.

[0168] While the discharge cover **110** opens the discharge hole **16***a*, a portion of the air blown by the blower **30** may be discharged to the outside of the housing **10** through the outlet portion **13***b*, and another portion of the air blown by the blower **30** may be discharged to the outside of the housing **10** through the discharge hole **16***a*.

[0169] The discharge device **100** may include the movement transmission parts **120**, **130** and **106** for receiving power from the cover lift motor **102** to move the discharge cover **110**. For example, the movement transmission parts **120**, **130** and **106** may include the rotating member **120**, the switching member **130**, and a movement support **106**.

[0170] The discharge device **100** may include the rotating member **120**. The rotating member **120** may be rotatable relative 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 cover lift motor **102**. The rotating member **120** may be connected to the moving gear **102***a* of the cover lift motor **102**.

[0171] The rotating member **120** may include a moving gear connector **121** for connecting to the cover lift motor **102**. The moving gear connector **121** may be provided along at least a portion of an outer circumference of the rotating member **120**. The moving gear connector **121** may have a gear shape. For example, as the moving gear **102***a* of the cover lift motor **102** and the moving gear connector **121** of the rotating member **120** are connected, the rotating member **120** may receive a rotational force from the cover lift motor **102** and may rotate.

[0172] The rotating member **120** may include a movement guide **123** for guiding the movement of the switching member **130**. The movement guide **123** may extend in the movement direction of the discharge cover **110**. For example, the movement guide **123** may extend in a vertical direction. The movement guide **123** may be coupled to a movement coupler **133** of the switching member **130**. For example, the movement coupler **133** of the switching member **130** may have a protruding shape, and the movement guide **123** may have a slit shape into which the movement coupler **133** is slidably inserted. For example, the number of movement guides **123** may be provided in a single number or a plurality of numbers corresponding to the number of movement couplers **133**.

[0173] The discharge device **100** may include the switching member **130**. The switching member **130** may be coupled to the rotating member **120** so as to be rotatable together with the rotating member **120**. The switching member **130** may be coupled to the rotating member **120** so as to be movable relative to the rotating member **120**. For example, the switching member **130** may have a ring shape.

[0174] The switching member **130** may include the movement coupler **133** that is movably coupled to the movement guide **123** of the rotating member **120**. For example, the movement coupler **133** may have a shape that protrudes outward from an outer circumference of the switching member **130**, and the movement guide **123** may have a slit shape into which the movement coupler **133** is slidably inserted. For example, the number of movement couplers **133** may be provided in a single number or a plurality of numbers corresponding to the number of movement guides **123**. As the movement coupler **133** moves up and down along the movement guide **123**, the switching member **130** may move up and down with respect to the rotating member **120**.

[0175] The switching member **130** may include the rotation coupler **131** that is rotatably coupled to the rotation support **111** of the discharge cover **110**. The switching member **130** may be configured such that movement relative to the discharge cover **110** is limited as the rotation support **111** and the rotation coupler **131** are coupled. For example, the rotation coupler **131** may have a shape that protrudes inward from the inner circumferential surface of the switching member **130**, and the rotation support **111** of the discharge cover **110** may have a groove shape formed on the outer circumference of the discharge cover **110**.

[0176] The switching member **130** may be coupled to the discharge cover **110** so as to be movable together with the discharge cover **110**. The switching member **130** may be coupled to the discharge cover **110** so as to be rotatable with respect to the discharge cover **110**.

[0177] The discharge device **100** may include the movement support **106**. The movement support **106** may guide the movement of the switching member **130** while the rotating member **120** rotates. The movement support **106** may guide the vertical movement of the switching member **130**. For example, the movement support **106** may be formed integrally with the base **101**.

[0178] The movement support **106** may have an inclined shape to allow the movement coupler **133** of the switching member **130** to move in a vertical direction while the switching member **130** rotates. The movement support **106** may extend along an outer edge of the switching member **130**. For example, the movement support **106** may be formed such that an upwardly inclined portion and a downwardly inclined portion are repeated along the outer edge of the switching member **130**. The movement support **106** may support the movement coupler **133** of the switching member **130**. The movement coupler **133** of the switching member **130** may slide along the movement support **106**.

[0179] The discharge device **100** may include a movement cover **150** to form a movement rail **107** (see FIG. **8**) for the movement coupler **133** of the switching member **130** together with the movement support **106**. The movement cover **150** may be seated on the base **101**. The movement cover **150** may be supported by at least a portion of the movement support **106** of the base **101**. The movement cover **150** may include a cover inclined portion **151** corresponding to the incline portion of the movement support **106**. The movement coupler **133** of the switching member **130** may move along the movement rail **107** formed by the movement support **106** and the movement cover **150**. For example, the movement rail **107** may be formed in three or more portions along the edge of the switching member **130**.

[0180] The discharge device **100** may include the rotation transmission part **140**. The rotation transmission part **140** may receive power from the cover rotation motor **103** and rotate the discharge cover **110**. The rotation transmission part **140** may also be referred to as a discharge cover rotor, a rotation carrier, or a rotation transmitter. The rotation transmission part **140** may be referred to by various terms in addition to the above terms.

[0181] The rotation transmission part **140** may include a rotating gear connector **141** to connect with the cover rotation motor **103**. The rotating gear connector **141** may be provided along at least a portion of an outer circumference of the rotation transmission part **140**. The rotating gear connector **141** may have a gear shape. For example, as the rotating gear **103***a* of the cover rotation motor **103** and the rotating gear connector **141** of the rotation transmission part **140** are connected, the rotation transmission part **140** may receive a rotational force from the cover rotation motor **103** and may rotate.

[0182] The rotation transmission part **140** may include the part coupler **145** extending along the movement direction (e.g., up and down) of the discharge cover **110**. The part coupler **145** of the rotation transmission part **140** may be coupled to the cover coupler **115** 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 to be slidably inserted into the part coupler **145**.

[0183] The discharge device **100** may be configured such that the rotation transmission part **140** rotates as the cover rotation motor **103** operates, and the discharge cover **110** rotates without movement as the rotation transmission part **140** rotates. As the part coupler **145** and the cover coupler **115** are coupled, the discharge cover **110** is limited from rotating separately from the rotation transmission part **140**, but may move up and down with respect to the rotation transmission part **140**.

