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(54) **AIR-CONDITIONING INDOOR UNIT AND AIR CONDITIONER**

(57) An air-conditioning indoor unit (100) and an air conditioner are provided. The air-conditioning indoor unit (100) has a surface frame (1), a breezeless member (2), an outer deflector (12), a heat exchanger (3), and a fan (4). The surface frame (1) has a first air outlet (11) defined on a front lower part of the surface frame. The first air outlet (11) penetrates a front part and a bottom of the surface frame (1). The breezeless member (2) is dis-

posed at a front side of the surface frame (1). The outer deflector (12) is capable of opening and closing a bottom side of the first air outlet (11). The breezeless member (2) is configured to open a front side of the first air outlet (11) when located at a first position, and to close the front side of the first air outlet (11) when located at a second position.

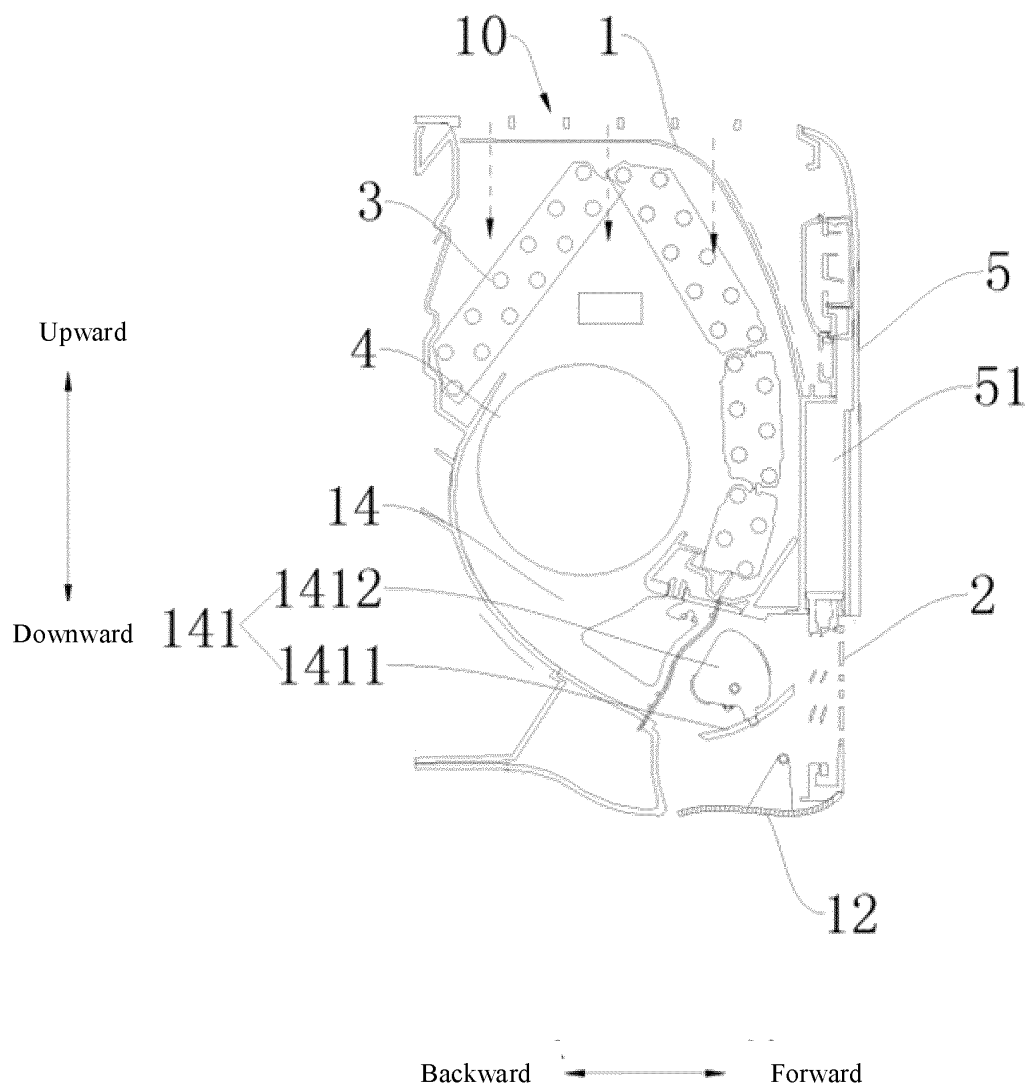


FIG. 4

Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present application is submitted based on and claims priorities to Chinese Patent Applications No. 202020136413.3 and No. 202010062830.2, filed on January 19, 2020, the entire contents of which are incorporated herein by reference.

FIELD

[0002] The present disclosure relates to the field of air handling devices, and more particularly, to an air-conditioning indoor unit and an air conditioner.

BACKGROUND

[0003] In the related industry, in order to prevent cold air from blowing across people, an air-conditioning indoor unit usually adopts solutions, such as adjusting an angle of a deflector to alter an air outlet direction and opening holes on the deflector, the louver, the panel, and other members to soften an airflow. Although these designs can soften air outflux, they have a significant impact on the outflowing of the air from the air-conditioning indoor unit. That is, a volume of air blown from the air-conditioning indoor unit is constrained. Therefore, a refrigerating capacity of the air-conditioning indoor unit in a cooling mode is reduced. In addition, it is difficult for a monotonous air blowing mode of the air-conditioning indoor unit to meet a user's requirements for different air blowing effects and regulation of an indoor temperature of the air-conditioning indoor unit.

SUMMARY

[0004] The present disclosure aims at solving at least one of the technical problems in the related art. To this end, the present disclosure provides an air-conditioning indoor unit. The air-conditioning indoor unit has a large outlet air volume, a large outlet air scope, a large refrigerating capacity in a breezeless mode, and diversified air blowing modes, and thus is capable of better meeting a user's requirements for different air blowing effects and regulation of an indoor temperature of the air-conditioning indoor unit.

[0005] The present disclosure also provides an air conditioner including the above-mentioned air-conditioning indoor unit.

[0006] According to an embodiment in a first aspect of the present disclosure, an air-conditioning indoor unit includes: a surface frame having an air inlet defined thereon and a first air outlet defined on a front lower part thereof, wherein the first air outlet forwardly penetrates a front part of the surface frame and downwardly penetrates a bottom of the surface frame; a breezeless member configured to scatter air and arranged at a front side

of the surface frame in a manner that the breezeless member is movable between a first position and a second position; an outer deflector movably disposed at the first air outlet, the outer deflector is capable of opening and closing a bottom side of the first air outlet; a heat exchanger disposed within the surface frame; and a fan disposed within the surface frame. In a first position, the breezeless member opens a front side of the first air outlet, and in a second position, closes the front side of the first air outlet when located at the second position.

[0007] According to the air-conditioning indoor unit provided by the present disclosure, the first air outlet is defined on the front lower part of the surface frame. The first air outlet forwardly penetrates the front part of the surface frame and downwardly penetrates the bottom of the surface frame to allow the air-conditioning indoor unit to blow air from the front part and the bottom of the surface frame simultaneously. In this manner, an outlet air volume and an outlet air coverage are increased. The front side of the first air outlet can be closed by the breezeless member in the second position. Thus, it is possible to prevent cold air from being blown directly across the human body, so that air is blown gently, thereby realizing a breezeless air blowing mode. In addition, the air-conditioning indoor unit has a large refrigerating capacity in the breezeless mode. Through different cooperating manners between the breezeless member and the outer deflector, air blowing modes of the air-conditioning indoor unit are diversified to better meet user's requirements for different air blowing effects and regulation of an indoor temperature of the air-conditioning indoor unit.

[0008] According to some embodiments of the present disclosure, the surface frame has a second air outlet defined on at least one of a left end or a right end thereof.

[0009] According to some embodiments of the present disclosure, the surface frame has a panel disposed at the front side thereof. A receiving chamber is defined between the panel and the surface frame. The breezeless member in the first position is received within the receiving chamber.

[0010] According to some embodiments of the present disclosure, when the air-conditioning indoor unit is in an OFF state, the bottom side of the first air outlet is closed by the outer deflector, and the front side of the first air outlet is closed by the breezeless member. The breezeless member abuts the outer deflector to form an abutting line which is located at the front side of the first air outlet.

[0011] According to some embodiments of the present disclosure, the air-conditioning indoor unit has a first operation mode group. In the first operation mode group, the front side of the first air outlet is opened by the breezeless member, and the bottom side of the first air outlet is at least partially opened by the outer deflector.

[0012] Further, the first operation mode group includes at least one of a first operation mode or a second operation mode. In the first operation mode, the front side of the first air outlet is opened by the breezeless member, and the bottom side of the first air outlet is partially opened

by the outer deflector. In the second operation mode, the front side of the first air outlet is opened by the breezeless member, and the bottom side of the first air outlet is opened by the outer deflector, and the air blown from the first air outlet is guided downwardly by moving and positioning the outer deflector at the front side of the first air outlet.

[0013] According to some embodiments of the present disclosure, the air-conditioning indoor unit also has a second operation mode group. In the second operation mode group, the front side of the first air outlet is closed by the breezeless member, and the bottom side of the first air outlet is at least partially closed by the outer deflector.

[0014] Further, the second operation mode group includes at least one of a third operation mode or a fourth operation mode. In the third operation mode, the front side of the first air outlet is closed by the breezeless member, and the bottom side of the first air outlet is closed by the outer deflector. In the fourth operation mode, the front side of the first air outlet is closed by the breezeless member, and the outer deflector has one end abutting the breezeless member and another end spaced apart from the bottom of the surface frame to partially open the bottom side of the first air outlet.

[0015] According to some embodiments of the present disclosure, the outer deflector is rotatably disposed at the first air outlet.

[0016] According to some embodiments of the present disclosure, the outer deflector is disposed at the bottom side of the first air outlet and capable of moving forwards and backwards.

[0017] Further, the outer deflector is driven by a drive mechanism to move forwards and backwards. The drive mechanism includes: a motor; a gear disposed on an output shaft of the motor; and a rack disposed on the outer deflector and extending in a forward-backward direction. The gear is adapted to be engaged with the rack.

[0018] Further, an accommodation chamber is defined on a lower end of the surface frame. The motor and the gear are disposed within the accommodation chamber. The rack is at least partially accommodated within the accommodation chamber.

[0019] Further, when the bottom side of the first air outlet is opened by the outer deflector, the rack is entirely accommodated within the accommodation chamber, and the outer deflector is at least partially accommodated within the accommodation chamber.

[0020] According to some embodiments of the present disclosure, the breezeless member includes: for scattering air, an air-scattering plate, and an air-scattering device disposed on the air-scattering plate and located on an inner side of the air-scattering plate. The air-scattering plate has a first air-scattering structure formed thereon. The air-scattering device includes a mounting plate having a plurality of first ventilation holes defined thereon and connected to the air-scattering plate, and a first air scattering mechanism disposed within the plurality of first ventilation holes and comprising at least one of a first

stationary blade or a first movable blade. The first stationary blade is opposite to the first movable blade.

[0021] According to some embodiments of the present disclosure, the outer deflector has a second air-scattering structure formed thereon.

[0022] In an embodiment, the second air-scattering structure is a plurality of air-scattering holes formed on the outer deflector; or the outer deflector is formed into a grid form having a hollow structure as the second air-scattering structure; or the second air-scattering structure includes a plurality of second ventilation holes formed on the outer deflector and a plurality of second air-scattering mechanisms disposed in the plurality of second ventilation holes, respectively. Each of plurality of second air-scattering mechanism includes at least one of a second stationary blade or a second movable blade. The stationary blade is opposite to the second movable blade.

[0023] According to some embodiments of the present disclosure, a first drive motor for driving the outer deflector is disposed on the surface frame or on a base of the air-conditioning indoor unit.

[0024] According to some embodiments of the present disclosure, the surface frame has an air outlet passage defined therein and in communication with the first air outlet. The air outlet passage has a rotatable flow guide device provided therein. The rotatable flow guide device is rotatable and configured to divide air out of the air outlet passage into a volume of air blown towards the front side of the first air outlet and a volume of air blown towards the bottom side of the first air outlet.

[0025] According to some embodiments of the present disclosure, the rotatable flow guide device is rotatable by 360°.

[0026] According to some embodiments of the present disclosure, the rotatable flow guide device includes an inner deflector that is rotatable. The inner deflector has a rotation axis located at or close to a middle thereof.

[0027] According to some embodiments of the present disclosure, the rotatable flow guide device includes an inner deflector that is rotatable, and a louver disposed on the inner deflector.

[0028] According to some embodiments of the present disclosure, when the air-conditioning indoor unit is in an OFF state, an air outlet end of the air outlet passage is closed by the rotatable flow guide device.

[0029] According to some embodiments of the present disclosure, the rotatable flow guide device is driven to rotate by a second drive motor disposed on the surface frame or on the base of the air-conditioning indoor unit.

[0030] According to an embodiment in a second aspect of the present disclosure, an air conditioner includes an air-conditioning indoor unit according to the above embodiments in the first aspect of the present disclosure.

