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(54) **CABINET AIR CONDITIONER AND CONTROL METHOD**

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Description

Technical Field

[0001] The present application relates to a technical field of air conditioner equipment, and in particular to a cabinet air conditioner and a control method.

Background

[0002] At present, vertical cabinet air conditioners mainly include square upper air outlet cabinets, circular long air outlet cabinets, and distributed air supply cabinets that simultaneously discharge air up and down. Due to characteristics of cold and hot air that cold air sinks and hot air floats, a problem of heat layering of indoor air can be caused during refrigerating and heating air supply processes, and since an air return position of a air conditioner cabinet is not changed, the heat distribution will not change. An air conditioner exchanges heat according to the indoor temperature, a problem of heat layering of the distributed air supply cabinet is relatively small, a difference between upper and lower temperatures is relatively small, but a problem of low energy utilization efficiency caused by the characteristics of cold and hot air cannot be overcome yet.

[0003] The document CN209013431U discloses an air conditioner shell, the air conditioner shell comprises an outer shell, the outer shell comprises a front panel and a rear panel, the rear panel is provided with a rear air inlet, a draught fan is arranged on the front panel, a partition plate in the vertical direction is arranged in the outer shell, and the partition plate divides the outer shell into two parts. The partition plate is provided with a partition plate air inlet hole, and the partition plate is provided with an upper notch and a lower notch in the twosides of the partition plate air inlet hole respectively. The upper notch and the lower notch are each provided with a baffle structure, the baffle structures block an air outlet channel of a draughtfan or close the notches, and when the rear air inlet is closed, the upper notch is closed by the baffle structures, and the lower notch is opened. Or the lower notch is closed by the baffle structure, and the upper notch is opened. According to the air conditioner shell, the utilization area of the heat exchanger during single-side air outlet is fully increased, the air inlet area of the air conditioner during single-side air outlet is increased, the air outlet direction can be freely selected, and the utilization rate of the heat exchanger is guaranteed.

Summary

[0004] The main purpose of the present invention is to provide an air conditioner according to claim 1 and a control method according to claim 12, so as to solve a problem of low refrigerating capacity utilization rate in the prior art.

[0005] In order to achieve the above purpose, according to one aspect of the present application, a air conditioner cabinet is provided, including: a housing, wherein the housing is provided with an upper air port and a lower air port; a mixed flow fan, wherein the mixed flow fan is disposed in the housing; and a regulating mechanism, wherein the regulating mechanism is disposed in the housing, the regulating mechanism has a necking position and a flaring position, and when the regulating mechanism is located at the necking position, the mixed flow fan sucks an external airflow into the housing from the upper air port, and then discharges the external airflow from the housing by the lower air port, wherein the air conditioner cabinet includes: a heat exchanger, wherein the heat exchanger is disposed in the housing and is located between the upper air port and the lower air port, the regulating mechanism is located between the mixed flow fan and the heat exchanger, the regulating mechanism has the necking position where the regulating mechanism contracts toward an axis of the housing, the regulating mechanism has the flaring position where the regulating mechanism gradually expands away from the axis of the housing, and when the regulating mechanism is located at the necking position, the mixed flow fan sucks the external airflow into the housing from the upper air port, so as to perform heat exchange with the heat exchanger, and then discharges the external airflow from the housing by the lower air port, wherein, when the regulating mechanism is located at the flaring position, the mixed flow fan sucks the external airflow into the housing from the lower air port, so as to perform heat exchange with the heat exchanger, and then discharges the external airflow from the housing by the upper air port.

[0006] In some embodiments, the air conditioner cabinet includes an air duct, the air duct includes a first air duct and a second air duct, the first air duct is disposed in the housing, a first end of the first air duct is communicated with the lower air port, a second end of the first air duct is connected with the regulating mechanism, the regulating mechanism and the first air duct are enclosed to form the second air duct, and the mixed flow fan is disposed in the first air duct.

[0007] In some embodiments, the air duct further includes a third air duct and a fourth air duct, the air conditioner cabinet includes a supporting portion, wherein the supporting portion is connected with an inner wall of the housing, the regulating mechanism is located below the supporting portion, an overflow channel is disposed on the supporting portion, and the heat exchanger is connected with the supporting portion.

[0008] In some embodiments, the heat exchanger is of a hollow structure, the hollow structure is communicated with the second air duct through the overflow channel, so as to form the third air duct, an outer surface of the heat exchanger is disposed at a distance from the housing, so as to form the fourth air duct, and the fourth air duct is communicated with the upper air port and the third air duct.

[0009] In some embodiments, the supporting portion

includes a water pan, wherein the water pan is connected with the housing, the overflow channel is formed on the water pan, and the water pan is used for collecting condensed water generated by the heat exchanger.

[0010] In some embodiments, the heat exchanger is of a barrel-shaped structure with an end opening at one end, an open end of the heat exchanger is connected with the water pan, an inner diameter of the open end of the heat exchanger is greater than an inner diameter of the overflow channel, and an airflow in the third air duct exchanges heat through a side wall of the heat exchanger and then flows into the fourth air duct, or, an airflow in the fourth air duct exchanges heat through a side wall of the heat exchanger and then flows into the third air duct.

[0011] In some embodiments, the regulating mechanism includes: a first regulating mechanism, wherein a first end of the first regulating mechanism is movably connected with the second end of the first air duct, a second end of the first regulating mechanism is disposed away from the first air duct, the second end of the first regulating mechanism has the necking position close to the axis of the housing, and the second end of the first regulating mechanism has the flaring position away from the axis of the housing; and a second regulating mechanism, wherein a first end of the second regulating mechanism is movably connected with the water pan, a second end of the second regulating mechanism has the necking position close to the axis of the housing, and the second end of the second regulating mechanism has the flaring position away from the axis of the housing, when the first regulating mechanism and the second regulating mechanism are both located at the necking positions, the first end of the first regulating mechanism is in contact with the second end of the second regulating mechanism, and the first regulating mechanism and the second regulating mechanism are enclosed to form a sealed second air duct.

[0012] In some embodiments, when the first regulating mechanism and the second regulating mechanism are both located at the flaring positions, the first regulating mechanism is enclosed with at least one of the second regulating mechanism, the housing, the supporting portion and the water pan, so as to form the second air duct.

[0013] In some embodiments, when the first regulating mechanism and the second regulating mechanism are both located at the necking positions, a cross sectional area of the second air duct is configured to gradually decrease along a direction away from the mixed flow fan.

[0014] In some embodiments, when the first regulating mechanism and the second regulating mechanism are both located at the flaring positions, a cross sectional area of the air duct structure enclosed by the second regulating mechanism is configured to gradually increase along a direction toward the mixed flow fan.