[0184] 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 air blown by the blower **30** through the discharge hole **16***a* while the discharge cover **110** opens the discharge hole **16***a*. The fan device **160** may include a fan case **162** on which the discharge fan **161** is mounted.

[0185] For example, while the fan device **160** operates, the air conditioner **1** may discharge a greater amount of air through the discharge hole **16***a* than the amount of air discharged through the outlet portion **13***b* among the air blown by the blower **30**. While the fan device **160** operates, the air discharged from the discharge hole **16***a* may reach a longer distance from the air conditioner **1**. In addition, while the fan device **160** operates, a movement speed of the air discharged from the discharge hole **16***a* may become faster.

[0186] Referring to FIG. **6**, in the discharge device **100** of the air conditioner **1**, based on a rotation axis of the discharge fan **161**, the discharge cover **110** and the switching member **130** may be disposed outside the rotation transmission part **140**. The movement support **106** and the movement cover **150** may be disposed outside the discharge cover **110** and the switching member **130**. The rotating member **120** may be disposed outside the movement support **106** and the movement cover **150**.

[0187] FIG. **7** illustrates a state in which a discharge device closes a discharge hole according to an embodiment of the disclosure.

[0188] FIG. **8** illustrates a coupling relationship between components related to movement of a discharge cover in a state where a discharge device closes a discharge hole according to an embodiment of the disclosure.

[0189] FIG. **9** illustrates lower parts of components related to movement of a discharge cover in a state where a discharge device closes a discharge hole according to an embodiment of the disclosure.

[0190] Referring to FIGS. **7**, **8**, and **9**, a state in which the discharge device **100** closes the discharge hole **16***a* is described. When the discharge device **100** closes the discharge hole **16***a*, the movement coupler **133** of the switching member **130** may be located at a lower portion of the movement guide **123** of the rotating member **120**. The movement coupler **133** of the switching member **130** may be located at a lower portion of the movement support **106**. The cover coupler **115** of the discharge cover **110** may be located at a lower portion of the part coupler **145** of the rotation transmission part **140**.

[0191] FIG. **10** illustrates a state in which a discharge device opens a discharge hole according to an embodiment of the disclosure.

[0192] FIG. **11** illustrates a coupling relationship between components related to movement of a discharge cover in a state where a discharge device opens a discharge hole according to an embodiment of the disclosure.

[0193] FIG. **12** illustrates lower parts of components related to movement of a discharge cover in a state where a discharge device opens a discharge hole according to an embodiment of the disclosure.

[0194] Referring to FIGS. **10**, **11**, and **12**, a state in which the discharge device **100** opens the

discharge hole **16***a* is described. When the discharge device **100** opens the discharge hole **16***a*, the movement coupler **133** of the switching member **130** may be located at an upper portion of the movement guide **123** of the rotating member **120**. The movement coupler **133** of the switching member **130** may be located at an upper portion of the movement support **106**. The cover coupler **115** of the discharge cover **110** may be located at an upper portion of the part coupler **145** of the rotation transmission part **140**.
[0195] As the cover lift motor **102** operates, the rotating member **120** of the discharge device **100** may rotate. As the rotating member **120** rotates, the switching member **130** may rotate and move upward. As the switching member **130** rotates and moves upward, the discharge cover **110** may move upward without rotation and may open the discharge hole **16***a*.
[0196] As the rotating member **120** rotates, the movement coupler **133** inserted into the movement guide **123** of the rotating member **120** moves in the direction that rotates the switching member **130**. While the movement coupler **133** moves in the direction that rotates the switching member **130**, the movement coupler **133** moves on the movement support **106**, and because the movement support **106** has an upwardly inclined shape, the movement coupler **133** moves upward. As the movement coupler **133** moves upward, the discharge cover **110** coupled to move up and down together with the switching member **130** moves upward.
[0197] While moving upward, the discharge cover **110** moves upward without rotation due to an engagement between the part coupler **145** of the rotation transmission part **140** and the cover coupler **115** of the discharge cover **110**.
[0198] In order for the discharge device **100** to close the discharge hole **16***a* after the discharge hole **16***a* has been opened, the above-described process may be performed in reverse. The cover lift motor **102** generates a rotational force in the opposite direction to that used when the discharge cover **110** moves upward, and the rotating member **120** rotates. As the rotating member **120** rotates, the switching member **130** rotates and moves downward, and as the switching member **130** rotates and moves downward, the discharge cover **110** may move downward without rotation and may close the discharge hole **16***a*.
[0199] FIG. **13** illustrates a coupling relationship between components related to a rotation of a discharge cover in a state where a discharge device opens a discharge hole according to an embodiment of the disclosure.
[0200] FIG. **14** illustrates a state where a discharge cover of a discharge device is rotated according to an embodiment of the disclosure.
[0201] FIG. **15** illustrates a coupling relationship between components related to a rotation of a discharge cover in a state where the discharge cover of a discharge device is rotated according to an embodiment of the disclosure.
[0202] Referring to FIGS. **10**, **13**, **14**, and **15**, a rotation operation of the discharge cover **110** of the discharge device **100** is described. The discharge cover **110** of the discharge device **100** may rotate from the state shown in FIGS. **10** and **13** to the state shown in FIGS. **14** and **15**.
[0203] As the cover rotation motor **103** operates, the rotation transmission part **140** rotates, and as the rotation transmission part **140** rotates, the discharge cover **110** may rotate without moving in a vertical direction due to the engagement between the part coupler **145** and the cover coupler **115**. Because the switching member **130** is configured to be rotatable separately from the rotation of the discharge cover **110**, the switching member **130** may not rotate despite the rotation of the discharge cover **110**.
[0204] In order for the discharge cover **110** of the discharge device **100** to be rotated from the state shown in FIGS. **14** and **15** to the state shown in FIGS. **10** and **13**, the above-described process may be performed in reverse. The cover rotation motor **103** may generate a rotational force in the opposite direction to the above-described direction, and thus the rotation transmission part **140** and the discharge cover **110** may rotate in the opposite direction.
[0205] As such, the air conditioner **1** according to an embodiment may guide a portion of the air