[0031] For the air conditioner according to the present disclosure, by providing the above-mentioned air-conditioning indoor unit, it is possible to prevent cold air from being blown directly across the human body, so that the air

is blown gently, thereby realizing the breezeless air blowing mode. In addition, the air-conditioning indoor unit has a large cooling capacity in the breezeless mode, which solves a problem of an insufficient outlet air volume occurred when the air conditioner offers a mild air sense. Moreover, diversified air blowing modes of the air conditioner improve user experience.

[0032] Additional aspects and advantages of the present disclosure will be provided at least in part in the following description, or will become apparent at least in part from the following description, or can be learned from practicing of the present disclosure.

BRIEF DESCRIPTION OF DRAWINGS

[0033] The above and/or additional aspects and advantages of the present disclosure will become more apparent and more understandable from the following description of embodiments taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a front view of an air-conditioning indoor unit according to some embodiments of the present disclosure, in which a breezeless member is located at a second position.

FIG. 2 is a front view of the air-conditioning indoor unit in FIG. 1 in another state, in which the breezeless member is located at a first position.

FIG. 3 is a perspective view of the air-conditioning indoor unit in FIG. 1, in which the breezeless member is at located the second position.

FIG. 4 is a cross-sectional view of the air-conditioning indoor unit in FIG. 1, in which the breezeless member is located at the second position.

FIG. 5 is a cross-sectional view of an air-conditioning indoor unit according to some embodiments of the present disclosure, in which the air-conditioning indoor unit is in a first operation mode.

FIG. 6 is a cross-sectional view of an air-conditioning indoor unit according to some embodiments of the present disclosure, in which the air-conditioning indoor unit is in a second operation mode.

FIG. 7 is a cross-sectional view of an air-conditioning indoor unit according to some embodiments of the present disclosure, in which the air-conditioning indoor unit is in a third operation mode.

FIG. 8 is a cross-sectional view of an air-conditioning indoor unit according to some embodiments of the present disclosure, in which the air-conditioning indoor unit is in a fourth operation mode.

FIG. 9 is a cross-sectional view of an air-conditioning indoor unit according to some other embodiments of the present disclosure, in which the air-conditioning indoor unit is in a third operation mode.

FIG. 10 is a cross-sectional view of an air-conditioning indoor unit according to some other embodiments of the present disclosure, in which the air-conditioning indoor unit is in a second operation

mode.

FIG. 11 is a schematic view of the air-conditioning indoor unit in FIG. 3 in another view, in which a breezeless member is located at a second position.

FIG. 12 is a schematic view of an air-conditioning indoor unit according to yet other embodiments of the present disclosure, in which a breezeless member is located at a second position.

FIG. 13 is a schematic view of an air-conditioning indoor unit according to still yet other embodiments of the present disclosure, in which a breezeless member is located at a second position.

FIG. 14 is a partial structural view of a breezeless member according to some embodiments of the present disclosure.

Reference Signs:

[0034]

air-conditioning indoor unit 100; air inlet 10; surface frame 1; first air outlet 11; outer deflector 12; second air-scattering structure 121; second ventilation hole 123; gear 124; rack 125; second air-scattering mechanism 126; second air outlet 13; air outlet passage 14; rotatable flow guide device 141; inner deflector 1411; louver 1412; accommodation chamber 15; breezeless member 2; air-scattering plate 21; first air-scattering structure 211; air-scattering device 22; mounting plate 221; first ventilation hole 2211; first air-scattering mechanism 222; first stationary blade 2221; first movable blade 2222; limiting plate 23; third ventilation hole 231; drive assembly 24; heat exchanger 3; fan 4; panel 5; receiving chamber 51.

DESCRIPTION OF EMBODIMENTS

[0035] Embodiments of the present disclosure will be described in detail below with reference to examples thereof as illustrated in the accompanying drawings, throughout which same or similar elements, or elements having same or similar functions, are denoted by same or similar reference signs. The embodiments described below with reference to the drawings are illustrative only, and are intended to explain, rather than limiting, the present disclosure.

[0036] An air-conditioning indoor unit 100 according to an embodiment of the present disclosure will be described below with reference to the accompanying drawings. Dashed arrows in each of FIG. 3 to FIG. 10 illustrate a flow direction of an airflow.

[0037] Referring to FIG. 1 and FIG. 4, according to an embodiment in a first aspect of the present disclosure, the air-conditioning indoor unit 100 includes a surface frame 1, a breezeless member 2, a heat exchanger 3,

and a fan 4. The surface frame 1 has an air inlet 10 defined thereon and a first air outlet 11 defined on a front lower part thereof. The first air outlet 11 forwardly penetrates a front part of the surface frame 1 and downwardly penetrates a bottom of the surface frame 1. The breezeless member 2 is configured to scatter air, and is arranged at a front side of the surface frame 1 in a manner that the breezeless member 2 is movable between a first position and a second position. For example, the first air outlet 11 extends in a leftward-rightward direction, and the breezeless member 2 is movable in an upward-downward direction. The breezeless member 2 is capable of moving downwardly to the second position when the breezeless member 2 is located at the first position, and moving upwardly to the first position when the breezeless member 2 is located at the second position. The outer deflector 12 is movably disposed at the first air outlet 11. The outer deflector 12 is capable of opening and closing a bottom side of the first air outlet 11. Both the heat exchanger 3 and the fan 4 are disposed within the surface frame 1. The fan 4 is capable of driving an external airflow to enter the air-conditioning indoor unit 100 from the air inlet 10. The external airflow is then heat exchanged with the heat exchanger 3. The heat exchanged airflow may be discharged from the first air outlet 11. Here, the airflow may not only be discharged forwardly from the front part of the surface frame 1, but also be discharged downwardly from the bottom of the surface frame 1. An airflow from the air-conditioning indoor unit 100 may be discharged forwardly and downwardly from the first air outlet 11 simultaneously to increase an outlet air volume and an outlet air coverage of the air-conditioning indoor unit 100.

[0038] In an embodiment, the air-conditioning indoor unit 100 includes a drive assembly 24 configured to drive the breezeless member 2. The drive assembly 24 may be disposed on the surface frame 1, and is capable of driving the breezeless member 24 to move in the upward-downward direction, thereby realizing a movement of the breezeless member 2 between the first position and the second position.

[0039] The front side of the first air outlet 11 is opened by the breezeless member 2 in the first position. In this case, the front side of the first air outlet 11 is completely opened by the breezeless member 2 to discharge the air from the front side of the first air outlet 11, and the air-conditioning indoor unit 100 has a large outlet air volume. The front side of the first air outlet 11 is closed by the breezeless member 2 in the second position. In this case, the front side of the first air outlet 11 is completely closed by the breezeless member 2. An airflow discharged from the front side of the first air outlet 11 may all pass through the breezeless member 2. Since the breezeless member 2 can scatter the air, the air is blown gently by the front side of the first air outlet 11 to realize breezeless air blowing, which prevents cold air from blowing directly across the human body in a cooling mode of the air-conditioning indoor unit 100, and improves user comfort.

[0040] The outer deflector 12 is movably disposed at

the first air outlet 11. The outer deflector 12 is capable of opening and closing a bottom side of the first air outlet 11. The outer deflector 12 is capable of opening, partially opening, or closing the bottom side of the first air outlet 11. When the bottom side of the first air outlet 11 is opened by the outer deflector 12, the air is discharged from the bottom side of the first air outlet 11 to allow a large volume of air to be blown from the bottom side of the first air outlet 11. The bottom side of the first air outlet 11 can be effectively closed when the bottom side of the first air outlet 11 is closed by the outer deflector 12. In an embodiment, when a user needs a small volume of air to be blown or the user only needs the air to be discharged from the front side of the surface frame 1, the bottom side of the first air outlet 11 can be closed by the outer deflector 12.

[0041] When the air-conditioning indoor unit 100 is in operation, the breezeless member 2 is at the first position. When the bottom side of the first air outlet 11 is opened by the outer deflector 12, the air can be blown from both the front side and the bottom side of the first air outlet 11 by a large volume of air. The air blown by the air-conditioning indoor unit 100 is discharged from the front side and the bottom side of the first air outlet 11 simultaneously, in which case the air-conditioning indoor unit 100 can realize quick cooling or heating. When the breezeless member 2 is in the first position and the bottom side of the first air outlet 11 is partially opened by the outer deflector 12, the air is blown from the front side of the first air outlet 11 by a large volume of air, and the air is blown from the bottom side of the first air outlet 11 by a small volume of air. The air blown by the air-conditioning indoor unit 100 is mainly discharged from the front side of the first air outlet 11. In this case, the air-conditioning indoor unit 100 is suitable for cooling, and the cold air is mainly discharged from the front side of the first air outlet 11. Such a manner is conducive to uniform indoor cooling. When the breezeless member 2 is at the first position and the bottom side of the first air outlet 11 is closed by the outer deflector 12, the air is blown from the front side of the first air outlet 11 by a large volume of air, and no air is blown from the bottom side of the first air outlet 11. In this case, the air-conditioning indoor unit 100 is suitable for cooling, and the cold air is all discharged from the front side of the first air outlet 11. Such a manner is conducive to uniform indoor cooling.

[0042] When the breezeless member 2 is in the second position and the bottom side of the first air outlet 11 is opened by the outer deflector 12, the air is blown gently from the front side of the first air outlet 11, and the air is blown from the bottom side of the first air outlet 11 by a large volume of air. Therefore, the air-conditioning indoor unit 100 blows a large volume of air while operating in a breezeless mode. In this case, the air-conditioning indoor unit 100 is suitable for quick cooling, and also can prevent cold air from blowing directly across the human body. When the breezeless member 2 is in the second position and the bottom side of the first air outlet 11 is partially

opened by the outer deflector 12, the air is blown gently from the front side of the first air outlet 11, and the air is blown from the bottom side of the first air outlet 11 by a small volume of air. In this case, the air-conditioning indoor unit 100 is suitable for cooling and for a situation where the user has a small demand for a cooling capacity. Meanwhile, it is possible to prevent the cold air from blowing directly across the human body. When the breezeless member 2 is in the second position and the bottom side of the first air outlet 11 is closed by the outer deflector 12, the air is blown gently from the front side of the first air outlet 11, and no air is blown from the bottom side of the first air outlet 11. In this case, the air-conditioning indoor unit 100 is suitable for cooling and for a situation where the user has a small demand for a cooling capacity. The air is blown gently from the air-conditioning indoor unit 100, which can prevent the cold air from blowing directly across the human body.

[0043] Air blowing modes of the air-conditioning indoor unit 100 are diversified through different cooperating manners between the breezeless member 2 and the outer deflector 12. Especially in the breezeless mode, the volume of the air blown by the air-conditioning indoor unit 100 may be adjusted by the outer deflector 12 to meet the user's requirements for different air output effects and regulation of an indoor temperature of the air-conditioning indoor unit 100.

[0044] When at the second position, the breezeless member 2 allows the air discharged from the front side of the first air outlet 11 to be blown gently. The air-conditioning indoor unit 100 may also blow the air from the bottom side of the first air outlet 11 simultaneously, even if the volume of the air blown from the front side of the first air outlet 11 is reduced when the breezeless member 2 blocks the air blown from the front side of the first air outlet 11. In this case, the air-conditioning indoor unit 100 can discharge a large total volume of the air through the first air outlet 11. Therefore, the air-conditioning indoor unit 100 has a large total volume of air while the air blown by the air-conditioning indoor unit 100 is not blown directly across the human body, in which case an indoor temperature can be adjusted quickly and the user experience can be improved.

[0045] According to the air-conditioning indoor unit 100 according to the embodiments of the present disclosure, the first air outlet 11 is defined on the front lower part of the surface frame 1. The first air outlet 11 forwardly penetrates the front part of the surface frame 1 and downwardly penetrates the bottom of the surface frame 1 to allow the air-conditioning indoor unit 100 to blow air from the front part and the bottom of the surface frame 1 simultaneously. In this manner, an outlet air volume and an outlet air coverage are increased. The front side of the first air outlet 11 can be closed by the breezeless member 2 in the second position. Thus, it is possible to prevent the cold air from being blown directly across the human body, and the air is blown gently, thereby realizing the breezeless air blowing mode. In addition, the air-con-

ditioning indoor unit 100 has a large refrigerating capacity in the breezeless mode. Through different cooperating manners between the breezeless member 2 and the outer deflector 12, air blowing modes of the air-conditioning indoor unit 100 are diversified to better meet the user's requirements for different air blowing effects and regulation of the indoor temperature of the air-conditioning indoor unit 100.

[0046] Referring to FIG. 1 to FIG. 3, according to some embodiments of the present disclosure, the surface frame 1 has a second air outlet 13 defined on at least one of a left end or a right end thereof. In an embodiment, the second air outlet 13 is defined on the left end of the surface frame 1. During air blowing of the air-conditioning indoor unit 100, when the bottom side of the first air outlet 11 is at least partially opened by the outer deflector 12, the air may be blown forwards, downwards, and leftwards to form three-dimensional (3D) air blowing. In an embodiment, the second air outlet 13 is defined on the right end of the surface frame 1. During air blowing of the air-conditioning indoor unit 100, when the bottom side of the first air outlet 11 is at least partially opened by the outer deflector 12, the air may be blown forwards, downwards, and rightwards to form 3D air blowing. In an embodiment, the second air outlet 13 is defined on each of the left end and the right end of the surface frame 1. When the bottom side of the first air outlet 11 is at least partially opened by the outer deflector 12, during air blowing of the air-conditioning indoor unit 100, the air may be blown forwards, downwards, leftwards, and rightwards to form four-dimensional (4D) air blowing. By forming the second air outlet 13, it is possible to increase the outlet air coverage of the air-conditioning indoor unit 100, realize multi-orientation air blowing of the air-conditioning indoor unit 100, and is conducive to increase a volume of the air blown by the air-conditioning indoor unit 100.