[0015] In some embodiments, the first regulating mechanism includes: a plurality of a first arc-shaped regulating plate, a first end of each of the plurality of first arc-shaped regulating plate is hinged with an end side wall of the first air duct, a second end of each of the plurality of first arc-shaped regulating plate is disposed far away from the first air duct, the plurality of first arc-shaped regulating plates are disposed along a circumferential direction of the first air duct, and when each of the plurality of first arc-shaped regulating plates is located at the necking position, the plurality of first arc-shaped regulating plates are enclosed to form an annular air duct structure.

[0016] In some embodiments, the second end of the first arc-shaped regulating plate is provided with a folded edge, and the folded edge is bent toward a side of the housing.

[0017] In some embodiments, the second regulating mechanism includes: a plurality of second arc-shaped regulating plates, a first end of each of the plurality of second arc-shaped regulating plates is hinged with a bottom of the water pan, a second end of each of the plurality of second arc-shaped regulating plate is disposed to be able to rotate around a hinge point of the first end of the second arc-shaped regulating plate and the water pan, the plurality of second arc-shaped regulating plates are disposed along a circumferential direction of the overflow channel, and when each of the plurality of second arc-shaped regulating plate located at the necking positions, the plurality of second arc-shaped regulating plates are enclosed to form an annular air duct structure.

[0018] In some embodiments, the supporting portion further includes: an annular supporting platform, wherein the annular supporting platform is connected with an inner wall of the housing, the water pan is connected with the annular supporting platform and is located above the annular supporting platform, and when the second arc-shaped regulating plate is located at the flaring position, the second end of the second arc-shaped regulating plate is in sealing connection with an inner circumferential surface of the annular supporting platform.

[0019] In some embodiments, a bottom of the annular supporting platform is provided with an inclined plane, and when the second arc-shaped regulating plate is located at the flaring position, a lower surface of the second arc-shaped regulating plate is parallel to the inclined plane.

[0020] In some embodiments, the heat exchanger is of a cylindrical structure, an axis of the heat exchanger is disposed along a vertical direction, and an end of the heat exchanger close to the upper air port is provided with a top plate.

[0021] According to another aspect of the present application, a method for controlling an air conditioner cabinet is provided. The method is used for controlling the above-mentioned air conditioner cabinet, and the method includes following steps: when a heating mode is selected by a controller of the air conditioner cabinet, the regulating mechanism is located at the necking position, the mixed flow fan sucks the external airflow into the housing from the upper air port, so as to perform heat exchange with the heat exchanger, and then discharges the external airflow from the housing through the lower

air port; and when a refrigeration mode is selected by the controller, the regulating mechanism is located at the flaring position, the mixed flow fan sucks the external airflow into the housing from the lower air port, so as to perform heat exchange with the heat exchanger, and then discharges the external airflow from the housing through the upper air port.

[0022] In some embodiments, the air conditioner cabinet further includes an air supply mode, when the air supply mode is selected by the controller, the regulating mechanism is located at the necking position, the mixed flow fan sucks the external airflow into the housing from the upper air port, and then discharges the external airflow from the housing through the lower air port, or, when the air supply mode is selected by the controller, the regulating mechanism is located at the flaring position, the mixed flow fan sucks the external airflow into the housing from the lower air port, and then discharges the external airflow from the housing through the upper air port, wherein the heat exchanger is in a non-working state in the air supply mode.

[0023] According to the technical solution of the present application, by disposing the regulating mechanism in the housing, and controlling the regulating mechanism to be located at the flaring position or the necking position, the air conditioner cabinet with the mixed flow fan can realize a mode of air inflow at the upper air port and air outflow at the lower air port, or, the air conditioner cabinet realizes a mode of air outflow at the upper air port and air inflow at the lower air port. Especially when the air conditioner cabinet is in the refrigeration mode, the mode of air outflow at the upper air port and air inflow at the lower air port is utilized, and when the air conditioner cabinet is in the heating mode, the mode of air inflow at the upper air port and air outflow at the lower air port is utilized, the problem of indoor heat layering can be effectively avoided, the temperature difference of the indoor temperature can be very small in the longitudinal direction, and the utilization rate of the energy generated by the air conditioner cabinet can be effectively improved.

Brief Description of the Drawings

[0024] The drawings constituting a part of the present application are used for providing a further understanding of the present invention, and the exemplary embodiments of the present application and descriptions thereof are used for explaining the present invention, but do not constitute improper limitations of the present invention, which is defined solely by the appended set of claims. In the drawings:

Fig. 1 illustrates a schematic structural diagram of an embodiment of an air conditioner cabinet according to the present application when an upper air port and a lower air port are closed;

Fig. 2 illustrates a schematic structural diagram of a first embodiment of the air conditioner cabinet according to the present application when the upper air port and the lower air port are open;

Fig. 3 illustrates a schematic structural diagram of an embodiment of the air conditioner cabinet according to the present application in the case of air inflow at the upper air port and air outflow at the lower air port;

Fig. 4 illustrates a schematic structural diagram of a second embodiment of the air conditioner cabinet according to the present application when the upper air port and the lower air port are open;

Fig. 5 illustrates a schematic structural diagram of an embodiment of the air conditioner cabinet according to the present application in the case of air outflow at the upper air port and air inflow at the lower air port;

Fig. 6 illustrates a schematic diagram of a sectional structure of an embodiment of the air conditioner cabinet according to the present application in the case of air outflow at the upper air port and air inflow at the lower air port; and

Fig. 7 illustrates a schematic diagram of a sectional structure of an embodiment of the air conditioner cabinet according to the present application in the case of air inflow at the upper air port and air outflow at the lower air port.

[0025] The above drawings include the following reference signs:

10. housing; 11. upper air port; 12. lower air port;
20. heat exchanger; 21. top plate;
30. mixed flow fan;
40. regulating mechanism; 41. first regulating mechanism; 411. first arc-shaped regulating plate; 412. folded edge;
42. second regulating mechanism; 421. second arc-shaped regulating plate;
51. first air duct; 52. second air duct; 53. third air duct; 54. fourth air duct;
60. supporting portion; 61. water pan; 62. annular supporting platform; and
70. overflow channel.

Detailed Description of the Embodiments

[0026] It should be noted that, the embodiments in the present invention and the features in the embodiments can be combined with each other if there is no conflict. Hereinafter, the present invention will be described in detail with reference to the drawings and in conjunction with the embodiments.

[0027] It should be noted that, the terms used here are only for describing specific embodiments, and are not intended to limit the exemplary embodiments according to the present application. As used herein, unless the context clearly indicates otherwise, a singular form is also intended to include a plural form. In addition, it should

also be understood that, when the terms "comprising" and/or "including" are used in this specification, they indicate the presence of features, steps, operations, devices, components, and/or combinations thereof.