blown toward the outlet portion **13***b* to the discharge hole **16***a*, and may discharge the air in various ways.
[0206] FIG. **16** is a top view of a partial configuration of a discharge device according to an embodiment of the disclosure.
[0207] FIG. **17** illustrates a magnet provided in a rotation transmission part of the discharge device shown in FIG. **16** according to an embodiment of the disclosure.
[0208] FIG. **18** illustrates sensors provided in a fan case of the discharge device shown in FIG. **16** according to an embodiment of the disclosure.
[0209] Referring to FIGS. **16**, **17**, and **18**, an upper surface of the rotation transmission part **140** may have a circular shape. In addition, the upper surface of the rotation transmission part **140** may have a grille shape in which a plurality of holes are formed. As described above, the rotation transmission part **140** may be connected to the cover rotation motor **103** through the rotating gear **103***a*. The rotation transmission part **140** may rotate clockwise or counterclockwise depending on an operation of the cover rotation motor **103**.
[0210] The discharge fan **161** may be mounted on the fan case **162**. A portion of the fan case **162** may have a shape corresponding to the shape of the rotation transmission part **140**. For example, the fan case **162** may include a circular structure **162***a* and a support **162***b* formed integrally with the circular structure **162***a* or coupled to the circular structure **162***a*. The support **162***b* may be formed to surround a portion of an outer circumference of the circular structure **162***a*.
[0211] A magnet **146** may be provided at a position of the rotation transmission part **140**. The magnet **146** may be fixed at a position of the rotation transmission part **140**. For example, the magnet **146** may be provided at a position of an outer portion (e.g., an upper edge) of the rotation transmission part **140**. In addition, the magnet **146** may be located on the opposite side of the part coupler **145** based on the center of the rotation transmission part **140**. The magnet **146** may identify a reference position of the rotation transmission part **140**, and may also be referred to as a ‘position identifier’.
[0212] The fan case **162** may be provided with a first sensor **210** and a second sensor **220** to detect the magnet **146**. In addition, the fan case **162** may be provided with a third sensor **230** to detect the magnet **146**. The first sensor **210**, the second sensor **220**, and the third sensor **230** may be provided in the fan case **162** to face the magnet **146** that moves by the rotation of the rotation transmission part **140**.
[0213] The first sensor **210** may be disposed at a first position of the fan case **162**. The second sensor **220** may be disposed at a second position of the fan case **162** that is spaced apart from the first position. The first position of the first sensor **210** and the second position of the second sensor **220** may have a predetermined angle with respect to the center of the fan case. The third sensor **230** may be disposed at a third position of the fan case **162**, which is spaced apart from the first position and the second position.
[0214] For example, based on the center of the fan case **162** (center of the circular structure **162***a*), a first angle between the first position of the first sensor **210** and the second position of the second sensor **220**, a second angle between the second position of the second sensor **220** and the third position of the third sensor **230**, and a third angle between the third position of the third sensor **230** and the first position of the first sensor **210** may be determined variously depending on the design. For example, the first angle, the second angle, and the third angle may be the same.
[0215] The first sensor **210**, the second sensor **220**, and the third sensor **230** may each include a magnetic sensor that may detect a magnetic force of the magnet **146**. For example, the first sensor **210**, the second sensor **220**, and the third sensor **230** may be tunnel magneto-resistance (TMR).
[0216] As the rotation transmission part **140** rotates clockwise or counterclockwise, the magnet **146** may also rotate clockwise or counterclockwise. When the magnet **146** moves and approaches the first sensor **210**, the second sensor **220**, or the third sensor **230**, the first sensor **210**, the second sensor **220**, or the third sensor **230** may detect the magnet **146**.

[0217] FIG. **19** is a control block diagram of an air conditioner according to an embodiment of the disclosure.

[0218] Referring to FIG. **19**, the air conditioner **1** according to the disclosure may include the cover rotation motor **103**, the first sensor **210**, the second sensor **220**, memory **250**, and a processor **260**. In addition, the air conditioner **1** may include the blower **30**, the cover lift motor **102**, and the fan device **160**. The air conditioner **1** may further include at least one of the deodorizing device **40**, the dust collector **50**, the third sensor **230**, or a user interface **240**.

[0219] The memory **250** may store programs and data for controlling an operation of the air conditioner **1**. The processor **260** may be electrically connected to various components of the air conditioner **1** and may control each of the components.

[0220] The processor **260** may be hardware and may include logic circuitry and arithmetic circuitry. The processor **260** may control the electrically connected components of the air conditioner **1** using the programs, instructions and/or data stored in the memory **250** for an operation of the air conditioner **1**. The processor **260** and the memory **250** may be implemented as separate chips or a single chip. In addition, at least one processor and at least one memory may be provided.

[0221] The processor **260** may include at least one of a central processing unit (CPU), graphics processing unit (GPU), accelerated processing unit (APU), many integrated core (MIC), digital signal processor (DSP), neural processing unit (NPU), hardware accelerator, or machine learning accelerator.

[0222] The memory **250** may store programs, applications, instructions and/or data for the operation of the air conditioner **1**, and may store data generated by the processor **260**. For example, the memory **250** may store programs, applications, instructions and/or data for performing a cooling operation, a heating operation, and a dehumidifying operation.

[0223] The memory **250** 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 **250** may include a non-volatile memory, such as a read only memory (ROM) and a flash memory for long-term storage of data.

[0224] The memory **250** may be implemented as memory embedded in the air conditioner **1** or as memory detachable from the air conditioner **1** depending on a data storage use. For example, data for driving the air conditioner **1** may be stored in the memory embedded in the air conditioner **1**, and data for an extended function of the air conditioner **1** may be stored in the memory detachable from the air conditioner **1**.

[0225] The blower **30** may rotate to create an air flow flowing inside the housing **10**. The processor **260** may control the blower **30**, and may adjust a rotation speed of the blower **30**. Each of the plurality of blowers **30** may be independently controlled by the processor **260**.

[0226] The fan device **160** may be controlled to discharge a portion of the air blown by the blower **30** through the discharge hole **16***a*, while the discharge hole **16***a* is open. The fan device **160** may boost the movement of the air generated by the blower **30**. The amount of air discharged through the discharge hole **16***a* and the movement speed of the air may be increased by the operation of the fan device **160**. The processor **260** may control the fan device **160**, and may adjust a rotation speed of the fan device **160**.

[0227] The deodorizing device **40** may remove odorous substances from the air. In addition, the deodorizing device **40** may sterilize the air by decomposing organic substances in the air. The deodorizing device **40** may include the light source device **41** and the photocatalytic filter **42**. The processor **260** may control an operation of the deodorizing device **40**. The processor **260** may control the power supplied to the deodorizing device **40**. The processor **260** may adjust the power supplied to each of the light source device **41** and the photocatalytic filter **42**.