[0047] Referring to FIG. 1 to FIG. 4, according to some embodiments of the present disclosure, the surface frame 1 has a panel 5 provided at the front side thereof. A receiving chamber 51 is defined between the panel 5 and the surface frame 1. The breezeless member 2 in the first position is received within the receiving chamber 51. Such a design makes it easy to store the breezeless member 2 when the breezeless member 2 is at the first position, thereby realizing full use of an internal space of the air-conditioning indoor unit 100, and providing a compact structure for the air-conditioning indoor unit 100.

[0048] Referring to FIG. 1, according to some embodiments of the present disclosure, when the air-conditioning indoor unit 100 is in an OFF state, the bottom side of the first air outlet 11 is closed by the outer deflector 12, and the front side of the first air outlet 11 is closed by the breezeless member 2. Such a design can prevent dust or foreign objects from entering the air-conditioning indoor unit 100 via the first air outlet 11 when the air-conditioning indoor unit 100 is turned off. Meanwhile, such a design can also make the air-conditioning indoor unit 100 aesthetically pleasing. The breezeless member 2

abuts the outer deflector 12 by an abutting line located at a front side of the first air outlet 11. Here, the breezeless member 2 abutting the outer deflector 12 means that the breezeless member 2 and the outer deflector 12 abut each other. In an embodiment, a small gap may be formed between the breezeless member 2 and the outer deflector 12, or the breezeless member 2 may be in contact with the outer deflector 12.

[0049] Referring to FIG. 5 and FIG. 6, according to some embodiments of the present disclosure, the air-conditioning indoor unit 100 has a first operation mode group. In the first operation mode group, the front side of the first air outlet 11 is opened by the breezeless member 2, and the bottom side of the first air outlet 11 is at least partially opened by the outer deflector 12. In this case, the air is blown from the front side portion of the first air outlet 11 by a large volume of air, which may be further regulated by adjusting the outer deflector 12. In an embodiment, the bottom side of the first air outlet 11 is partially opened by the outer deflector 12, and thus the air is blown from the bottom side of the first air outlet 11 by a small volume of air; or the bottom side of the first air outlet 11 is opened by the outer deflector 12, and thus the air is blown from the bottom side of the first air outlet 11 by a large volume of air. In the first operation mode group, forward air blowing by the air-conditioning indoor unit 100 is not affected by the breezeless member 2, in which manner the air-conditioning indoor unit 100 can blow a large volume of air, and the outer deflector 12 can further regulate the volume of the air blown from the first air outlet 11.

[0050] Referring to FIG. 5 and FIG. 6, further, the first operation mode group includes at least one of a first operation mode and a second operation mode. In an embodiment, the first operation mode group includes the first operation mode; or the first operation mode group includes the second operation mode; or the first operation mode group includes both the first operation mode and the second operation mode. In the first operation mode, the front side of the first air outlet 11 is opened by the breezeless member 2, and the bottom side of the first air outlet 11 is partially opened by the outer deflector 12 (reference may be made to a flow direction of an airflow indicated by dashed arrows in FIG. 5). In this case, the air blown by the air-conditioning indoor unit 100 is discharged from the front side of the first air outlet 11, and the breezeless member 2 does not affect the air discharged from the front side of the first air outlet 11. In such an operation mode, the air is blown from the front side of the first air outlet 11 by a large volume of air, and the air is blown from the bottom side of the first air outlet 11 by a small volume of air. Therefore, the air-conditioning indoor unit 100 mainly blows air forwardly, but also blows air downwardly. In the second operation mode, the front side of the first air outlet 11 is opened by the breezeless member 2, and the bottom side of the first air outlet 11 is opened by the outer deflector 12, and the air blown from the first air outlet 11 is guided by moving and posi-

tioning the outer deflector 12 at the front side of the first air outlet 11 (reference may be made to a flow direction of an airflow indicated by dashed arrows in FIG. 6). In this case, the air blown by the air-conditioning indoor unit 100 is discharged from the bottom side of the first air outlet 11. In such an operation mode, the air is blown from the front side of the first air outlet 11 by a small volume of air, and the air is blown from the bottom side of the first air outlet 11 by a large volume of air. Therefore, the air-conditioning indoor unit 100 can blow air forwardly and downwardly simultaneously.

[0051] Referring to FIG. 7 and FIG. 8, according to some embodiments of the present disclosure, the air-conditioning indoor unit 100 has a second operation mode group. In the second operation mode group, the front side of the first air outlet 11 is closed by the breezeless member 2, and the bottom side of the first air outlet 11 is at least partially closed by the outer deflector 12. In this case, the air is blown gently from the front side of the first air outlet 11, and a volume of air blown by the air-conditioning indoor unit in the breezeless mode may be adjusted by the outer deflector 12. In an embodiment, the bottom side of the first air outlet 11 is partially closed by the outer deflector 12 to allow the air to be blown from the bottom side of the first air outlet 11; or the bottom side of the first air outlet 11 is closed by the outer deflector 12 to prevent the air from being blown from the bottom side of the first air outlet 11. In the second operation mode group, since the breezeless member 2 can scatter the air, the air is blown gently from the front side of the first air outlet 11 to realize breezeless air blowing. An outlet air volume in the breezeless mode may be adjusted by altering a position of the outer deflector 12. In this case, cold air can be prevented from blowing directly across the human body during the cooling operation of the air-conditioning indoor unit 100, and a total outlet air volume of the air-conditioning indoor unit 100 can be adjusted. Therefore, the user comfort can be improved.

[0052] Referring to FIG. 7 and FIG. 8, further, the second operation mode group includes at least one of a third operation mode and a fourth operation mode. In an embodiment, the second operation mode group includes the third operation mode; or the second operation mode group includes the fourth operation mode; or the second operation mode group includes both the third operation mode and the fourth operation mode. In the third operation mode, the front side of the first air outlet 11 is closed by the breezeless member 2, and the bottom side of the first air outlet 11 is closed by the outer deflector 12 (reference may be made to a flow direction of an airflow indicated by dashed arrows in FIG. 7). In this case, the air-conditioning indoor unit 100 blows air from the front side of the first air outlet 11 gently. In the third operation mode, the air-conditioning indoor unit 100 can blow the air forwardly. In the fourth operation mode, the front side of the first air outlet 11 is closed by the breezeless member 2, and the outer deflector 12 abuts the breezeless member 2 at one end thereof and is spaced apart from

the bottom portion of the surface frame 1 at the other end thereof to partially open the bottom side of the first air outlet 11 (reference may be made to a flow direction of an airflow indicated by dashed arrows in FIG. 8). In this case, the air blown by the air-conditioning indoor unit 100 is partially discharged from the front side of the first air outlet 11 and partially discharged from the bottom side of the first air outlet 11. The air discharged from the front side of the first air outlet 11 is blown gently, while an airflow is discharged from the bottom side of the first air outlet 11, in which case the air is discharged from the first air outlet 11 of the air-conditioning indoor unit 100 by a large volume of air. Therefore, the total outlet air volume of the air-conditioning indoor unit 100 is large while preventing the air blown from the air-conditioning indoor unit 100 from being blown directly across the human body, which can adjust the indoor temperature quickly and improve the user experience.

[0053] Referring to FIG. 4 to FIG. 8, according to some embodiments of the present disclosure, the outer deflector 12 is rotatably disposed at the first air outlet 11. Such a design facilitates opening or closing the bottom side of the first air outlet 11 by the outer deflector 12. The bottom side of the first air outlet 11 can be closed by the outer deflector 12 when the outer deflector 12 is rotated to extend in a substantially horizontal direction. The bottom side of the first air outlet 11 can be opened by the outer deflector 12 when the outer deflector 12 is rotated to extend in a substantially vertical direction. In addition, effectiveness of the outer deflector 12 in guiding the airflow can be adjusted by rotating the outer deflector 12 to distribute the volume of air blown by the air-conditioning indoor unit 100 forwardly and downwardly.

[0054] Referring to FIG. 9 and FIG. 10, according to some embodiments of the present disclosure, the outer deflector 12 is disposed at the bottom side of the first air outlet 11 and capable of moving forwards and backwards. Such a design facilitates opening or closing the bottom side of the first air outlet 11 by the outer deflector 12. When moved forwards, the bottom side of the first air outlet 11 can be closed by the outer deflector 12. When the outer deflector 12 moves backwards, the bottom side of the first air outlet 11 can be opened by the outer deflector 12.

[0055] Referring to FIG. 9 and FIG. 10, further, the outer deflector 12 is driven by a drive mechanism to move backwards and forwards. The drive mechanism includes a motor, a gear 124, and a rack 125. The gear 124 is disposed on an output shaft of the motor. The rack 125 is disposed on the outer deflector 12 and extends in a forward-backward direction. The gear 124 is adapted to be engaged with the rack 125. The motor may be fixed on the surface frame 1. The motor drives the gear 124 to rotate during its operation. The gear 124 is engaged with the rack 125 to allow the rack 125 to move in the forward-backward direction. Since the rack 125 is disposed on the outer deflector 12, the outer deflector 12 can be movable in the forward-backward direction.

[0056] Referring to FIG. 9 and FIG. 10, further, an accommodation chamber 15 is defined on a lower end of the surface frame 1. The motor and the gear 124 are disposed within the accommodation chamber 15. The rack 125 is at least partially accommodated within the accommodation chamber 15. In an embodiment, the rack 125 may be partially accommodated within the accommodation chamber 15; or the rack 125 may be entirely accommodated within the accommodation chamber 15. An arrangement of the accommodation chamber 15 facilitates accommodation of the motor, the gear 124, and the rack 125, makes full use of the internal space of the air-conditioning indoor unit 100, and provides a compact structure for the air-conditioning indoor unit 100. In addition, hiding the motor, the gear 124, and at least a part of the rack 125 inside the air-conditioning indoor unit 100 can enhance aesthetics of the air-conditioning indoor unit 100.

[0057] Referring to FIG. 9 and FIG. 10, further, when the bottom side of the first air outlet 11 is opened by the outer deflector 12, the rack 125 is entirely accommodated within the accommodation chamber 15, and the outer deflector 12 is at least partially accommodated within the accommodation chamber 15. In an embodiment, the outer deflector 12 is partially accommodated within the accommodation chamber 15; or the outer deflector 12 is entirely accommodated within the accommodation chamber 15. Such a design allows an outlet air area of the bottom side of the first air outlet 11 to be increased when the bottom side of the first air outlet 11 is opened by the outer deflector 12. Therefore, the volume of air blown from the first air outlet 11 is increased.

[0058] Referring to FIG. 14, according to some embodiments of the present disclosure, the breezeless member 2 includes an air-scattering device 22 configured to scatter the air and an air-scattering plate 21. The air-scattering device 22 is disposed on the air-scattering plate 21 and located at an inner side of the air-scattering plate 21. The air-scattering plate 21 is capable of protecting the air-scattering device 22. The air-scattering plate 21 has a first air-scattering structure 211 formed thereon. The first air-scattering structure 211 is capable of scattering the airflow to allow the air to be blown through the breezeless member 2 gently. In an embodiment, the first air-scattering structure 211 is a plurality of air-scattering holes; or the air-scattering plate is formed in a grid form having a hollow structure as the first air-scattering structure 211.

[0059] The air-scattering device 22 includes a mounting plate 221 and a first air-scattering mechanism 222. The mounting plate 221 has a plurality of first ventilation holes 2211 defined thereon and is connected to the air-scattering plate 21. The first air-scattering mechanism 222 is disposed within each of the plurality of first ventilation holes 2211, and includes at least one of a first relatively stationary blade 2221 or a first movable blade 2222. In an embodiment, the first air-scattering mechanism 222 includes the first stationary blade 2221 config-

ured to guide, straighten, and scatter the airflow to allow the air to be blown gently. In an embodiment, the first air-scattering mechanism 222 includes the first movable blade 2222 with a predetermined spiral orientation, which allows an airflow passing through the first movable blade 2222 to have a predetermined spiral orientation. In this case, the air blown by the first movable blade 2222 is similar to natural wind. The first movable blade 2222 may be controlled to stop rotating after being rotated by a certain angle, or the first movable blade 2222 may be controlled to keep rotating. In an embodiment, the first air-scattering mechanism 222 includes the first stationary blade 2221 and the first movable blade 2222 that may be disposed at a downstream side of the first stationary blade 2221. Such a design makes the airflow pass through the first stationary blade 2221 first, and then pass through the first movable blade 2222. The airflow is guided, rectified, and scattered by the first stationary blade 2221, and then flows through the first movable blade 2222. The first movable blade 2222 has a predetermined spiral orientation that allows the airflow to have a predetermined spiral orientation after passing through the first movable blade 2222, in which manner the air is blown gently and similar to the natural wind. The first movable blade 2222 and the first stationary blade 2221 may be arranged coaxially. Such a design makes it easy to adjust a ventilation area of the first air-scattering mechanism 222 by rotating the first movable blade 2222, and also makes it easy to arrange the first movable blade 2222 and the first stationary blade 2221.