[0028] It should be noted that, the terms "first" and "second" and the like in the description and the claims of the present application and the above-mentioned drawings are used for distinguishing similar objects, and are not necessarily used for describing a specific sequence or order. It should be understood that the terms used in this way can be interchanged under appropriate circumstances, so that the embodiments of the present application described herein, for example, can be implemented in an order other than those illustrated or described herein. In addition, the terms "including" and "having" and any variations thereof are intended to cover non-exclusive inclusions, for example, processes, methods, systems, products, or devices that include a series of steps or units are not necessarily limited to those clearly listed steps or units, but can include other steps or units that are not clearly listed or are inherent to these processes, methods, products, or devices.

[0029] Now, the exemplary embodiments according to the present invention will be described in more detail with reference to the drawings. However, these exemplary embodiments can be implemented in a variety of different forms, and should not be construed as being limited to the embodiments set forth herein. It should be understood that, these embodiments are provided to make the disclosure of the present application thorough and complete, and to fully convey the concept of these exemplary embodiments to those of ordinary skill in the art. In the drawings, for clarity, the thicknesses of layers and regions may be enlarged, and the same reference signs are used for denoting the same devices, and thus their descriptions will be omitted.

[0030] As shown in Fig. 1 to Fig. 7, according to a specific embodiment of the present invention, an air conditioner cabinet is provided.

[0031] In some embodiments, as shown in Fig. 1 and Fig. 7, the air conditioner cabinet includes a housing 10, a heat exchanger 20, a mixed flow fan 30 and a regulating mechanism 40. The housing 10 is provided with an upper air port 11 and a lower air port 12. The heat exchanger 20 is disposed in the housing 10 and is located between the upper air port 11 and the lower air port 12. The mixed flow fan 30 is disposed in the housing 10. The regulating mechanism 40 is disposed in the housing 10, the regulating mechanism 40 is located between the mixed flow fan 30 and the heat exchanger 20, the regulating mechanism 40 has a necking position where the regulating mechanism contracts toward the axis of the housing 10, and the regulating mechanism 40 has a flaring position where the regulating mechanism gradually expands away from the axis of the housing 10, and when the regulating mechanism 40 is located at the necking position, the mixed flow fan 30 can suck external airflow into the housing 10 from the upper air port 11, so as to perform heat exchange with the heat exchanger 20, and then discharges the external airflow from the housing 10 by the lower air port 12.

[0032] In some embodiments, by disposing the regulating mechanism in the housing, and controlling the regulating mechanism to be located at the flaring position or the necking position, the air conditioner cabinet with the mixed flow fan can realize a mode of air inflow at the upper air port and air outflow at the lower air port, or, the air conditioner cabinet realizes a mode of air outflow at the upper air port and air inflow at the lower air port. Especially when the air conditioner cabinet is in a refrigeration mode, the mode of air outflow at the upper air port and air inflow at the lower air port is utilized, and when the air conditioner cabinet is in a heating mode, the mode of air inflow at the upper air port and air outflow at the lower air port is utilized, the problem of indoor heat layering can be effectively avoided, the temperature difference of the indoor temperature can be very small in the longitudinal direction, and the utilization rate of the energy generated by the air conditioner cabinet can be effectively improved.

[0033] As shown in Fig. 6, when the regulating mechanism 40 is located at the flaring position, the mixed flow fan 30 can suck the external airflow into the housing 10 from the lower air port 12, so as to perform heat exchange with the heat exchanger 20, and then discharges the external airflow from the housing 10 by the upper air port 11. The air inflow direction and the air outflow direction of the housing can be changed by disposing the regulating mechanism 40 in the housing, this setting can solve the problem in the prior art that the air inflow mode of the housing can only be changed by utilizing a plurality of fans in the housing, and moreover, in this embodiment, the air inflow mode of the housing can be changed without changing the rotation direction of the mixed flow fan 30, such that the practicability of the air conditioner cabinet is effectively improved.

[0034] In some embodiments, as shown in Fig. 6 and Fig. 7, the air conditioner cabinet includes an air duct. The air duct includes a first air duct 51 and a second air duct 52. The first air duct 51 is disposed in the housing 10, a first end of the first air duct 51 is communicated with the lower air port 12, a second end of the first air duct 51 is connected with the regulating mechanism 40, the regulating mechanism 40 and the first air duct 51 are enclosed to form the second air duct 52, and the mixed flow fan 30 is disposed in the first air duct 51. By means of this setting, the sealing property between the regulating mechanism 40 and the first air duct 51 can be improved, so that the airflow at the lower air port 12 can smoothly enter the housing through the second air duct 52, so as to perform heat exchange with the heat exchanger.

[0035] In some embodiments, the air duct further includes a third air duct 53 and a fourth air duct 54, and the air conditioner cabinet includes a supporting portion 60. The supporting portion 60 is connected with an inner

wall of the housing 10. The regulating mechanism 40 is located below the supporting portion 60, an overflow channel 70 is disposed on the supporting portion 60, the heat exchanger 20 is connected with the supporting portion 60, the heat exchanger 20 is of a hollow structure (that is, as shown in Fig. 6, the hollow structure is a hollow cylindrical structure enclosed by a heat exchanger body), the hollow structure is communicated with the second air duct 52 through the overflow channel 70, so as to form the third air duct 53, an outer surface of the heat exchanger 20 is disposed at a distance from the housing 10, so as to form the fourth air duct 54, and the fourth air duct 54 is communicated with the upper air port 11 and the third air duct 53. By means of this setting, the installation stability of the heat exchanger can be effectively improved, the airflow at the outside of the housing can also enter the fourth air channel 54 from the third air duct 53 effectively and conveniently, or, the airflow at the outside of the housing can enter the third air duct 53 from the fourth air duct 53 conveniently.

[0036] In order to effectively drain condensed water generated in the air conditioner cabinet in time, a water pan 61 is disposed on the supporting portion 60. The water pan 61 is connected with the housing 10, the overflow channel 70 is formed on the water pan 61, and the water pan 61 is used for collecting the condensed water generated by the heat exchanger 20.

[0037] The heat exchanger 20 is of a barrel-shaped structure with an opening at one end, an open end of the heat exchanger 20 is connected with the water pan 61, an inner diameter of the open end of the heat exchanger 20 is greater than an inner diameter of the overflow channel 70, and an airflow in the third air duct 53 exchanges heat through a side wall of the heat exchanger 20 and then flows into the fourth air duct 54, or, an airflow in the fourth air duct 54 can exchanges heat through a side wall of the heat exchanger 20 and then flows into the third air duct 53. By means of this setting, the heat exchange area between the airflow and the heat exchanger can be increased. The annular fourth air channel 54 is formed between the outer surface of the heat exchanger 20 and the inner wall of the housing. Of course, a part of the side wall of the heat exchanger 20 can also be disposed in an installation manner connected with the side wall of the housing. In some embodiments, the axis of the heat exchanger 20 is coincided with the axis of the housing in the vertical direction.