[0228] The dust collector **50** may collect aerosols in the air that has passed through the deodorizing device **40**. For example, the dust collector **50** may include an electric dust collector that generates ions to charge aerosols and collect the charged aerosols. The processor **260** may control an operation of the dust collector **50**. The processor **260** may control the power supplied to the dust collector **50**.

[0229] The cover lift motor **102** may generate power to move the discharge cover **110** up and down. The cover lift motor **102** may be connected to the rotating member **120** through the moving gear **102***a*. The rotating member **120** may rotate according to an operation of the cover lift motor **102**, and the discharge cover **110** may move up or down according to the rotation of the rotating member **120**. The processor **260** may change a moving direction of the discharge cover **110** by controlling a rotating direction of the cover lift motor **102**.

[0230] The cover rotation motor **103** may generate power to rotate the discharge cover **110**. The cover rotation motor **103** may be connected to the rotation transmission part **140** through the rotating gear **103***a*. The rotation transmission part **140** may rotate according to an operation of the cover rotation motor **103**, and the discharge cover **110** may rotate clockwise or counterclockwise according to the rotation of the rotation transmission part **140**. The processor **260** may change a rotating direction of the discharge cover **110** by controlling a rotating direction of the cover rotation motor **103**. The rotation transmission part **140** may also be referred to as a discharge cover rotor, a rotation carrier, or a rotation transmitter. The rotation transmission part **140** may be referred to by various terms in addition to the above terms.

[0231] The cover rotation motor **103** may include a step motor. The step motor is a type of direct current (DC) brushless motor, and includes a stator and a rotor with small teeth that mesh with each other. The step motor may slowly rotate at a certain angle according to a current flowing in stator coils. In existing technologies, an open loop control that does not require feedback on a rotation and position of the step motor is used as a control method of the step motor. However, because the open loop control does not provide feedback on the rotation and position of the step motor, in a case where a rotating body rotated by the step motor deviates from a reference position, the rotating body may not be accurately rotated to a target position.

[0232] For example, the rotation transmission part **140** may deviate from a reference position due to various causes (e.g., external force, temporary malfunction of the motor, etc.). In a case where the rotation transmission part **140** deviates from the reference position, the discharge cover **110** also deviates from the reference position. Air may be discharged through the cover opening **117** of the discharge cover **110**, and a wind direction may be adjusted by the rotation of the discharge cover **110**. In a case where the discharge cover **110** deviates from the reference position, the cover opening **117** may not be accurately aligned with a target direction, and thus the wind direction adjustment may not be accurately performed.

[0233] In order to overcome the above, the air conditioner **1** according to the disclosure may easily move the rotation transmission part **140** to the reference position by providing feedback on the position of the rotation transmission part **140**. The air conditioner **1** may provide feedback on the position of the rotation transmission part **140** by using a position identifier (e.g., the magnet **146**) provided at a position of the rotation transmission part **140** and a plurality of sensors (e.g., the first sensor **210** and the second sensor **220**) detecting the position identifier.

[0234] The first sensor **210**, the second sensor **220**, and the third sensor **230** may detect the position identifier (e.g., the magnet **146**) fixed at a position of the rotation transmission part **140**. Each of the first sensor **210**, the second sensor **220**, and the third sensor **230** may transmit an electrical signal (e.g., a magnet detection signal) corresponding to the detection of the position identifier (e.g., the magnet **146**) to the processor **260**. The processor **260** may identify the position of the rotation transmission part **140** based on the detection signals transmitted from each of the first sensor **210**, the second sensor **220**, and the third sensor **230**.

[0235] In a case where the magnet **146** is provided at a position of the rotation transmission part **140**, as the rotation transmission part **140** rotates clockwise or counterclockwise, the magnet **146** may also rotate clockwise or counterclockwise. For example, in FIG. **18**, in a case where the

rotation transmission part **140** starts to rotate clockwise in a state where the magnet **146** is positioned between the first sensor **210** and the third sensor **230** of the fan case **162**, the magnet **146** may reach the first sensor **210** before the second sensor **220**. In a case where the rotation transmission part **140** rotates clockwise in a state where the magnet **146** is positioned between the first sensor **210** and the second sensor **220**, the magnet **146** may reach the second sensor **220** first.
[0236] The processor **260** may control the cover rotation motor **103** to move the rotation transmission part **140** to the reference position. For example, the processor **260** may control the cover rotation motor **103** to move the rotation transmission part **140** to the reference position based on a power off condition of the air conditioner **1** being satisfied. The reference position may be replaced by various terms such as a default position or a start position.
[0237] The power off condition of the air conditioner **1** may vary. For example, the processor **260** may determine that the power off condition is satisfied based on obtaining a power off command through the user interface **240** of the air conditioner **1** or a user device. The processor **260** may determine that the power off condition is satisfied based on an elapse of an operation time set through the user interface **240** of the air conditioner **1** or the user device.
[0238] The first position of the first sensor **210** may be set as the reference position of the rotation transmission part **140**. In a case where the magnet **146** is detected by the first sensor **210**, the processor **260** may determine that the rotation transmission part **140** has reached the reference position and may stop the operation of the cover rotation motor **103**. In a case where the magnet **146** is detected by the second sensor **220** or the third sensor **230**, the processor **260** may determine that the rotation transmission part **140** has not reached the reference position and may continuously operate the cover rotation motor **103**.
[0239] For example, the processor **260** may control the cover rotation motor **103** to rotate the rotation transmission part **140** in a first direction (e.g., clockwise) based on the power off condition of the air conditioner **1** being satisfied. The processor **260** may control the cover rotation motor **103** to rotate the rotation transmission part **140** in a second direction (e.g., counterclockwise) based on the magnet **146** of the rotation transmission part **140** being detected by the second sensor **220**.
[0240] Because the reference position is the position of the first sensor **210**, in a case where the magnet **146** is first detected by the second sensor **220**, the processor **260** may rotate the rotation transmission part **140** in the opposite direction, thereby moving the magnet **146** to the first position of the first sensor **210**. By changing the rotation direction to allow the rotation transmission part **140** to move to the reference position, the rotation amount of the cover rotation motor **103** may be reduced, and the time required for the rotation transmission part **140** to reach the reference position may be reduced.
[0241] As another example, the processor **260** may control the cover rotation motor **103** to rotate the rotation transmission part **140** in the first direction (e.g., clockwise) based on the power off condition of the air conditioner **1** being satisfied, and may control the cover rotation motor **103** to continue to rotate the rotation transmission part **140** in the first direction (e.g., clockwise) based on the magnet **146** being detected by the third sensor **230**. In a case where the rotation transmission part **140** continuously rotates in the first direction (e.g., clockwise) and the magnet **146** is detected by the first sensor **210**, the processor **260** may stop the operation of the cover rotation motor **103**. The third sensor **230** may be omitted, but the cover rotation motor **103** may be controlled more accurately by using the third sensor **230**.
[0242] As still another example, in a case where the rotation transmission part **140** first rotates in the second direction (e.g., counterclockwise) and the magnet **146** is first detected by the third sensor **230**, the rotation transmission part **140** may be controlled to rotate in the first direction (e.g., clockwise). In a case where the magnet **146** is detected by the first sensor **210**, the processor **260** may determine that the rotation transmission part **140** has reached the reference position and may stop the operation of the cover rotation motor **103**.
[0243] The reference position of the rotation transmission part **140** may also be set to the second