[0060] The air-scattering device 22 also includes a limiting plate 23 connected between the mounting plate 221 and the air-scattering plate 21. The limiting plate 23 has a plurality of third ventilation holes 231 defined thereon. The plurality of third ventilation holes 231 corresponds to the plurality of first ventilation holes 2211 in a one-to-one correspondence. The limiting plate 23 is capable of limiting a position of the first air-scattering mechanism 222.

[0061] Referring to FIG. 3, FIG. 12, FIG. 13, and FIG. 14, according to some embodiments of the present disclosure, the outer deflector 12 has a second air-scattering structure 121 formed thereon. The second air-scattering structure 121 may allow the air to be blown gently. By providing the second air-scattering structure 121, it is possible to realize that when the bottom side of the first air outlet 11 is closed by the outer deflector 12, the air can still be discharged gently from the bottom side of the first air outlet 11 to increase the outlet air volume and the outlet air coverage of the air-conditioning indoor unit 100 in the breezeless mode.

[0062] Referring to FIG. 3, FIG. 11, FIG. 12, and FIG. 13, in an embodiment, the second air-scattering structure 121 is a plurality of air-scattering holes formed on the outer deflector 12. The airflow is scattered when passing through the plurality of air-scattering holes, in which case the air can be blown gently and the air-conditioning indoor unit 100 can be aesthetically pleasing. In an embodiment,

the outer deflector 12 is formed in a grid form having a hollow structure as the second air-scattering structure 121. The airflow is scattered when passing through the hollow structure, in which case the air can be blown gently and the air-conditioning indoor unit 100 can be aesthetically pleasing.

[0063] In an embodiment, the second air-scattering structure 121 includes a plurality of second ventilation holes 123 formed on the outer deflector 12 and a plurality of second air-scattering mechanisms 126 disposed in the plurality of second ventilation holes 123, respectively. Each of the plurality of second air-scattering mechanisms 126 includes at least one of a second relatively stationary blade or a second movable blade. In an embodiment, the second air-scattering mechanism 126 includes the second stationary blade configured to guide, straighten, and scatter the airflow to allow the air to be blown gently. In an embodiment, the second air-scattering mechanism 126 includes the second movable blade having a predetermined spiral orientation, which allows an airflow passing through the second movable blade to have a predetermined spiral orientation. In this case, the air blown by the second movable blade is similar to natural wind. The second movable blade may be controlled to stop rotating after being rotated by a certain angle, or the second movable blade may be controlled to keep rotating. In an embodiment, the second air-scattering mechanism 126 includes the second stationary blade and the second movable blade that may be disposed at a downstream side of the second stationary blade. Such a design allows the airflow to pass through the second stationary blade first, and then pass through the second movable blade. The airflow is guided, rectified, and scattered by the second stationary blade, and then flows through the second movable blade. The second movable blade has a predetermined spiral orientation that allows the airflow to have a predetermined spiral orientation after passing through the second movable blade, in which manner the air is blown gently and similar to the natural wind. The second movable blade and the second stationary blade may be arranged coaxially. Such a design makes it easy to adjust a ventilation area of the second air-scattering mechanism 126 by rotating the second movable blade, and also makes it easy to arrange the second movable blade and the second stationary blade.

[0064] According to some embodiments of the present disclosure, the outer deflector 12 driven to move by a first drive motor disposed on the surface frame 1 or on a base of the air-conditioning indoor unit 100. Such a manner is convenient for mounting and fixation of the first drive motor and stabilizes the mounting of the first drive motor.

[0065] Referring to FIG. 4 to FIG. 10, according to some embodiments of the present disclosure, the surface frame 1 has an air outlet passage 14 defined therein and in communication with the first air outlet 11. The air outlet passage 14 has a rotatable flow guide device 141 provided therein. The rotatable flow guide device 141 is ro-

tatable and configured to distribute the volume of air blown from the air outlet passage 14 towards each of the front side and the bottom side of the first air outlet 11. Since the air blown from the front side of the first air outlet 11 is discharged substantially forwards and the air blown from the bottom side of the first air outlet 11 is discharged substantially downwards, when the rotatable flow guide device 141 guides the airflow in the air outlet passage 14 to flow forwards, most of the airflow in the air outlet passage 14 is discharged forwards from the front side of the first air outlet 11, and a small part of the airflow in the air outlet passage 14 is discharged downwards from the bottom side of the first air outlet 11. When the rotatable flow guide device 141 guides the airflow in the air outlet passage 14 to flow downwards, most of the airflow in the air outlet passage 14 is discharged downwards from the bottom side of the first air outlet 11, and a small part of the airflow in the air outlet passage 14 is discharged forwards from the front side of the first air outlet 11. In an embodiment, when the air-conditioning indoor unit 100 is in the cooling mode, the volume of the air discharged forwards can be increased by adjusting the rotatable flow guide device 141, in which manner the cold air can reach a high indoor position to realize a uniform temperature in an indoor space. When the air-conditioning indoor unit 100 is in a heating mode, the volume of the air discharged downwards can be increased by adjusting the rotatable flow guide device 141, in which manner hot air can reach a low indoor position to realize a uniform temperature in the indoor space.

[0066] Referring to FIG. 4 to FIG. 10, according to some embodiments of the present disclosure, the rotatable flow guide device 141 is rotatable by 360°. Such a design realizes a flexible rotation of the rotatable flow guide device 141 and facilitates distributing, by the rotatable flow guide device 141, the outlet air volume from the air outlet passage 14 towards each of the front side and the bottom side of the first air outlet 11 with a greater coverage.

[0067] Referring to FIG. 4 to FIG. 10, according to some embodiments of the present disclosure, the rotatable flow guide device 141 includes an inner deflector 1411 that is rotatable. The inner deflector 1411 is configured to guide the airflow (the inner deflector 1411 guides the airflow to different directions when rotated to different angles; and reference in this regard may be made to FIG. 5 to FIG. 11 regarding guidance of the inner deflector 1411 on the airflow when the inner deflector 1411 is rotated to different positions). The inner deflector 1411 is capable of adjusting the flow direction of the airflow. In an embodiment, when the inner deflector 1411 is rotated to extend in a substantially horizontal direction, the inner deflector 1411 can guide the airflow to flow forwards. Since the airflow from the front side of the first air outlet 11 is discharged substantially forwards, most of the airflow in the air outlet passage 14 is discharged forwards from the front side of the first air outlet 11, and a small part of the airflow in the air outlet passage 14 is

discharged downwards from the bottom side of the first air outlet 11. In an embodiment, when the inner deflector 1411 is rotated to extend in a substantially vertical direction, the inner deflector 1411 can guide the airflow to flow downwards. Since the airflow from the front side of the first air outlet 11 is discharged substantially downwards, most of the airflow in the air outlet passage 14 is discharged downwards from the bottom side of the first air outlet 11, and a small part of the airflow in the air outlet passage 14 is discharged forwards from the front side of the first air outlet 11. The inner deflector 1411 has a rotation axis located at or close to a middle thereof. Therefore, the inner deflector 1411 occupies a small space when rotated, which facilitates arranging other components inside the air-conditioning indoor unit 100.

[0068] Referring to FIG. 4 to FIG. 10, according to some embodiments of the present disclosure, the rotatable flow guide device 141 includes an inner deflector 1411 that is rotatable, and a louver 1412 disposed on the inner deflector 1411. Here, the inner deflector 1411 is connected to a link. The link passes through the louver 1412, and is movable in the leftward-rightward direction to drive the louver 1412 to sway in the leftward-rightward direction. The inner deflector 1411 can guide the airflow. Rotating the inner deflector 1411 may adjust the flow direction of the airflow in the upward-downward direction, and the louver 1412 may adjust the flow direction of the airflow in the leftward-rightward direction. Therefore, by designing the rotatable flow guide device 141 to include the rotatable inner deflector 1411 and the louver 1412 disposed on the inner deflector 1411, the rotatable flow guide device 141 can guide the airflow in several directions. In addition, by integrating the louver 1412 on the inner deflector 1411, it is possible to decrease an occupation space and provide the whole machine with a compact structure.

[0069] Referring to FIG. 4 to FIG. 10, according to some embodiments of the present disclosure, when the air-conditioning indoor unit 100 is in an OFF state, the rotatable flow guide device 141 can close an air outlet end of the air outlet passage 14. Such a design prevents dust or foreign objects from passing through the breezeless member 2 and entering the air outlet passage 14 through the air outlet end of the air outlet passage 14 when the air-conditioning indoor unit 100 is turned off.

[0070] According to some embodiments of the present disclosure, the rotatable flow guide device 141 is driven to rotate by a second drive motor disposed on the surface frame 1 or the base of the air-conditioning indoor unit 100. Such a manner is convenient for mounting and fixation of the second drive motor and stabilizes the mounting of the second drive motor.

[0071] Referring to FIG. 1, according to an embodiment in a second aspect of the present disclosure, an air conditioner includes the air-conditioning indoor unit 100 according to any of the embodiments in the first aspect of the present disclosure. In an embodiment, the air conditioner is a split wall-mounted air conditioner, and the

air-conditioning indoor unit 100 is a split wall-mounted air-conditioning indoor unit; or the air conditioner is a split floor-standing air conditioner, and the air-conditioning indoor unit 100 is a split floor-standing air-conditioning indoor unit.

[0072] For the air conditioner provided by the present disclosure, the above-mentioned air-conditioning indoor unit 100 may be adopted to allow the cold air to be blown gently without being blown directly across the human body, thereby realizing the breezeless air blowing mode. In addition, the air-conditioning indoor unit has a large cooling capacity in the breezeless mode, which solves a problem of an insufficient outlet air volume occurred when the air conditioner offers a mild air sense. Moreover, diversified air blowing modes of the air conditioner improve user experience.

[0073] In the description of this specification, descriptions with reference to the terms "an embodiment", "some embodiments", "illustrative embodiments", "an example", "a specific example", "some examples", etc., mean that specific features, structure, materials, or characteristics described in conjunction with the embodiment or example are included in at least one embodiment or example of the present disclosure. In this specification, the schematic representations of the above terms do not necessarily refer to the same embodiment or example. Moreover, the described specific features, structures, materials or characteristics may be combined in any one or more embodiments or examples in a suitable manner.

[0074] Although the embodiments of the present disclosure have been illustrated and described, it is conceivable for those of ordinary skill in the art that various changes, modifications, replacements, and variations can be made to these embodiments without departing from the principles and spirit of the present disclosure. The scope of the present disclosure shall be defined by the claims as appended and their equivalents.

Claims

1. An air-conditioning indoor unit comprising:

a surface frame comprising an air inlet and a first air outlet, wherein the first air outlet is provided on a front lower part of the surface frame, wherein the first air outlet penetrates forwardly a front part of the surface frame and downwardly a bottom of the surface frame;
a breezeless member being configured to scatter air and arranged at a front side of the surface frame in a manner that the breezeless member is movable between a first position and a second position;
an outer deflector movably disposed at the first air outlet, wherein the outer deflector is configured to open and close a bottom side of the first air outlet;

a heat exchanger disposed within the surface frame; and
a fan disposed within the surface frame, wherein:

the breezeless member opens a front side of the first air outlet when the breezeless member is at the first position, and
the breezeless member closes the front side of the first air outlet when the breezeless member is at the second position.

2. The air-conditioning indoor unit according to claim 1, wherein:

the surface frame further comprises a second air outlet, and
the second air outlet is provided on at least one of a left end or a right end of the surface frame.

3. The air-conditioning indoor unit according to claim 1 or 2, wherein:

a panel is disposed at the front side of the surface frame,
a receiving chamber is defined between the panel and the surface frame, and
the breezeless member is received within the receiving chamber when the breezeless member is at the first position.

4. The air-conditioning indoor unit according to any one of claims 1 to 3, wherein:

when the air-conditioning indoor unit is in an OFF state, the bottom side of the first air outlet is closed by the outer deflector, and the front side of the first air outlet is closed by the breezeless member, and the breezeless member abuts the outer deflector to form an abutting line which is located at the front side of the first air outlet.

5. The air-conditioning indoor unit according to any one of claims 1 to 4, further comprising a first operation mode group,

wherein when the air-conditioning indoor unit is in the first operation mode group, the front side of the first air outlet is opened by the breezeless member, and the bottom side of the first air outlet is at least partially opened by the outer deflector.