[0038] The regulating mechanism 40 includes a first regulating mechanism 41 and a second regulating mechanism 42. The first end of the first regulating mechanism 41 is movably connected with the second end of the first air duct 51, a second end of the first regulating mechanism 41 is disposed away from the first air duct 51, the second end of the first regulating mechanism 41 has the necking position close to the axis of the housing 10, and the second end of the first regulating mechanism 41 has the flaring position away from the axis of the housing 10. A first end of the second regulating mechanism 42 is movably connected with the water pan 61. The second end of the second regulating mechanism 42 has the necking position close to the axis of the housing 10, and the second end of the second regulating mechanism 42 has the flaring position away from the axis (that is, the geometric centerline of the housing 10 in the vertical direction) of the housing 10, when the first regulating mechanism 41 and the second regulating mechanism 42 are both located at the necking positions, the first end of the first regulating mechanism 41 is in contact with the second end of the second regulating mechanism 42, and the first regulating mechanism 41 and the second regulating mechanism 42 are enclosed to form a sealed second air duct 52. By means of this setting, the structures of the first regulating mechanism 41 and the second regulating mechanism 42 are simple, and a switching operation between different positions can be realized easily.

[0039] When the first regulating mechanism 41 and the second regulating mechanism 42 are both located at the flaring positions, the first regulating mechanism 41 is enclosed with at least one of the second regulating mechanism 42, the housing 10, the supporting portion 60 and the water pan 61, so as to form the second air duct 52. By means of this setting, no matter what state the regulating mechanism is in, a sealed channel structure is always enclosed between the regulating mechanism and the housing. By means of this setting, the situation of air leakage inside the air conditioner cabinet can be avoided, and thus the reliability of the air conditioner cabinet is improved.

[0040] When the first regulating mechanism 41 and the second regulating mechanism 42 are both located at the necking positions, a cross sectional area of the second air duct 52 is configured to gradually decrease along a direction away from the mixed flow fan 30. When the first regulating mechanism 41 and the second regulating mechanism 42 are both located at the flaring positions, the cross sectional area of the air duct structure enclosed by the second regulating mechanism 42 is configured to gradually increase along a direction toward the mixed flow fan 30. By changing the cross sectional area of an air inflow channel at the upper end of the mixed flow fan, the mixed flow fan 30 can realizes the function of air suction or air supply. By means of this setting, there is no need to separately dispose a plurality of fans to realize the function of air suction or air supply respectively, such that the practicability of the mixed flow fan 30 is effectively improved.

[0041] In some embodiments, the first regulating mechanism 41 includes a plurality of a first arc-shaped regulating plate 411. A first end of each of the plurality of first arc-shaped regulating plate 411 is hinged with an end side wall of the first air duct 51, a second end of each of the plurality of first arc-shaped regulating plate 411 is disposed far away from the first air duct 51, the plurality of first arc-shaped regulating plates 411 are disposed along a circumferential direction of the first air duct 51, and when each of the plurality of first arc-shaped regu-

lating plates 411 is located at the necking position, the plurality of first arc-shaped regulating plates 411 are enclosed to form an annular air duct structure. A driving portion can be disposed inside the housing to drive the first arc-shaped regulating plate 411 to rotate. The driving portion can drive a single first arc-shaped regulating plate 411 alone, or one driving portion can simultaneously drive the plurality of first arc-shaped regulating plates 411 to rotate. When the first arc-shaped regulating plates 411 are located at the flaring positions, the distances between each two first arc-shaped regulating plates 411 of the plurality of first arc-shaped regulating plates 411 become greater, therefore corresponding widths, lengths and curvatures of the first arc-shaped regulating plates 411 can be set under the premise of ensuring that when each of the plurality of first arc-shaped regulating plates 411 is located at the flaring position, the plurality of first arc-shaped regulating plates 411 can be enclosed to form a sealed air duct.

[0042] In some embodiments, the second end of the first arc-shaped regulating plate 411 is provided with a folded edge 412, and the folded edge 412 is bent toward a side of the housing 10. By means of this setting, the connection reliability between the first arc-shaped regulating plate 411 and the housing can be improved.

[0043] The second regulating mechanism 42 includes a plurality of second arc-shaped regulating plates 421. A first end of each of the plurality of second arc-shaped regulating plates 421 is hinged with the bottom of a water pan 61, and a second end of each of the plurality of second arc-shaped regulating plate 421 is disposed to be able to rotate around a hinge point of the first end of the second arc-shaped regulating plate 421 and the water pan 61. The plurality of second arc-shaped regulating plates are disposed along a circumferential direction of the overflow channel, the plurality of second arc-shaped regulating plates 421 are disposed along a circumferential direction of the overflow channel 70, and when each of the plurality of second arc-shaped regulating plate 421 is located at the necking positions, the plurality of second arc-shaped regulating plates 421 are enclosed to form an annular air duct structure. By setting the second regulating mechanism 42 into an arc-shaped regulating plate-like structure, the processing difficulty of the second regulating mechanism can be reduced. At the same time, the structure is simple, and the operation reliability is high. The driving mode of the second regulating mechanism can be the driving mode of the first regulating mechanism.

[0044] In some embodiments, the supporting portion 60 further includes an annular supporting platform 62. The annular supporting platform 62 is connected with an inner wall of the housing 10. The water pan 61 is connected with the annular supporting platform 62 and is located above the annular supporting platform 62, and when the second arc-shaped regulating plate 421 is located at the flaring position, the second end of the second arc-shaped regulating plate 421 is in sealing connection with an inner circumferential surface of the annular supporting platform 62. By means of this setting, the installation stability of the water pan can be improved, and the sealing property between the regulating mechanism and the housing is improved.

[0045] A bottom of the annular supporting platform 62 is provided with an inclined plane, and when the second arc-shaped regulating plate 421 is located at the flaring position, a lower surface of the second arc-shaped regulating plate 421 is parallel to the inclined plane. By means of this setting, the wind resistance of the airflow can be effectively reduced, and the flow noise of the airflow is reduced.

[0046] In some embodiments, the heat exchanger 20 is of a cylindrical structure, an axis of the heat exchanger 20 is disposed along a vertical direction, and an end of the heat exchanger 20 close to the upper air port 11 is provided with a top plate 21. By means of this setting, the airflow can only enter or exit through a side wall of the heat exchanger, thereby increasing the heat exchange area between the airflow and the heat exchanger, and improving the heat exchange performance of the air conditioner cabinet. In some embodiments, the heat exchanger is an evaporator.