position of the second sensor **220** or the third position of the third sensor **230**. In a case where the reference position of the rotation transmission part **140** is set to the second position of the second sensor **220**, the processor **260** may stop the operation of the cover rotation motor **103** in response to the magnet **146** being detected by the second sensor **220**. In a case where the reference position of the rotation transmission part **140** is set to the third position of the third sensor **230**, the processor **260** may stop the operation of the cover rotation motor **103** in response to the magnet **146** being detected by the third sensor **230**.

[0244] The first sensor **210**, the second sensor **220**, and the third sensor **230** are not limited to a magnetic sensor. For example, the first sensor **210**, the second sensor **220**, and the third sensor **230** may be provided as an electrode sensor, and the rotation transmission part **140** may be provided with an electrode instead of the magnet **146**. When the electrode of the rotation transmission part **140** rotates and approaches the first sensor **210**, the second sensor **220**, or the third sensor **230**, the first sensor **210**, the second sensor **220**, or the third sensor **230** may detect an electric force of the electrode. Each of the first sensor **210**, the second sensor **220**, and the third sensor **230** may transmit an electrical signal (i.e., an electrode detection signal) corresponding to the detection of the electrode to the processor **260**.

[0245] In addition to the above, various position identifiers and sensors may be used to identify the rotation and reference position of the rotation transmission part **140**.

[0246] As such, the air conditioner **1** according to the disclosure may accurately move the rotation transmission part **140** to the reference position by feedback control of the cover rotation motor **103** rotating the rotation transmission part **140**. Accordingly, failure of wind direction control caused by deviation of the rotation transmission part **140** from the reference position may be prevented.

[0247] The user interface **240** may obtain a user input, and may output various information. The user interface **240** may include an input interface and an output interface. A user may interact with the air conditioner **1** through the user interface **240**.

[0248] The input interface may obtain a user input. The input interface may transmit an electrical signal corresponding to the user input to the processor **260**. The user input may include various commands. For example, the input interface may obtain a power on command, a power off command, an operation mode setting command, a wind direction adjustment command, or a wind speed adjustment command. The user input may also be obtained from a user device (e.g., a mobile device, a smartphone). The processor **260** may control the air conditioner **1** based on the user input obtained through the input interface.

[0249] The input interface may include various buttons. For example, the input interface may include a power button to turn the air conditioner **1** on or off, an operation mode setting button to set an operation mode of the air conditioner **1**, a wind direction adjustment button to adjust a wind direction, and a wind speed adjustment button to adjust a wind speed. Each button may include a visual indicator (e.g., text, an image, icon, etc.) that may indicate its function.

[0250] A “button” may be implemented as a user interface element (UI element), a tact switch, a push switch, a slide switch, a toggle switch, a micro switch, a touch switch, a touch pad, and/or a touch screen. In addition, a button may be replaced by a jog dial or a microphone, and the like.

[0251] The output interface may be controlled by the processor **260** to output various information related to an operation of the air conditioner **1**. For example, the output interface may output various information such as an operation mode, wind direction, wind speed, and operation time of the air conditioner **1**. The output interface may output visual information and/or auditory information.

[0252] The output interface may include at least one of a liquid crystal display (LCD) panel, an indicator, a light emitting diode (LED) panel, an organic light emitting diode (OLED) panel, a micro-LED panel, or a speaker.

[0253] The output interface may display information input by the user or information provided to the user on various screens. The output interface may display information related to the operation

of the air conditioner **1** as at least one of an image or text. The output interface may display a graphical user interface (GUI) that enables control of the air conditioner **1**.
[0254] The configuration of the air conditioner **1** is not limited to that shown in FIG. **19**. The air conditioner **1** may further include other components in addition to the components shown, or may not include some of the components shown. For example, the air conditioner **1** may further include at least one of a temperature sensor detecting a temperature of air, a humidity sensor detecting a humidity of the air, or a communication interface communicating with an external device.
[0255] The communication interface may perform wired communication and/or wireless communication with an external device (e.g., a user device, a server, a home appliance, etc.). The communication interface may be controlled to transmit data to the external device or receive data from the external device.
[0256] The communication interface may include at least one of a short-range wireless communication circuit or a long-range wireless communication circuit. The communication interface may establish a direct (e.g., wired) communication channel or a wireless communication channel, and support the performance of the communication through the established communication channel. The communication interface may include a wireless communication circuit (e.g., a cellular communication circuit, a short-range wireless communication circuit, or a global navigation satellite system (GNSS) communication circuit) and/or a wired communication circuit (e.g., a local area network (LAN) communication circuit, or a power line communication circuit).
[0257] The communication interface may communicate with an external device through a short-range wireless communication network (e.g., Bluetooth, wireless fidelity (Wi-Fi) direct, or infrared data association (IrDA)) or a long-range wireless communication network (e.g., a legacy cellular network, a fifth generation (5G) network, a next-generation communication network, the Internet, or a computer network (e.g., LAN or wide area network (WAN)).
[0258] The short-range wireless communication circuit may include a Bluetooth communication circuit, a Bluetooth Low Energy (BLE) communication circuit, a near field communication circuit, a WLAN (Wi-Fi) communication circuit, and a Zigbee communication circuit, an infrared data association (IrDA) communication circuit, a Wi-Fi Direct (WFD) communication circuit, an ultrawideband (UWB) communication circuit, an Ant+ communication circuit, a microwave (uWave) communication circuit, etc., but is not limited thereto.
[0259] The long-range wireless communication circuit may include a communication circuit that performs various types of long-range wireless communication, and may include a mobile communication interface. The mobile communication interface transmits and receives radio signals with at least one of a base station, an external terminal, or a server on a mobile communication network.
[0260] In addition, the communication interface may communicate with an external device through an access point (AP).
[0261] FIG. **20** is a flowchart briefly illustrating a method for controlling an air conditioner according to an embodiment of the disclosure.
[0262] Referring to FIG. **20**, the processor **260** of the air conditioner **1** may identify whether a power off condition of the air conditioner **1** is satisfied in operation **2001**. The power off condition of the air conditioner **1** may vary. For example, the processor **260** may determine that the power off condition is satisfied based on obtaining a power off command through the user interface **240** of the air conditioner **1** or a user device. The processor **260** may determine that the power off condition is satisfied based on an elapse of an operation time set through the user interface **240** of the air conditioner **1** or the user device.
[0263] The processor **260** of the air conditioner **1** may control the cover rotation motor **103** to move the rotation transmission part **140** to a reference position based on the power off condition of the air conditioner **1** being satisfied in operation **2002**. The processor **260** of the air conditioner **1**