6. The air-conditioning indoor unit according to claim 5, wherein:

the first operation mode group comprises at least one of a first operation mode or a second operation mode;
in the first operation mode, the front side of the first air outlet is opened by the breezeless mem-

- ber, and the bottom side of the first air outlet is partially opened by the outer deflector; and in the second operation mode, the front side of the first air outlet is opened by the breezeless member, the bottom side of the first air outlet is opened by the outer deflector, and air blown from the first air outlet is guided downwardly by moving and positioning the outer deflector at the front side of the first air outlet.
7. The air-conditioning indoor unit according to any one of claims 1 to 4, further comprising a second operation mode group, wherein when the air-conditioning indoor unit is in the second operation mode group, the front side of the first air outlet is closed by the breezeless member, and the bottom side of the first air outlet is at least partially closed by the outer deflector.
8. The air-conditioning indoor unit according to claim 7, wherein:
- the second operation mode group comprises at least one of a third operation mode or a fourth operation mode;
- in the third operation mode, the front side of the first air outlet is closed by the breezeless member, and the bottom side of the first air outlet is closed by the outer deflector; and
- in the fourth operation mode, the front side of the first air outlet is closed by the breezeless member, and the outer deflector has one end abutting the breezeless member and another end spaced apart from the bottom of the surface frame to partially open the bottom side of the first air outlet.
9. The air-conditioning indoor unit according to any one of claims 1 to 8, wherein the outer deflector is rotatably disposed at the first air outlet.
10. The air-conditioning indoor unit according to any one of claims 1 to 8, wherein the outer deflector is disposed on the bottom side of the first air outlet and configured to move forwardly and backwardly.
11. The air-conditioning indoor unit according to claim 10, further comprising a drive mechanism for driving the outer deflector to move forwardly and backwardly, the drive mechanism comprising:
- a motor;
- a gear disposed on an output shaft of the motor; and
- a rack disposed on the outer deflector and extending in a forward-backward direction, the gear being adapted to be engaged with the rack.
12. The air-conditioning indoor unit according to claim 11, further comprising an accommodation chamber provided on a lower end of the surface frame, wherein the motor and the gear are disposed within the accommodation chamber, and wherein the rack is at least partially accommodated within the accommodation chamber.
13. The air-conditioning indoor unit according to claim 12, wherein when the bottom side of the first air outlet is opened by the outer deflector, the rack is entirely accommodated within the accommodation chamber, and the outer deflector is at least partially accommodated within the accommodation chamber.
14. The air-conditioning indoor unit according to any one of claims 1 to 13, wherein:
- the breezeless member comprises: an air-scattering plate; and an air-scattering device disposed on the air-scattering plate and located on an inner side of the air-scattering plate, the air-scattering plate comprises a first air-scattering structure, and
- the air-scattering device comprises: a mounting plate having a plurality of first ventilation holes and connected to the air-scattering plate; and a first air-scattering mechanism disposed within the plurality of first ventilation holes and comprising at least one of a first stationary blade or a first movable blade, the first stationary blade being opposite to the first movable blade.
15. The air-conditioning indoor unit according to any one of claims 1 to 14, wherein the outer deflector comprises a second air-scattering structure.
16. The air-conditioning indoor unit according to claim 15, wherein:
- the second air-scattering structure comprises a plurality of air-scattering holes formed on the outer deflector; or
- the outer deflector is formed in a grid form having a hollow structure to serve as the second air-scattering structure; or
- the second air-scattering structure comprises a plurality of second ventilation holes formed on the outer deflector and a plurality of second air-scattering mechanisms respectively disposed in the plurality of second ventilation holes, the second air-scattering mechanisms comprising at least one of a second stationary blade or a second movable blade, the second stationary blade being opposite to the second movable blade.
17. The air-conditioning indoor unit according to any one of claims 1 to 16, wherein a first drive motor for driving

the outer deflector is disposed on the surface frame or on a base of the air-conditioning indoor unit.

18. The air-conditioning indoor unit according to any one of claims 1 to 17, wherein: 5
- the surface frame comprises an air outlet passage in communication with the first air outlet; wherein the air outlet passage comprises a rotatable flow guide device provided therein, the rotatable flow guide device being configured to divide air out of the air outlet passage into a volume of air blown towards the front side of the first air outlet and a volume of air blown towards the bottom side of the first air outlet. 10 15
19. The air-conditioning indoor unit according to claim 18, wherein the rotatable flow guide device is rotatable by 360°. 20
20. The air-conditioning indoor unit according to claim 18, wherein the rotatable flow guide device comprises an inner deflector that is rotatable, the inner deflector having a rotation axis located at or close to a middle part of the inner deflector. 25
21. The air-conditioning indoor unit according to claim 18, wherein the rotatable flow guide device comprises an inner deflector that is rotatable, and a louver disposed on the inner deflector. 30
22. The air-conditioning indoor unit according to claim 18, wherein when the air-conditioning indoor unit is in an OFF state, an air outlet end of the air outlet passage is closed by the rotatable flow guide device. 35
23. The air-conditioning indoor unit according to claim 18, wherein a second drive motor is disposed on the surface frame or on the base of the air-conditioning indoor unit for driving the rotatable flow guide device to rotate. 40
24. An air conditioner, comprising an air-conditioning indoor unit according to any one of claims 1 to 23. 45

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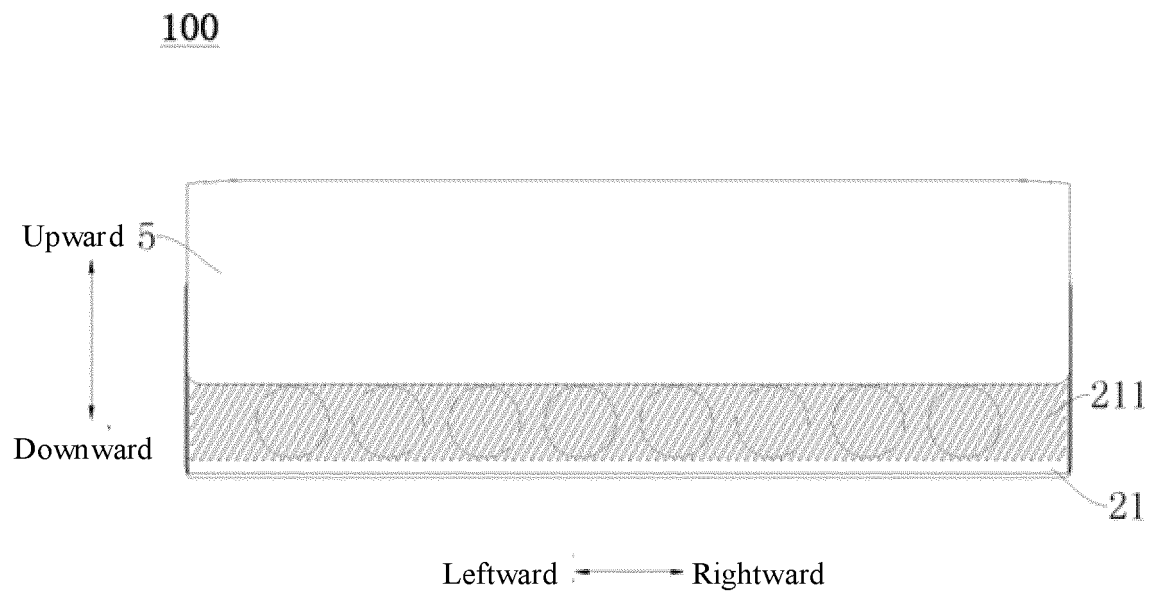