[0047] In some embodiments, the air conditioner cabinet with this structure can realize the selection of comfortable air outflow function of upper and lower convection, optimize the distribution of an indoor temperature field, and improve the energy utilization efficiency. In some embodiments, one air port is disposed above and below the vertical air conditioner cabinet respectively, the internal structure is provided with a mixed flow fan structure, different air outflow modes of upper and lower convection are realized through the transformation of the internal mechanism by means of utilizing the characteristics of the mixed flow fan, therefore upper and lower circulation convection is realized in the refrigeration and heating modes. During refrigeration, air is discharged from the upper air port and returns from the lower air port, and during heating, the air is discharged from the lower air port and returns from the upper air port. Heat recovery and utilization can be carried out according to the characteristics of cold and hot air, and then the operating mode of the whole machine can be regulated, so as to achieve the effects of energy saving, comfort and power saving.

[0048] As shown in Fig. 6 and Fig. 7, the inside of the housing includes a base, a mixed flow fan, an air duct, a water pan, an evaporator, a regulating mechanism, an upper air port, a lower air port and a top cover. The operation of the product mainly relies on the characteristics of the mixed flow fan, the mixed flow fan is a fan between a centrifugal fan and an axial flow fan, which can output the effects of axial working and centrifugal working, in-depth research on the mixed flow fan shows that, the mixed flow fan has different output conditions under different internal pressures, in the structure shown in the figure, when the internal regulating mechanism is fully opened, the pressure of the internal channel becomes

smaller, then the mixed flow fan will do more work in an axial flow mode, as a result, the fan sucks air from the lower air port and supplies the air upward, the air passes through the evaporator from both sides for heat exchange through a middle through hole position of the water pan, and is finally gathered at the upper air port for air supply. When the internal regulating mechanism is closed to a necking, the pressure in the internal air duct becomes greater, then the mixed flow fan will do more work in a centrifugal mode, such that the fan supplies the air radially and directly from the lower air port next to the fan, resulting in internal air suction, and as a result, a reverse operation mode is realized. The air enters from the upper air port, passes through the evaporator from the surrounding to the middle, and enters the air duct from the middle position of the water pan. The air is supplied to the lower air port under the driven of the fan, so as to realize the purpose of lower air supply.

[0049] According to another embodiment of the present invention, a method for controlling an air conditioner cabinet is provided. The method is used for controlling the above-mentioned air conditioner cabinet, and the method includes the following steps: when a heating mode is selected by a controller of the air conditioner cabinet, the regulating mechanism 40 is located at the necking position, the mixed flow fan 30 sucks the external airflow into the housing 10 from the upper air port 11, so as to perform heat exchange with the heat exchanger 20, and then discharges the external airflow from the housing 10 through the lower air port 12; and when a refrigeration mode is selected by the controller, the regulating mechanism 40 is located at the flaring position, the mixed flow fan 30 sucks the external airflow into the housing 10 from the lower air port 12, so as to perform heat exchange with the heat exchanger 20, and then discharges the external airflow from the housing 10 through the upper air port 11. The air conditioner cabinet further includes an air supply mode, when the air supply mode is selected by the controller, the regulating mechanism 40 is located at the necking position, the mixed flow fan 30 sucks the external airflow into the housing 10 from the upper air port 11, and then discharges the external airflow from the housing 10 through the lower air port 12, or, when the air supply mode is selected by the controller, the regulating mechanism 40 is located at the flaring position, the mixed flow fan 30 sucks the external airflow into the housing 10 from the lower air port 12, and then discharges the external airflow from the housing 10 through the upper air port 11, and the heat exchanger 20 is in a non-working state in the air supply mode, that is, the heat exchanger does not perform heat exchange work.

[0050] For ease of description, spatially relative terms can be used here, for example, "on", "above", "on the surface of", "on the top" and the like are used for describing the spatial positional relationship between one device or feature and other devices or features shown in the figure. It should be understood that, the spatially relative terms are intended to encompass different orientations in use or operation other than the orientation of the device described in the figure. For example, if the device in the figure is inverted, then it is described as "above other devices or structures", or the device "above other devices or structures" will be positioned as "below other devices or structures" or "under other devices or structures". Thus, the exemplary term "above" can include two orientations of "above" and "below". The device can also be positioned in other different ways (rotated by 90 degrees or in other orientations), and the spatially relative description used here is explained accordingly.

[0051] In addition to the above description, it should be noted that "one embodiment", "another embodiment", "embodiment" and the like mentioned in this specification refer to that specific features, structures, or features described in conjunction with this embodiment are included in at least one embodiment that is described generally in the present application. The same expression at multiple places in the specification does not necessarily refer to the same embodiment. Furthermore, when a specific feature, structure or characteristic is described in combination with any embodiment, it is claimed that the implementation of this feature, structure or characteristic in conjunction with other embodiments also falls within the scope of the present invention, which is defined solely by the appended set of claims.

[0052] In the above-mentioned embodiments, the description of each embodiment has its own focus. For parts that are not described in detail in a certain embodiment, reference can be made to related descriptions of other embodiments.

[0053] The foregoing descriptions are only preferred embodiments of the present invention, and are not intended to limit the present application. For those skilled in the art, the present application can have various modifications and changes, as long as they fall within the scope of the present invention as defined by the appended set of claims.

Claims

1. An air conditioner cabinet, comprising:

a housing (10), wherein the housing (10) is provided with an upper air port (11) and a lower air port (12);
a mixed flow fan (30), wherein the mixed flow fan (30) is disposed in the housing (10); and
a regulating mechanism (40), wherein the regulating mechanism (40) is disposed in the housing (10), the regulating mechanism (40) has a necking position and a flaring position, and when the regulating mechanism (40) is located at the necking position, the mixed flow fan (30) sucks an external airflow into the housing (10) from the upper air port (11), and then discharges the ex-

ternal airflow from the housing (10) by the lower air port (12);
characterised in that:

a heat exchanger (20), wherein the heat exchanger (20) is disposed in the housing (10) and is located between the upper air port (11) and the lower air port (12), the regulating mechanism (40) is located between the mixed flow fan (30) and the heat exchanger (20), the regulating mechanism (40) has the necking position where the regulating mechanism contracts toward an axis of the housing (10), the regulating mechanism (40) has the flaring position where the regulating mechanism gradually expands away from the axis of the housing (10), and when the regulating mechanism (40) is located at the necking position, the mixed flow fan (30) sucks the external airflow into the housing (10) from the upper air port (11), so as to perform heat exchange with the heat exchanger (20), and then discharges the external airflow from the housing (10) by the lower air port (12);
wherein when the regulating mechanism (40) is located at the flaring position, the mixed flow fan (30) sucks the external airflow into the housing (10) from the lower air port (12), so as to perform heat exchange with the heat exchanger (20), and then discharges the external airflow from the housing (10) by the upper air port (11).