may determine whether to stop an operation of the cover rotation motor **103** based on whether the magnet **146** is detected by the first sensor **210** or the second sensor **220** in operation **2003**.

[0264] FIG. **21** is a flowchart illustrating a method for controlling an air conditioner according to an embodiment of the disclosure.

[0265] Referring to FIG. **21**, the processor **260** of the air conditioner **1** may identify whether a power off condition of the air conditioner **1** is satisfied in operation **2101**. Operation **2101** corresponds to operation **2001** described in FIG. **20**.

[0266] The processor **260** of the air conditioner **1** may rotate the cover rotation motor **103** in a first direction (e.g., clockwise) in operation **2102**, based on the power off condition of the air conditioner **1** being satisfied. When the cover rotation motor **103** rotates in the first direction, the rotation transmission part **140** may also rotate in the first direction.

[0267] The processor **260** may identify whether the magnet **146** of the rotation transmission part **140** is detected by the first sensor **210** in operation **2103**, as the cover rotation motor **103** rotates in the first direction. In a case where the magnet **146** of the rotation transmission part **140** is detected by the first sensor **210**, the processor **260** may stop the cover rotation motor **103** in operation **2107**. The processor **260** may determine that the rotation transmission part **140** has reached the reference position based on the magnet **146** being detected by the first sensor **210**.

[0268] In a case where the rotation transmission part **140** rotates in the first direction, the magnet **146** of the rotation transmission part **140** may be first detected by the second sensor **220** rather than the first sensor **210**. The processor **260** may identify whether the magnet **146** of the rotation transmission part **140** is detected by the second sensor **220** according to the operation of the cover rotation motor **103** in operation **2104**. In a case where the magnet **146** of the rotation transmission part **140** is not also detected by the second sensor **220**, the processor **260** may continuously rotate the cover rotation motor **103** in the first direction until the magnet **146** is detected by the first sensor **210**.

[0269] The processor **260** may rotate the cover rotation motor **103** in a second direction (e.g., counterclockwise) based on the magnet **146** of the rotation transmission part **140** being detected by the second sensor **220** in operation **2105**. When the cover rotation motor **103** rotates in the second direction, the rotation transmission part **140** may also rotate in the second direction.

[0270] The processor **260** may identify whether the magnet **146** is detected by the first sensor **210** in operation **2106**, as the cover rotation motor **103** rotates in the second direction. The processor **260** may rotate the cover rotation motor **103** in the second direction until the magnet **146** is detected by the first sensor **210**. In a case where the magnet **146** of the rotation transmission part **140** is detected by the first sensor **210**, the processor **260** may stop the cover rotation motor **103** in operation **2107**.

[0271] According to an embodiment, an air conditioner **1** may include: a housing **10**; a discharge cover **110** configured to cover a discharge hole **16***a* formed on an upper part of the housing, and including a cover opening **117** through which air is discharged; a rotation transmission part **140** coupled to the discharge cover and configured to rotate the discharge cover; a cover rotation motor **103** configured to rotate the rotation transmission part in a first direction or a second direction opposite to the first direction; a fan case **162** equipped with a discharge fan **161** configured to move air toward the discharge hole and the cover opening; a magnet **146** provided at a position of the rotation transmission part; a first sensor **210** disposed at a first position of the fan case and configured to detect the magnet; a second sensor **220** disposed at a second position of the fan case and configured to detect the magnet, the second position being spaced apart from the first position; and a processor **260**. The processor **260** may be configured to control the cover rotation motor to move the rotation transmission part to a reference position based on a power off condition of the air conditioner being satisfied, and determine whether to stop an operation of the cover rotation motor based on whether the magnet is detected by the first sensor or the second sensor.

[0272] The processor may be configured to stop the operation of the cover rotation motor based on