FIG. 1

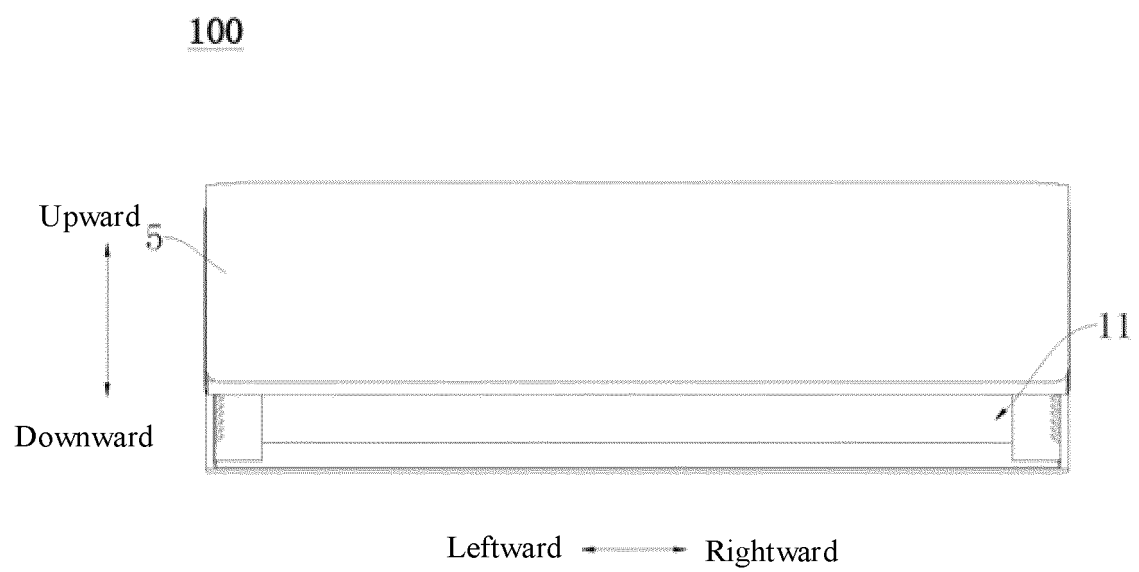


FIG. 2

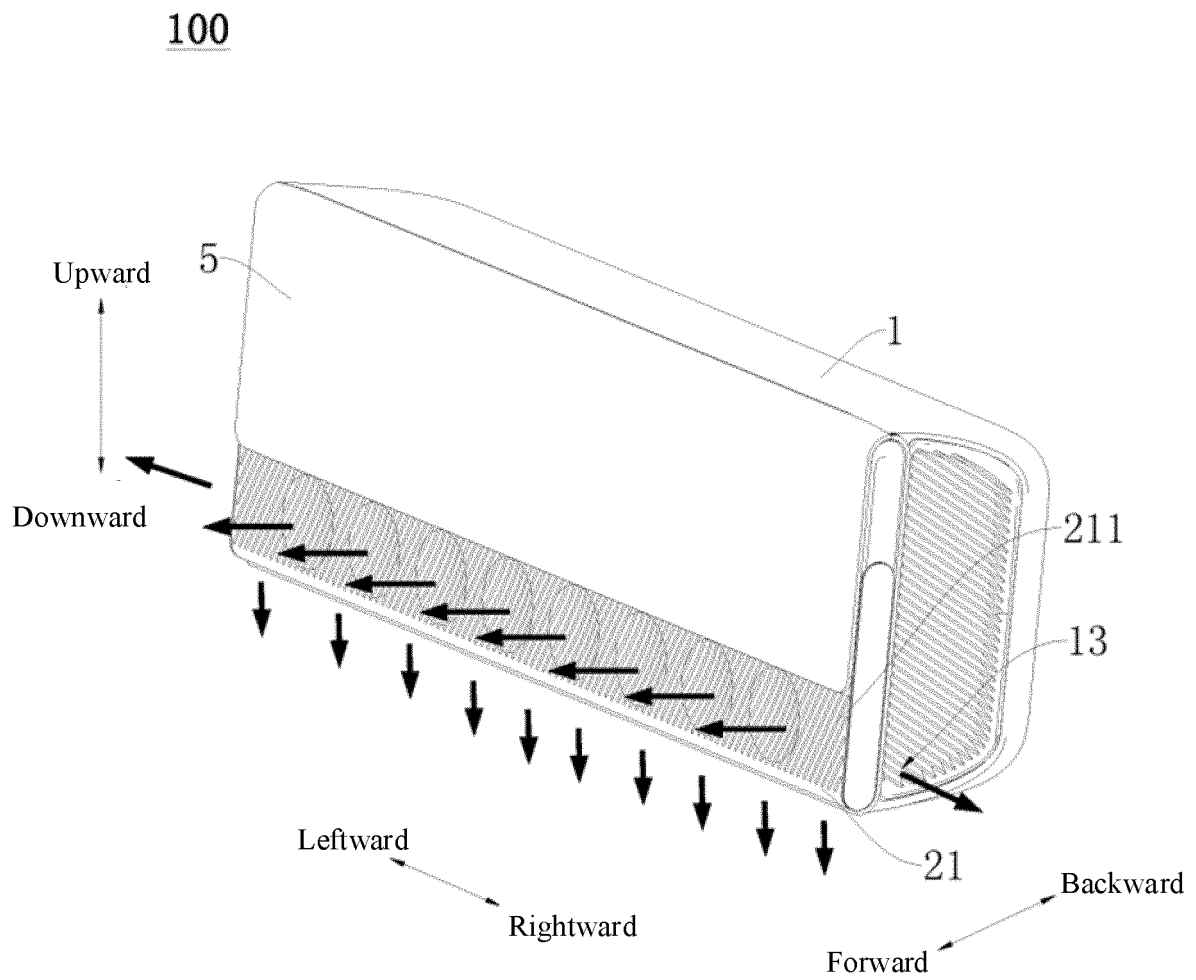


FIG. 3

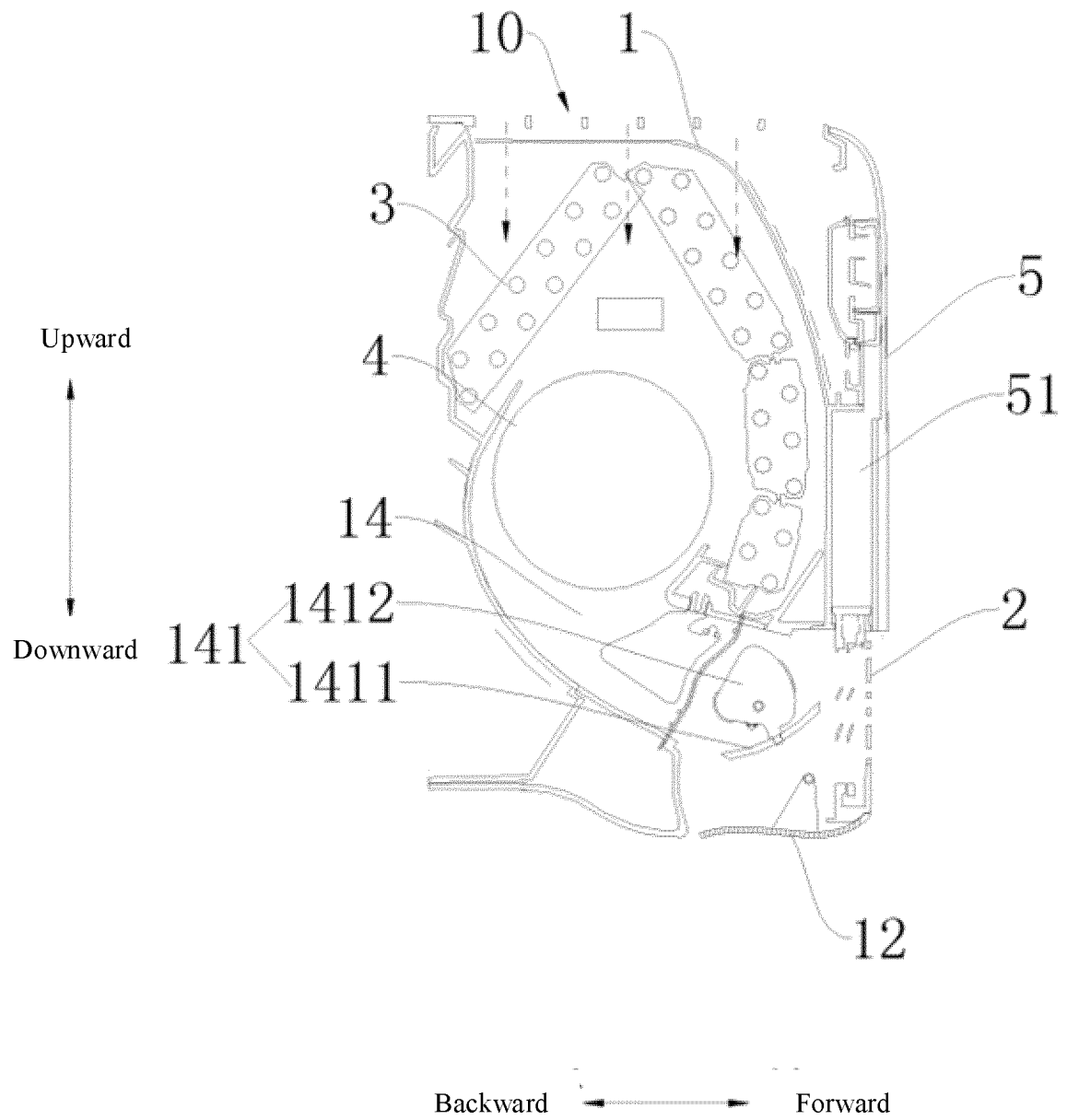


FIG. 4

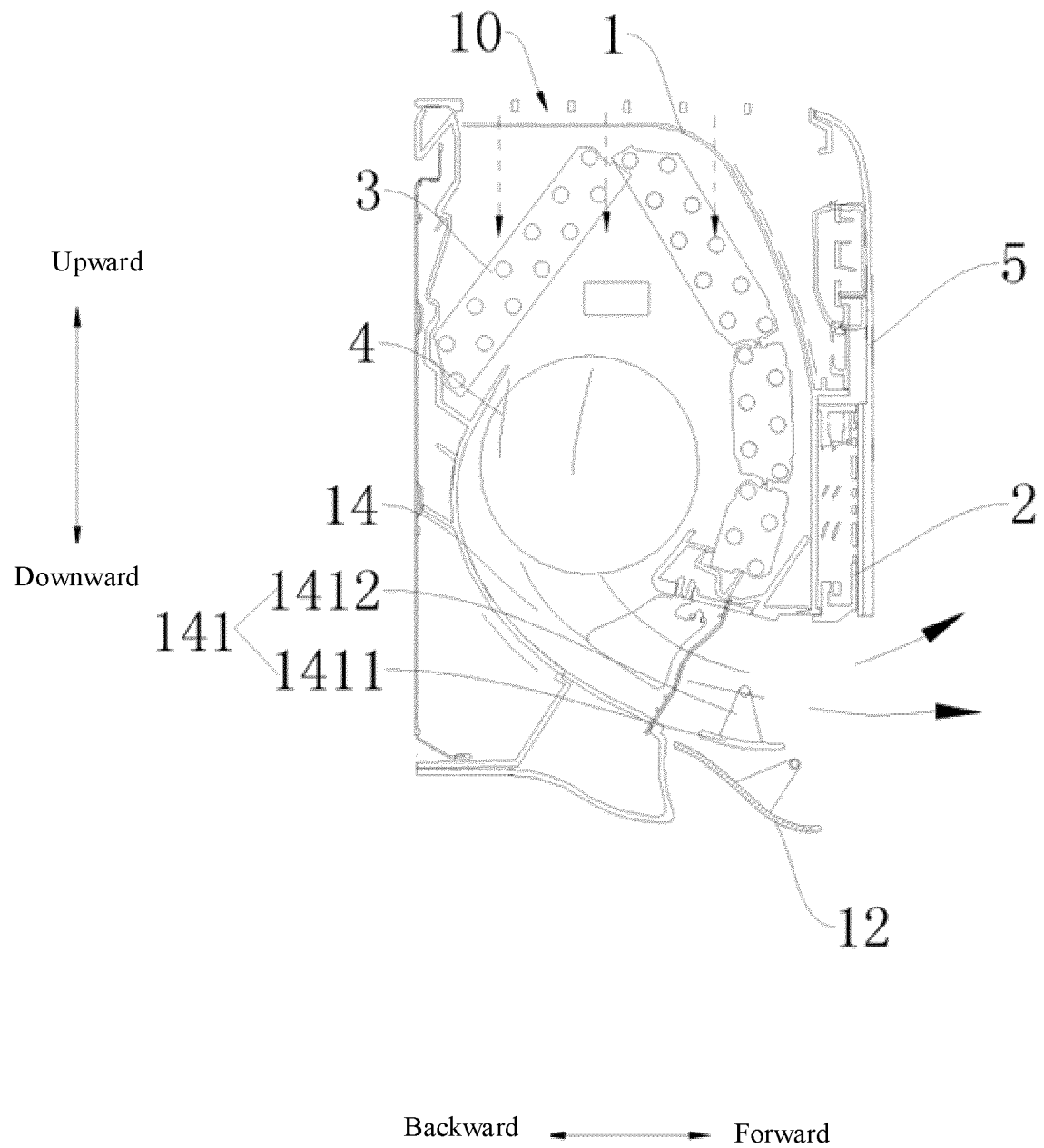