2. The air conditioner cabinet as claimed in claim 1, wherein the air conditioner cabinet comprises an air duct, the air duct comprises a first air duct (51) and a second air duct (52), the first air duct (51) is disposed in the housing (10), a first end of the first air duct (51) is communicated with the lower air port (12), a second end of the first air duct (51) is connected with the regulating mechanism (40), the regulating mechanism (40) and the first air duct (51) are enclosed to form the second air duct (52), and the mixed flow fan (30) is disposed in the first air duct (51).

3. The air conditioner cabinet according to claim 2, wherein the air duct further comprises a third air duct (53) and a fourth air duct (54), the air conditioner cabinet comprises:
a supporting portion (60), wherein the supporting portion (60) is connected with an inner wall of the housing (10), the regulating mechanism (40) is located below the supporting portion (60), an overflow channel (70) is disposed on the supporting portion (60), and the heat exchanger (20) is connected with the supporting portion (60).

4. The air conditioner cabinet as claimed in claim 3, wherein the heat exchanger (20) is of a hollow structure, the hollow structure is communicated with the second air duct (52) through the overflow channel (70), so as to form the third air duct (53), an outer surface of the heat exchanger (20) is disposed at a distance from the housing (10), so as to form the fourth air duct (54), and the fourth air duct (54) is communicated with the upper air port (11) and the third air duct (53).

5. The air conditioner cabinet as claimed in claim 3, wherein the supporting portion (60) comprises:
a water pan (61), wherein the water pan (61) is connected with the housing (10), the overflow channel (70) is formed on the water pan (61), and the water pan (61) is used for collecting condensed water generated by the heat exchanger (20).

6. The air conditioner cabinet as claimed in claim 5, wherein the heat exchanger (20) is of a barrel-shaped structure with an opening at one end, an open end of the heat exchanger (20) is connected with the water pan (61), an inner diameter of the open end of the heat exchanger (20) is greater than an inner diameter of the overflow channel (70), and an airflow in the third air duct (53) exchanges heat through a side wall of the heat exchanger (20) and then flows into the fourth air duct (54), or an airflow in the fourth air duct (54) exchanges heat through a side wall of the heat exchanger (20) and then flows into the third air duct (53).

7. The air conditioner cabinet as claimed in claim 5, wherein the regulating mechanism (40) comprises:

a first regulating mechanism (41), wherein a first end of the first regulating mechanism (41) is movably connected with the second end of the first air duct (51), a second end of the first regulating mechanism (41) is disposed away from the first air duct (51), the second end of the first regulating mechanism (41) has the necking position close to the axis of the housing (10), and the second end of the first regulating mechanism (41) has the flaring position away from the axis of the housing (10); and
a second regulating mechanism (42), wherein a first end of the second regulating mechanism (42) is movably connected with the water pan (61), a second end of the second regulating mechanism (42) has the necking position close to the axis of the housing (10), and the second end of the second regulating mechanism (42) has the flaring position away from the axis of the housing (10), when the first regulating mechanism (41) and the second regulating mechanism (42) are both located at the necking positions,

the first end of the first regulating mechanism (41) is in contact with the second end of the second regulating mechanism (42), and the first regulating mechanism (41) and the second regulating mechanism (42) are enclosed to form a sealed second air duct (52).

8. The air conditioner cabinet as claimed in claim 7, wherein when the first regulating mechanism (41) and the second regulating mechanism (42) are both located at the flaring positions, the first regulating mechanism (41) is enclosed with at least one of the second regulating mechanism (42), the housing (10), the supporting portion (60) and the water pan (61), so as to form the second air duct (52).

9. The air conditioner cabinet as claimed in claim 7, wherein when the first regulating mechanism (41) and the second regulating mechanism (42) are both located at the necking positions, a cross sectional area of the second air duct (52) is configured to gradually decrease along a direction away from the mixed flow fan (30); when the first regulating mechanism (41) and the second regulating mechanism (42) are both located at the flaring positions, a cross sectional area of the air duct structure enclosed by the second regulating mechanism (42) is configured to gradually increase along a direction toward the mixed flow fan (30).

10. The air conditioner cabinet as claimed in claim 7, wherein the first regulating mechanism (41) comprises:
a plurality of a first arc-shaped regulating plate (411), a first end of each of the plurality of first arc-shaped regulating plate (411) is hinged with an end side wall of the first air duct (51), a second end of each of the plurality of first arc-shaped regulating plate (411) is disposed far away from the first air duct (51), the plurality of first arc-shaped regulating plates (411) are disposed along a circumferential direction of the first air duct (51), and when each of the plurality of first arc-shaped regulating plates (411) is located at the necking position, the plurality of first arc-shaped regulating plates (411) are enclosed to form an annular air duct structure.

11. The air conditioner cabinet as claimed in claim 7, wherein the second regulating mechanism (42) comprises:
a plurality of second arc-shaped regulating plates (421), a first end of each of the plurality of second arc-shaped regulating plates (421) is hinged with a bottom of the water pan (61), a second end of each of the plurality of second arc-shaped regulating plate (421) is disposed to be able to rotate around a hinge point of the first end of the second arc-shaped regulating plate (421) and the water pan (61), the plurality of second arc-shaped regulating plates (421) are disposed along a circumferential direction of the overflow channel (70), and when each of the plurality of second arc-shaped regulating plate (421) is located at the necking positions, the plurality of second arc-shaped regulating plates (421) are enclosed to form an annular air duct structure.

12. A method for controlling an air conditioner cabinet, the method is used for controlling the air conditioner cabinet according to any one of claims 1-11, wherein the method comprises following steps:

when a heating mode is selected by a controller of the air conditioner cabinet, the regulating mechanism (40) is located at the necking position, the mixed flow fan (30) sucks the external airflow into the housing (10) from the upper air port (11), so as to perform heat exchange with the heat exchanger (20), and then discharges the external airflow from the housing (10) through the lower air port (12); and
when a refrigeration mode is selected by the controller, the regulating mechanism (40) is located at the flaring position, the mixed flow fan (30) sucks the external airflow into the housing (10) from the lower air port (12), so as to perform heat exchange with the heat exchanger (20), and then discharges the external airflow from the housing (10) through the upper air port (11).