the magnet being detected by the first sensor.
[0273] The processor may be configured to control the cover rotation motor to rotate the rotation transmission part in the first direction based on the power off condition of the air conditioner being satisfied, and control the cover rotation motor to rotate the rotation transmission part in the second direction based on the magnet being detected by the second sensor.
[0274] The air conditioner **1** may further include a third sensor disposed at a third position of the fan case and configured to detect the magnet, the third position being spaced apart from the first position and the second position. The processor may be configured to control the cover rotation motor to rotate the rotation transmission part in the first direction based on the power off condition of the air conditioner being satisfied, and control the cover rotation motor to continuously rotate the rotation transmission part in the first direction based on the magnet being detected by the third sensor.
[0275] The magnet may be provided on an outer circumference of the rotation transmission part having a circular shape. The first sensor and the second sensor may be disposed on the fan case to face the magnet moved by rotation of the rotation transmission part. The first position and the second position may have a defined angle based on a center of the fan case.
[0276] The air conditioner **1** may further include a third sensor disposed at a third position of the fan case and configured to detect the magnet, the third position being spaced apart from the first position and the second position. A first angle between the first position and the second position, a second angle between the second position and the third position, and a third angle between the third position and the first position may be equal based on the center of the fan case.
[0277] The processor may be configured to determine that the power off condition is satisfied based on obtaining a power off command through a user interface or a user device
[0278] The processor may be configured to determine that the power off condition is satisfied based on an elapse of an operation time which is set through a user interface or a user device.
[0279] The cover rotation motor may include a step motor.
[0280] The cover lift motor may move the discharge cover between a lower position and an upper position along a third direction, the third direction being perpendicular to the first direction and the second direction.
[0281] The cover lift motor and the cover rotation motor are fixed to a base of the housing.
[0282] According to an embodiment, in a method for controlling an air conditioner including a discharge hole formed on an upper part of a housing, a discharge cover configured to cover the discharge hole and including a cover opening through which air is discharged, a fan case equipped with a discharge fan configured to move air toward the discharge hole and the cover opening, and a processor, the method may include: identifying, by the processor, whether a power off condition of the air conditioner is satisfied; controlling a cover rotation motor configured to rotate a rotation transmission part coupled to the discharge cover so as to move the rotation transmission part to a reference position based on the power off condition of the air conditioner being satisfied; identifying whether a magnet provided at a position of the rotation transmission part is detected by a first sensor disposed at a first position of the fan case or a second sensor disposed at a second position of the fan case, the second position being spaced apart from the first position; and determining whether to stop an operation of the cover rotation motor based on whether the magnet is detected by the first sensor or the second sensor.
[0283] The determining of whether to stop the operation of the cover rotation motor may include stopping the operation of the cover rotation motor based on the magnet being detected by the first sensor.
[0284] The controlling of the cover rotation motor may include: controlling the cover rotation motor to rotate the rotation transmission part in a first direction based on the power off condition of the air conditioner being satisfied; and controlling the cover rotation motor to rotate the rotation transmission part in a second direction based on the magnet being detected by the second sensor.

[0285] The air conditioner **1** may further include a third sensor disposed at a third position of the fan case and configured to detect the magnet, the third position being spaced apart from the first position and the second position. The controlling of the cover rotation motor may include: controlling the cover rotation motor to rotate the rotation transmission part in a first direction based on the power off condition of the air conditioner being satisfied, and controlling the cover rotation motor to continuously rotate the rotation transmission part in the first direction based on the magnet being detected by the third sensor.

[0286] The identifying of whether the power off condition is satisfied may include determining that the power off condition is satisfied based on obtaining a power off command through a user interface or a user device.

[0287] The identifying of whether the power off condition is satisfied may include determining that the power off condition is satisfied based on an elapse of an operation time which is set through a user interface or a user device.

[0288] According to the disclosure, the air conditioner and the method for controlling the same may easily move the discharge cover and the rotation transmission part that rotates the discharge cover to the reference position.

[0289] According to the disclosure, the air conditioner and the method for controlling the same may feedback control the cover rotation motor that rotates the rotation transmission part, thereby accurately moving the rotation transmission part to the reference position.

[0290] The effects that may achieved by the disclosure are not limited to the above-mentioned effects, and other effects not mentioned will be clearly understood by one of ordinary skill in the technical art to which the disclosure belongs from the following description.

[0291] The disclosed embodiments may be implemented in the form of a recording medium that stores instructions executable by a computer. The instructions may be stored in the form of program codes, and when executed by one or more processors individually or collectively, the instructions may create a program module to perform operations of the disclosed embodiments.

[0292] The machine-readable recording medium may be provided in the form of a non-transitory storage medium. Here, when a storage medium is referred to as “non-transitory,” it may be understood that the storage medium is tangible and does not include a signal (e.g., an electromagnetic wave), but rather that data is semi-permanently or temporarily stored in the storage medium. For example, a “non-transitory storage medium” may include a buffer in which data is temporarily stored.

[0293] According to an embodiment, the method according to the various embodiments disclosed herein may be provided in a computer program product. The computer program product may be traded between a seller and a buyer as a product. The computer program product may be distributed in the form of a machine-readable storage medium (e.g., compact disc read only memory (CD-ROM)), or may be distributed (e.g., download or upload) through an application store (e.g., Play Store™) online or directly between two user devices (e.g., smartphones). In the case of online distribution, at least a portion of the computer program product (e.g., downloadable app) may be stored at least semi-permanently or may be temporarily generated in a storage medium, such as memory of a server of a manufacturer, a server of an application store, or a relay server.

[0294] It will be appreciated that various embodiments of the disclosure according to the claims and description in the specification can be realized in the form of hardware, software or a combination of hardware and software.

[0295] Any such software may be stored in non-transitory computer readable storage media. The non-transitory computer readable storage media store one or more computer programs (software modules), the one or more computer programs include computer-executable instructions that, when executed by one or more processors of an electronic device individually or collectively, cause the electronic device to perform a method of the disclosure.

[0296] Any such software may be stored in the form of volatile or non-volatile storage such as, for

example, a storage device like read only memory (ROM), whether erasable or rewritable or not, or in the form of memory such as, for example, random access memory (RAM), memory chips, device or integrated circuits or on an optically or magnetically readable medium such as, for example, a compact disk (CD), digital versatile disc (DVD), magnetic disk or magnetic tape or the like. It will be appreciated that the storage devices and storage media are various embodiments of non-transitory machine-readable storage that are suitable for storing a computer program or computer programs comprising instructions that, when executed, implement various embodiments of the disclosure. Accordingly, various embodiments provide a program comprising code for implementing apparatus or a method as claimed in any one of the claims of this specification and a non-transitory machine-readable storage storing such a program.
[0297] While the disclosure has been shown and described with reference to various embodiments thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the disclosure as defined by the appended claims and their equivalents.