FIG. 5

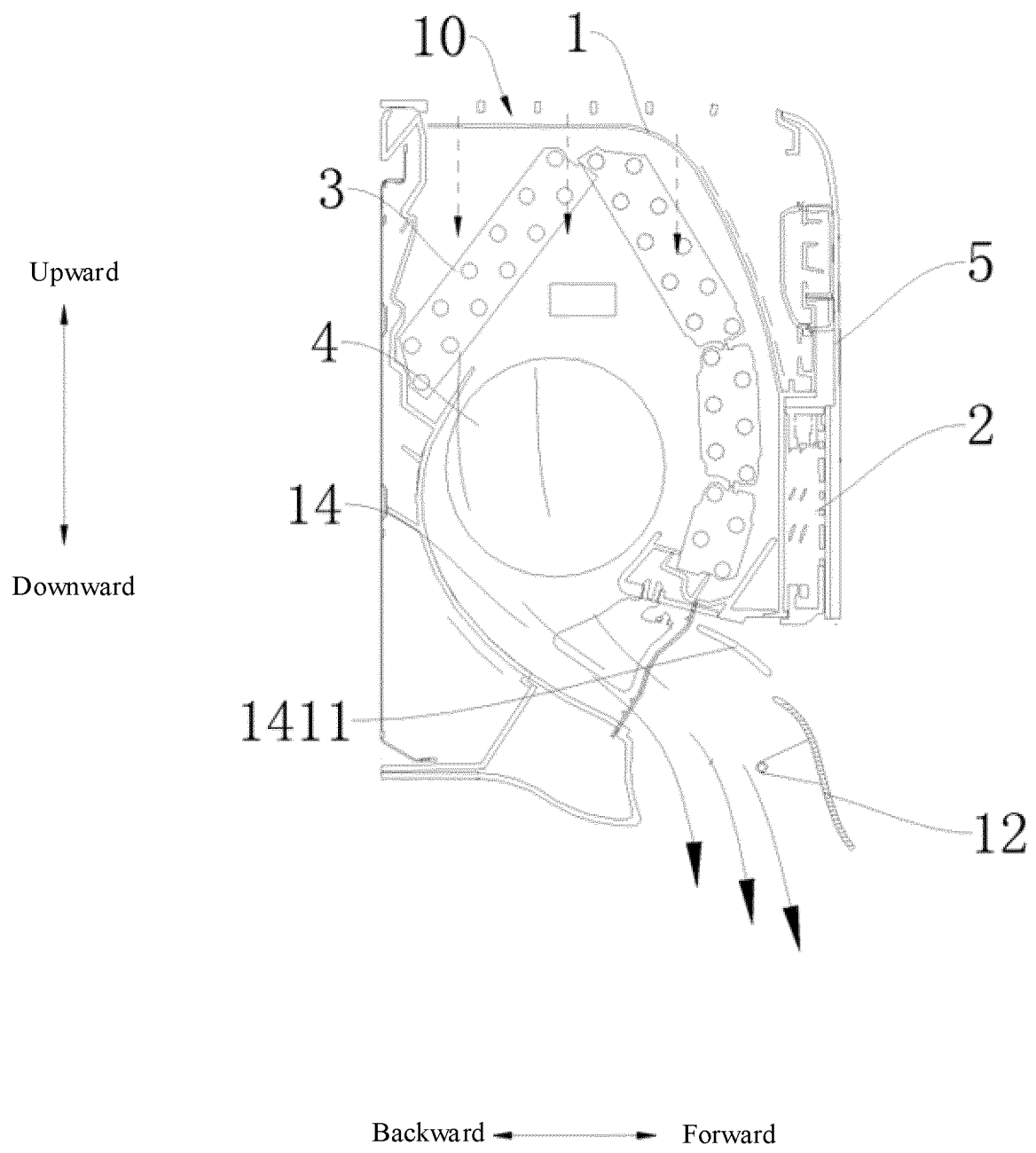


FIG. 6

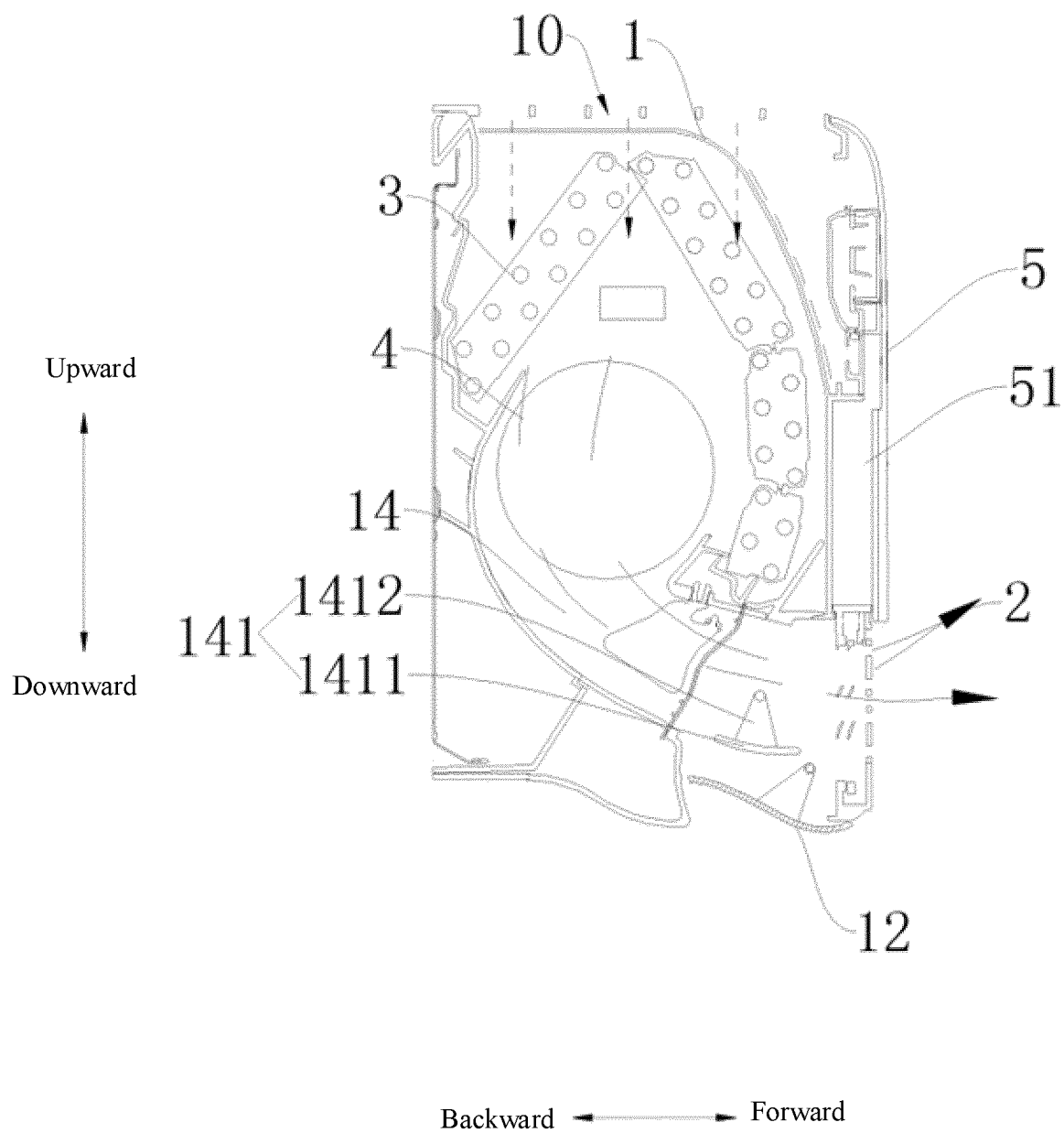


FIG. 7

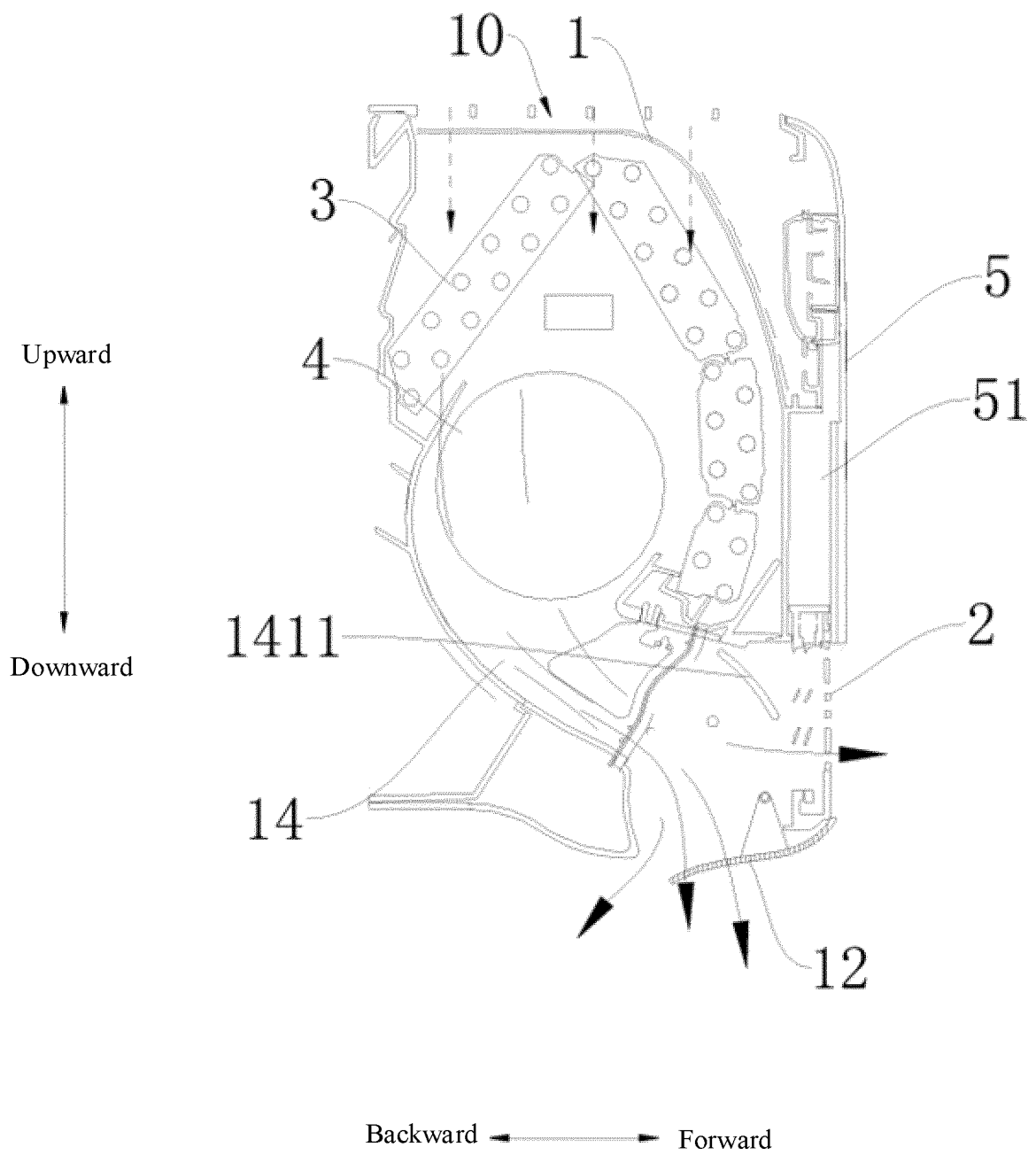
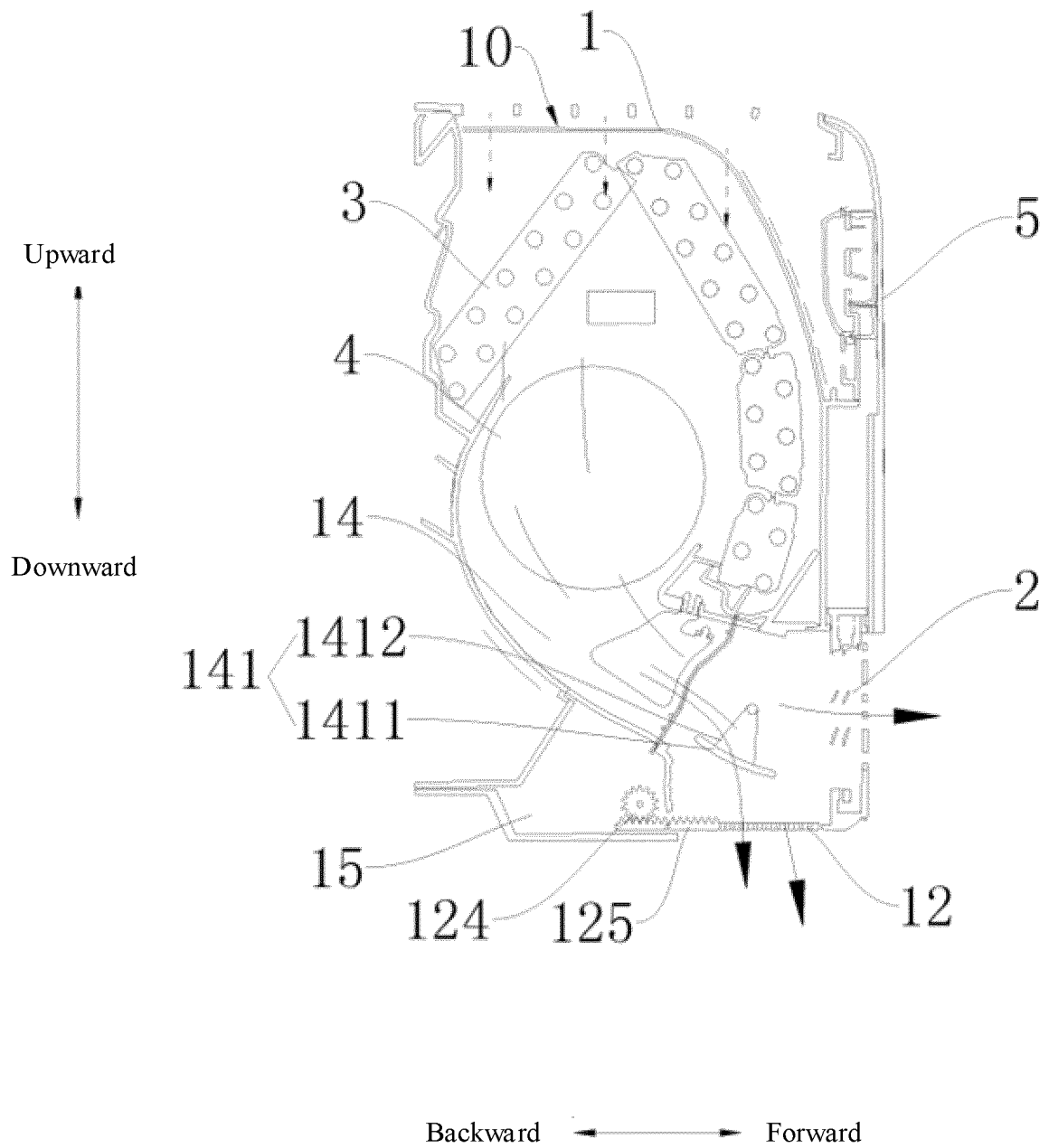