13. The method as claimed in claim 12, wherein the air conditioner cabinet further comprises an air supply mode, when the air supply mode is selected by the controller, the regulating mechanism (40) is located at the necking position, the mixed flow fan (30) sucks the external airflow into the housing (10) from the upper air port (11), and then discharges the external airflow from the housing (10) through the lower air port (12), or, when the air supply mode is selected by the controller, the regulating mechanism (40) is located at the flaring position, the mixed flow fan (30) sucks the external airflow into the housing (10) from the lower air port (12), and then discharges the external airflow from the housing (10) through the upper air port (11),
wherein the heat exchanger (20) is in a non-working state in the air supply mode.

Patentansprüche

1. Klimaanlagenschrank, umfassend:

ein Gehäuse (10), wobei das Gehäuse (10) mit einem oberen Luftanschluss (11) und einem unteren Luftanschluss (12) bereitgestellt ist;
ein Mischstromgebläse (30), wobei das Misch-

stromgebläse (30) in dem Gehäuse (10) angeordnet ist; und

einen Reguliermechanismus (40), wobei der Reguliermechanismus (40) in dem Gehäuse (10) angeordnet ist, der Reguliermechanismus (40) eine Einschnürungsposition und eine Aufweitungsposition aufweist und, wenn sich der Reguliermechanismus (40) an der Einschnürungsposition befindet, das Mischstromgebläse (30) einen externen Luftstrom in das Gehäuse (10) aus dem oberen Luftanschluss (11) ansaugt und dann den externen Luftstrom aus dem Gehäuse (10) durch den unteren Luftanschluss (12) abführt;

dadurch gekennzeichnet, dass:

einen Wärmetauscher (20), wobei der Wärmetauscher (20) in dem Gehäuse (10) angeordnet ist und sich zwischen dem oberen Luftanschluss (11) und dem unteren Luftanschluss (12) befindet, sich der Reguliermechanismus (40) zwischen dem Mischstromgebläse (30) und dem Wärmetauscher (20) befindet, der Reguliermechanismus (40) die Einschnürungsposition aufweist, bei der sich der Reguliermechanismus zu einer Achse des Gehäuses (10) hin zusammenzieht, der Reguliermechanismus (40) die Aufweitungsposition aufweist, bei der sich der Reguliermechanismus allmählich von der Achse des Gehäuses (10) weg ausdehnt, und, wenn sich der Reguliermechanismus (40) an der Einschnürungsposition befindet, das Mischstromgebläse (30) den externen Luftstrom in das Gehäuse (10) aus dem oberen Luftanschluss (11) ansaugt, um einen Wärmeaustausch mit dem Wärmetauscher (20) durchzuführen, und dann den externen Luftstrom aus dem Gehäuse (10) durch den unteren Luftanschluss (12) abführt;

wobei, wenn sich der Reguliermechanismus (40) an der Aufweitungsposition befindet, das Mischstromgebläse (30) den externen Luftstrom in das Gehäuse (10) aus dem unteren Luftanschluss (12) ansaugt, um einen Wärmeaustausch mit dem Wärmetauscher (20) durchzuführen, und dann den externen Luftstrom aus dem Gehäuse (10) durch den oberen Luftanschluss (11) abführt.

2. Klimaanlagenschrank nach Anspruch 1, wobei der Klimaanlagenschrank eine Luftleitung umfasst, die Luftleitung eine erste Luftleitung (51) und eine zweite Luftleitung (52) umfasst, die erste Luftleitung (51) in dem Gehäuse (10) angeordnet ist, ein erstes Ende der ersten Luftleitung (51) mit dem unteren Luftanschluss (12) kommuniziert, ein zweites Ende der ersten Luftleitung (51) mit dem Reguliermechanismus (40) verbunden ist, der Reguliermechanismus (40) und die erste Luftleitung (51) umschlossen sind, um die zweite Luftleitung (52) zu bilden, und das Mischstromgebläse (30) in der ersten Luftleitung (51) angeordnet ist.

3. Klimaanlagenschrank nach Anspruch 2, wobei die Luftleitung ferner eine dritte Luftleitung (53) und eine vierte Luftleitung (54) umfasst, wobei der Klimaanlagenschrank Folgendes umfasst:

einen Stützabschnitt (60), wobei der Stützabschnitt (60) mit einer Innenwand des Gehäuses (10) verbunden ist, sich der Reguliermechanismus (40) unter dem Stützabschnitt (60) befindet, ein Überlaufkanal (70) an dem Stützabschnitt (60) angeordnet ist und der Wärmetauscher (20) mit dem Stützabschnitt (60) verbunden ist.

4. Klimaanlagenschrank nach Anspruch 3, wobei der Wärmetauscher (20) eine hohle Struktur hat, die hohle Struktur mit der zweiten Luftleitung (52) durch den Überlaufkanal (70) kommuniziert, um die dritte Luftleitung (53) zu bilden, eine Außenfläche des Wärmetauschers (20) in einem Abstand zu dem Gehäuse (10) angeordnet ist, um die vierte Luftleitung (54) zu bilden, und die vierte Luftleitung (54) mit dem oberen Luftanschluss (11) und der dritten Luftleitung (53) kommuniziert.

5. Klimaanlagenschrank nach Anspruch 3, wobei der Stützabschnitt (60) Folgendes umfasst:

eine Wasserwanne (61), wobei die Wasserwanne (61) mit dem Gehäuse (10) verbunden ist, der Überlaufkanal (70) an der Wasserwanne (61) gebildet ist und die Wasserwanne (61) zum Sammeln von Kondenswasser, das durch den Wärmetauscher (20) erzeugt wurde, verwendet wird.

6. Klimaanlagenschrank nach Anspruch 5, wobei der Wärmetauscher (20) eine fassförmige Struktur mit einer Öffnung an einem Ende hat, ein offenes Ende des Wärmetauschers (20) mit der Wasserwanne (61) verbunden ist, ein Innendurchmesser des offenen Endes des Wärmetauschers (20) größer als ein Innendurchmesser des Überlaufkanals (70) ist und ein Luftstrom in der dritten Luftleitung (53) Wärme durch eine Seitenwand des Wärmetauschers (20) austauscht und dann in die vierte Luftleitung (54) strömt oder ein Luftstrom in der vierten Luftleitung (54) Wärme durch eine Seitenwand des Wärmetauschers (20) austauscht und dann in die dritte Luftleitung (53) strömt.