Claims

1. An air conditioner, comprising: a housing; a discharge cover configured to cover a discharge hole formed on an upper part of the housing, and including a cover opening through which air is discharged; a rotation transmission part coupled to the discharge cover and configured to rotate the discharge cover; a cover rotation motor configured to rotate the rotation transmission part in a first direction or a second direction opposite to the first direction; a fan case equipped with a discharge fan configured to move air toward the discharge hole and the cover opening; a magnet provided at a position of the rotation transmission part; a first sensor disposed at a first position of the fan case and configured to detect the magnet; a second sensor disposed at a second position of the fan case and configured to detect the magnet, the second position being spaced apart from the first position; memory storing one or more computer programs; and one or more processors communicatively coupled to the cover rotation motor, the first sensor, the second sensor, and the memory, wherein the one or more computer programs include computer-executable instructions that, when executed by the one or more processors individually or collectively, cause the air conditioner to: move the rotation transmission part, via the cover rotation motor, to a reference position based on a power off condition of the air conditioner being satisfied, and determine whether to stop an operation of the cover rotation motor based on whether the magnet is detected by the first sensor or the second sensor.
2. The air conditioner of claim 1, wherein the one or more computer programs further include computer-executable instructions that, when executed by the one or more processors individually or collectively, cause the air conditioner to stop the operation of the cover rotation motor based on the magnet being detected by the first sensor.
3. The air conditioner of claim 2, wherein the one or more computer programs further include computer-executable instructions that, when executed by the one or more processors individually or collectively, cause the air conditioner to: control the cover rotation motor to rotate the rotation transmission part in the first direction based on the power off condition of the air conditioner being satisfied, and control the cover rotation motor to rotate the rotation transmission part in the second direction based on the magnet being detected by the second sensor.
4. The air conditioner of claim 2, further comprising: a third sensor disposed at a third position of the fan case and configured to detect the magnet, the third position being spaced apart from the first position and the second position, wherein the one or more computer programs further include computer-executable instructions that, when executed by the one or more processors individually or collectively, cause the air conditioner to: control the cover rotation motor to rotate the rotation transmission part in the first direction based on the power off condition of the air conditioner being

satisfied, and control the cover rotation motor to continuously rotate the rotation transmission part in the first direction based on the magnet being detected by the third sensor.
5. The air conditioner of claim 1, wherein the magnet is provided on an outer circumference of the rotation transmission part having a circular shape, wherein the first sensor and the second sensor are disposed on the fan case to face the magnet moved by rotation of the rotation transmission part, and wherein the first position and the second position have a defined angle based on a center of the fan case.
6. The air conditioner of claim 5, further comprising: a third sensor disposed at a third position of the fan case and configured to detect the magnet, the third position being spaced apart from the first position and the second position, wherein a first angle between the first position and the second position, a second angle between the second position and the third position, and a third angle between the third position and the first position are equal based on the center of the fan case.
7. The air conditioner of claim 1, wherein the one or more computer programs further include computer-executable instructions that, when executed by the one or more processors individually or collectively, cause the air conditioner to determine that the power off condition is satisfied based on obtaining a power off command through a user interface or a user device.
8. The air conditioner of claim 1, wherein the one or more computer programs further include computer-executable instructions that, when executed by the one or more processors individually or collectively, cause the air conditioner to determine that the power off condition is satisfied based on an elapse of an operation time which is set through a user interface or a user device.
9. The air conditioner of claim 1, wherein the cover rotation motor includes a step motor.
10. The air conditioner of claim 1, further comprising a cover lift motor configured to move the discharge cover between a lower position and an upper position along a third direction, the third direction being perpendicular to the first direction and the second direction.
11. The air conditioner of claim 10, wherein the cover lift motor and the cover rotation motor are fixed to a base of the housing.
12. A method for controlling an air conditioner comprising a discharge hole formed on an upper part of a housing, a discharge cover configured to cover the discharge hole and including a cover opening through which air is discharged, a fan case equipped with a discharge fan configured to move air toward the discharge hole and the cover opening, and a processor, the method comprising: identifying, by the processor, whether a power off condition of the air conditioner is satisfied; controlling a cover rotation motor to rotate a rotation transmission part coupled to the discharge cover so as to move the rotation transmission part to a reference position based on the power off condition of the air conditioner being satisfied; identifying whether a magnet provided at a position of the rotation transmission part is detected by a first sensor disposed at a first position of the fan case or a second sensor disposed at a second position of the fan case, the second position being spaced apart from the first position; and determining whether to stop an operation of the cover rotation motor based on whether the magnet is detected by the first sensor or the second sensor.
13. The method of claim 12, wherein the determining of whether to stop the operation of the cover rotation motor comprises stopping the operation of the cover rotation motor based on the magnet being detected by the first sensor.
14. The method of claim 13, wherein the controlling of the cover rotation motor comprises: controlling the cover rotation motor to rotate the rotation transmission part in a first direction based on the power off condition of the air conditioner being satisfied; and controlling the cover rotation motor to rotate the rotation transmission part in a second direction based on the magnet being detected by the second sensor.
15. The method of claim 13, wherein the air conditioner further comprises a third sensor disposed at a third position of the fan case and configured to detect the magnet, the third position being spaced apart from the first position and the second position, and wherein the controlling of the cover rotation motor comprises: controlling the cover rotation motor to rotate the rotation

transmission part in a first direction based on the power off condition of the air conditioner being satisfied, and controlling the cover rotation motor to continuously rotate the rotation transmission part in the first direction based on the magnet being detected by the third sensor.

16. The method of claim 12, wherein the identifying of whether the power off condition is satisfied comprises determining that the power off condition is satisfied based on obtaining a power off command through a user interface or a user device.

17. The method of claim 12, wherein the identifying of whether the power off condition is satisfied comprises determining that the power off condition is satisfied based on an elapse of an operation time which is set through a user interface or a user device.

18. One or more non-transitory computer-readable storage media storing one or more computer programs including computer-executable instructions that, when executed by one or more processors of an air conditioner individually or collectively, cause the air conditioner to perform operations, the operations comprising: identifying, by the processor, whether a power off condition of the air conditioner is satisfied; rotating, via a cover rotation motor, a rotation transmission part coupled to a discharge cover so as to move the rotation transmission part to a reference position based on the power off condition of the air conditioner being satisfied; identifying whether a magnet provided at a position of the rotation transmission part is detected by a first sensor disposed at a first position of a fan case or a second sensor disposed at a second position of the fan case, the second position being spaced apart from the first position; and determining whether to stop an operation of the cover rotation motor based on whether the magnet is detected by the first sensor or the second sensor.

19. The one or more non-transitory computer-readable storage media of claim 18, the operations further comprising: stopping the operation of the cover rotation motor based on the magnet being detected by the first sensor; rotating, via the cover rotation motor, the rotation transmission part in a first direction based on the power off condition of the air conditioner being satisfied; and rotating, via the cover rotation motor, the rotation transmission part in a second direction based on the magnet being detected by the second sensor.