FIG. 8



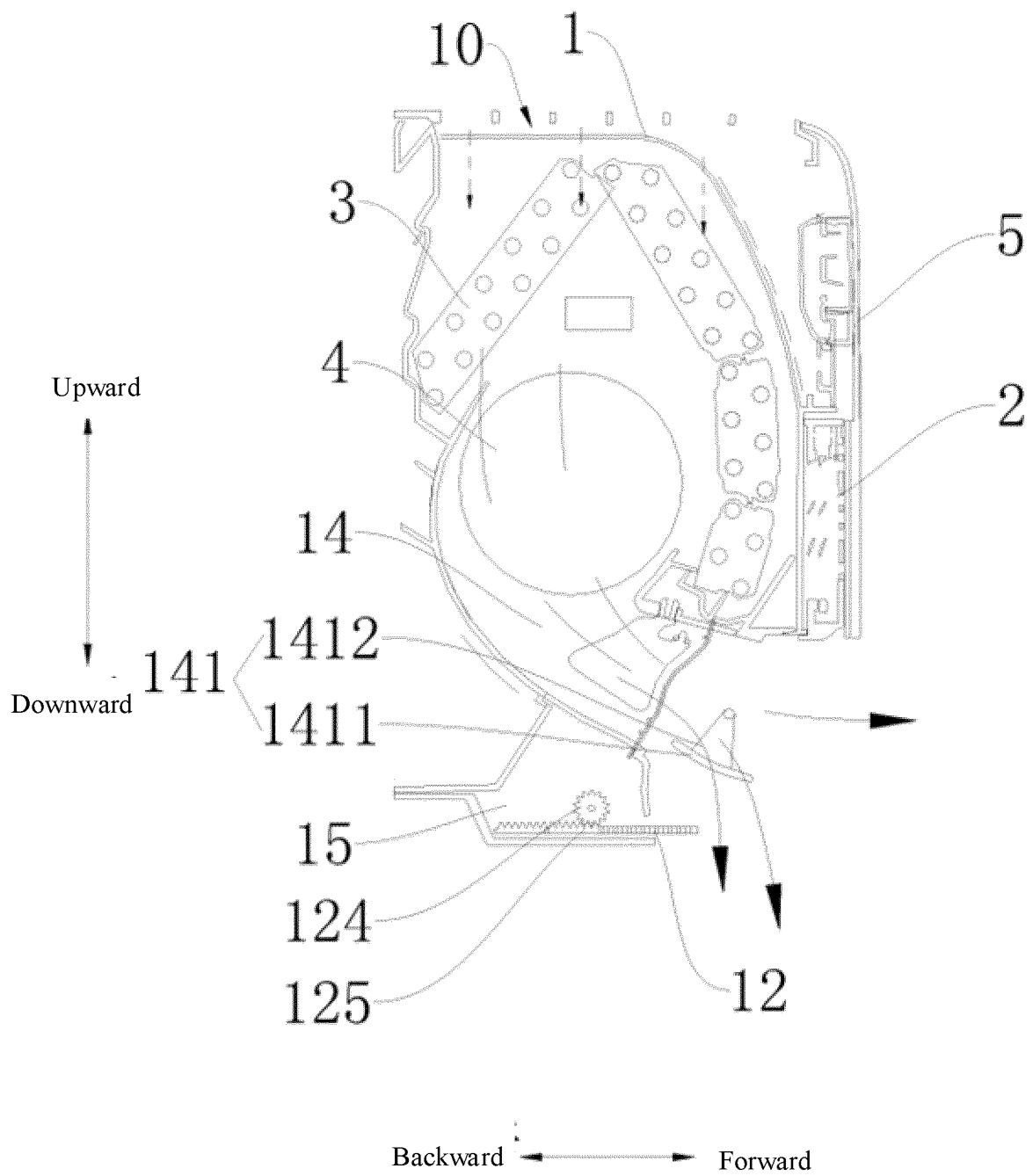


FIG. 10

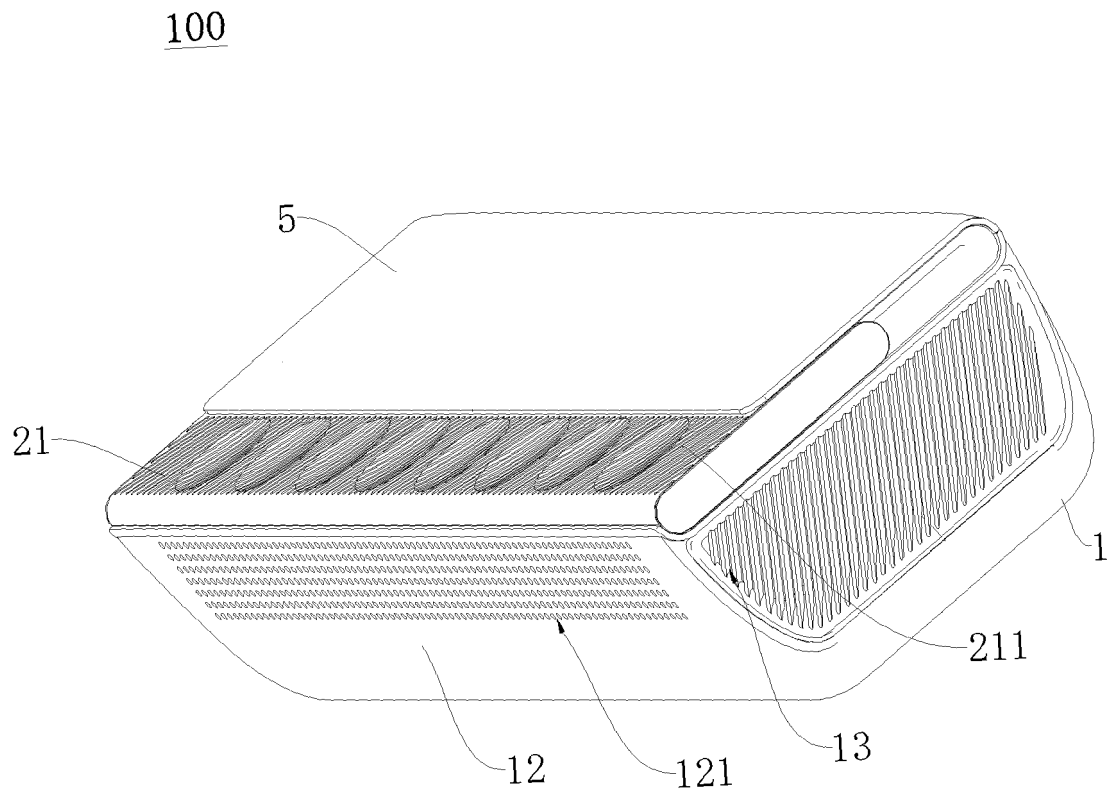


FIG. 11

100

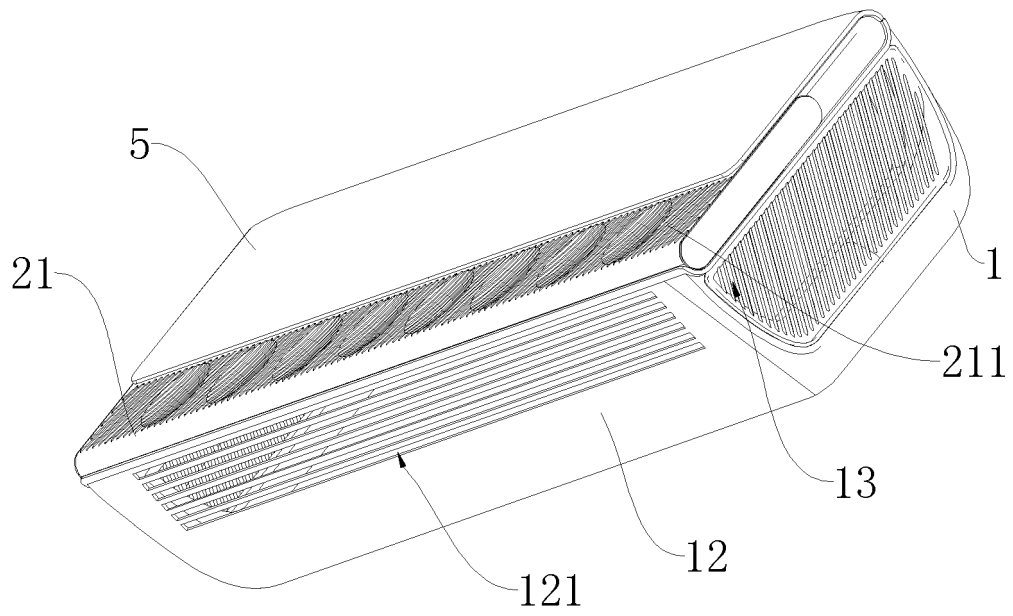


FIG. 12

100

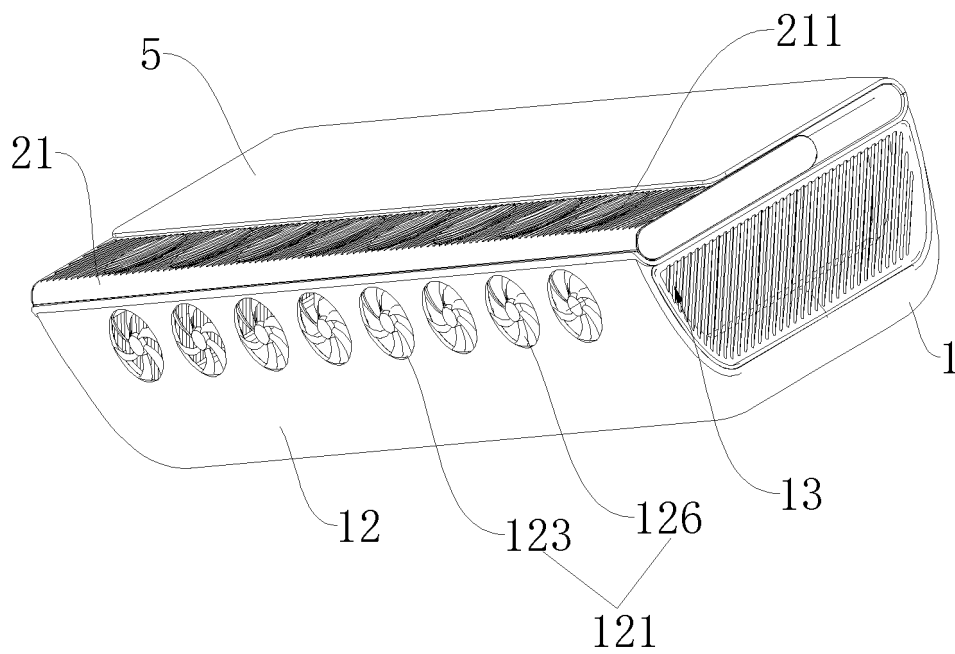


FIG. 13

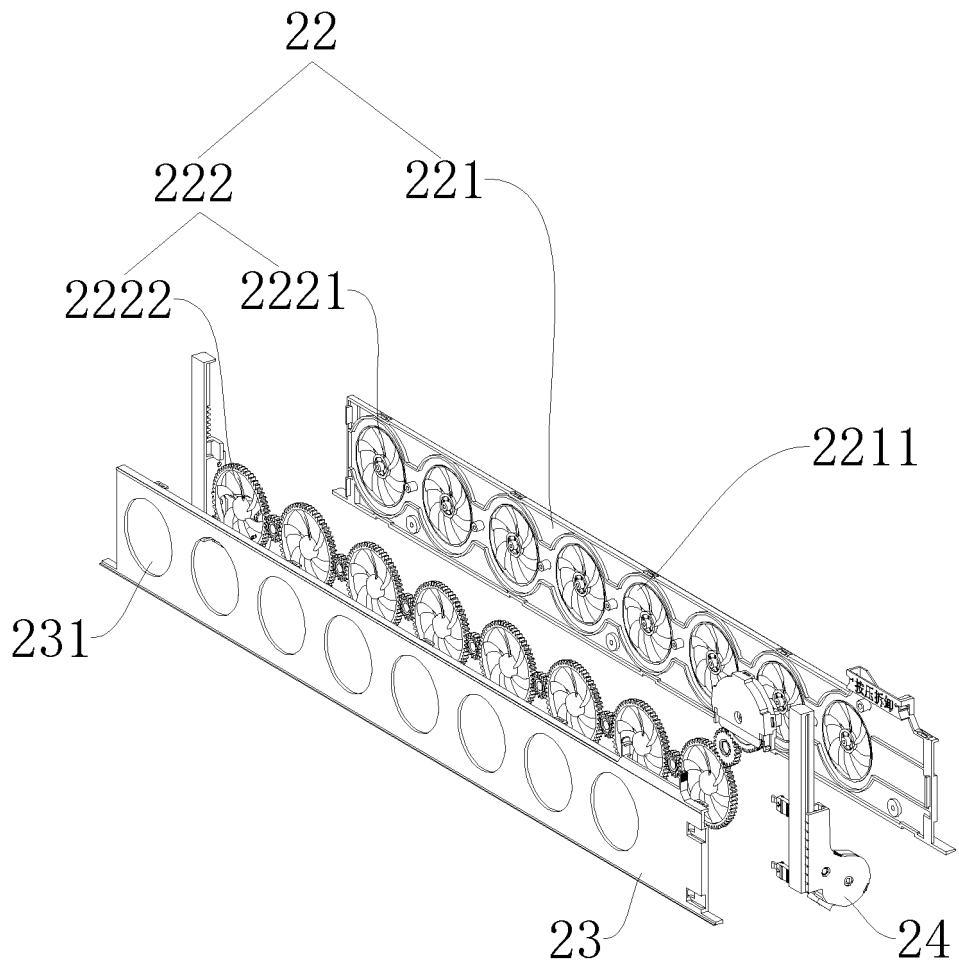


FIG. 14

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2020/128979

A. CLASSIFICATION OF SUBJECT MATTER

F24F 1/0014(2019.01)i; F24F 1/0033(2019.01)i; F24F 1/0063(2019.01)i; F24F 13/20(2006.01)i; F24F 13/10(2006.01)i; F24F 13/15(2006.01)i

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

F24F

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

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

CNABS, CNKI, DWPI, VEN: 空调, 室内机, 出风口, 前部, 底部, 散风, 无风感部件, 移动, 导风板, 打开, 关闭, air conditioner, indoor unit, air outlet, front, bottom, dispersed wind, windless components, move, air deflector, open, close

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CN 110701683 A (GUANGDONG MEDIA REFRIGERATION EQUIPMENT CO., LTD. et al.) 17 January 2020 (2020-01-17) description paragraphs [0075]-[0112], figures 1-15	1-24
Y	CN 109974089 A (GUANGDONG MEDIA REFRIGERATION EQUIPMENT CO., LTD. et al.) 05 July 2019 (2019-07-05) description paragraphs [0041]-[0065], figures 1-7	1-24
Y	CN 209877127 U (QINGDAO HAIER AIR CONDITIONER GENERAL CO., LTD. et al.) 31 December 2019 (2019-12-31) description paragraphs [0042]-[0053], figures 1-3	10-13
PX	CN 111140922 A (GUANGDONG MEDIA REFRIGERATION EQUIPMENT CO., LTD. et al.) 12 May 2020 (2020-05-12) claims 1-24	1-24
PX	CN 211575269 U (GUANGDONG MEDIA REFRIGERATION EQUIPMENT CO., LTD. et al.) 25 September 2020 (2020-09-25) claims 1-24	1-24

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Date of the actual completion of the international search

11 January 2021

Date of mailing of the international search report

28 January 2021

Name and mailing address of the ISA/CN

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INTERNATIONAL SEARCH REPORT

International application No. PCT/CN2020/128979

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 207936295 U (QINGDAO HAIER AIR CONDITIONER GENERAL CO., LTD.) 02 October 2018 (2018-10-02) entire document	1-24
A	CN 108180552 A (QINGDAO HAIER AIR CONDITIONER GENERAL CO., LTD.) 19 June 2018 (2018-06-19) entire document	1-24
A	CN 108087982 A (ANHUI JINHONGSHENG ELECTRIC CO., LTD.) 29 May 2018 (2018-05-29) entire document	1-24

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2020/128979

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 110701683 A	17 January 2020	None	
CN 109974089 A	05 July 2019	None	
CN 209877127 U	31 December 2019	None	
CN 111140922 A	12 May 2020	None	
CN 211575269 U	25 September 2020	None	
CN 207936295 U	02 October 2018	None	
CN 108180552 A	19 June 2018	CN 108180552 B	29 May 2020
CN 108087982 A	29 May 2018	None	

Form PCT/ISA/210 (patent family annex) (January 2015)

REFERENCES CITED IN THE DESCRIPTION

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