7. Klimaanlagenschrank nach Anspruch 5, wobei der Reguliermechanismus (40) Folgendes umfasst:

einen ersten Reguliermechanismus (41), wobei ein erstes Ende des ersten Reguliermechanismus (41) beweglich mit dem zweiten Ende der ersten Luftleitung (51) verbunden ist, ein zweites Ende des ersten Reguliermechanismus (41) weg von der ersten Luftleitung (51) angeordnet ist, das zweite Ende des ersten Reguliermechanismus (41) die Einschnürungsposition nahe der Achse des Gehäuses (10) aufweist und das zweite Ende des ersten Reguliermechanismus (41) die Aufweitungsposition weg von der Achse des Gehäuses (10) aufweist; und
einen zweiten Reguliermechanismus (42), wobei ein erstes Ende des zweiten Reguliermechanismus (42) beweglich mit der Wasserwanne (61) verbunden ist, ein zweites Ende des zweiten Reguliermechanismus (42) die Einschnürungsposition nahe der Achse des Gehäuses (10) aufweist und das zweite Ende des zweiten Reguliermechanismus (42) die Aufweitungsposition weg von der Achse des Gehäuses (10) aufweist, wenn sich der erste Reguliermechanismus (41) und der zweite Reguliermechanismus (42) beide an den Einschnürungspositionen befinden, das erste Ende des ersten Reguliermechanismus (41) mit dem zweiten Ende des zweiten Reguliermechanismus (42) in Kontakt steht und der erste Reguliermechanismus (41) und der zweite Reguliermechanismus (42) umschlossen sind, um eine abgedichtete zweite Luftleitung (52) zu bilden.

8. Klimaanlagenschrank nach Anspruch 7, wobei, wenn sich der erste Reguliermechanismus (41) und der zweite Reguliermechanismus (42) beide an den Aufweitungspositionen befinden, der erste Reguliermechanismus (41) mit mindestens einem von dem zweiten Reguliermechanismus (42), dem Gehäuse (10), dem Stützabschnitt (60) und der Wasserwanne (61) umschlossen sind, um die zweite Luftleitung (52) zu bilden.

9. Klimaanlagenschrank nach Anspruch 7, wobei, wenn sich der erste Reguliermechanismus (41) und der zweite Reguliermechanismus (42) beide an den Einschnürungspositionen befinden, ein Querschnittsbereich der zweiten Luftleitung (52) dazu konfiguriert ist, allmählich entlang einer Richtung von dem Mischstromgebläse (30) weg abzunehmen; wenn sich der erste Reguliermechanismus (41) und der zweite Reguliermechanismus (42) beide an den Aufweitungspositionen befinden, ein Querschnittsbereich der Luftleitungsstruktur, die durch den zweiten Reguliermechanismus (42) umschlossen ist, dazu konfiguriert ist, allmählich entlang einer Richtung zu dem Mischstromgebläse (30) hin zuzunehmen.

10. Klimaanlagenschrank nach Anspruch 7, wobei der erste Reguliermechanismus (41) Folgendes umfasst:
eine Vielzahl von ersten bogenförmigen Regulierplatten (411), wobei ein erstes Ende jeder der Vielzahl von ersten bogenförmigen Regulierplatten (411) gelenkartig an einer Endseitenwand der ersten Luftleitung (51) angebracht ist, ein zweites Ende jeder der Vielzahl von ersten bogenförmigen Regulierplatten (411) weit weg von der ersten Luftleitung (51) angeordnet ist, die Vielzahl von ersten bogenförmigen Regulierplatten (411) entlang einer Umfangsrichtung der ersten Luftleitung (51) angeordnet sind und, wenn sich jede der Vielzahl von ersten bogenförmigen Regulierplatten (411) an der Einschnürungsposition befindet, die Vielzahl von ersten bogenförmigen Regulierplatten (411) umschlossen sind, um eine ringförmige Luftleitungsstruktur zu bilden.

11. Klimaanlagenschrank nach Anspruch 7, wobei der zweite Reguliermechanismus (42) Folgendes umfasst:
eine Vielzahl von zweiten bogenförmigen Regulierplatten (421), wobei ein erstes Ende jeder der Vielzahl von zweiten bogenförmigen Regulierplatten (421) gelenkartig an einem Boden der Wasserwanne (61) angebracht ist, ein zweites Ende jeder der Vielzahl von zweiten bogenförmigen Regulierplatten (421) angeordnet ist, um sich um einen Gelenkpunkt des ersten Endes der zweiten bogenförmigen Regulierplatten (421) und der Wasserwanne (61) drehen zu können, die Vielzahl von zweiten bogenförmigen Regulierplatten (421) entlang einer Umfangsrichtung des Überlaufkanals (70) angeordnet sind und, wenn sich jede der Vielzahl von zweiten bogenförmigen Regulierplatten (421) an den Einschnürungspositionen befindet, die Vielzahl von zweiten bogenförmigen Regulierplatten (421) umschlossen sind, um eine ringförmige Luftleitungsstruktur zu bilden.

12. Verfahren zum Steuern eines Klimaanlagenschranks, wobei das Verfahren zum Steuern des Klimaanlagenschranks nach einem der Ansprüche 1-11 verwendet wird, wobei das Verfahren folgende Schritte umfasst:

wenn ein Heizmodus durch eine Steuerung des Klimaanlagenschranks ausgewählt wird, sich der Reguliermechanismus (40) an der Einschnürungsposition befindet, das Mischstromgebläse (30) den externen Luftstrom in das Gehäuse (10) aus dem oberen Luftanschluss (11) ansaugt, um einen Wärmeaustausch mit dem Wärmetauscher (20) durchzuführen, und dann den externen Luftstrom aus dem Gehäuse (10) durch den unteren Luftanschluss (12) abführt; und

wenn ein Kühlmodus durch die Steuerung ausgewählt wird, sich der Reguliermechanismus (40) an der Aufweitungsposition befindet, das Mischstromgebläse (30) den externen Luftstrom in das Gehäuse (10) aus dem unteren Luftanschluss (12) ansaugt, um einen Wärmeaustausch mit dem Wärmetauscher (20) durchzuführen, und dann den externen Luftstrom aus dem Gehäuse (10) durch den oberen Luftanschluss (11) abführt.

13. Verfahren nach Anspruch 12, wobei der Klimaanlagenschrank ferner einen Luftzufuhrmodus umfasst, wenn der Luftzufuhrmodus durch die Steuerung ausgewählt wird, sich der Reguliermechanismus (40) an der Einschnürungsposition befindet, das Mischstromgebläse (30) den externen Luftstrom in das Gehäuse (10) aus dem oberen Luftanschluss (11) ansaugt und dann den externen Luftstrom aus dem Gehäuse (10) durch den unteren Luftanschluss (12) abführt, oder, wenn der Luftzufuhrmodus durch die Steuerung ausgewählt wird, sich der Reguliermechanismus (40) an der Aufweitungsposition befindet, das Mischstromgebläse (30) den externen Luftstrom in das Gehäuse (10) aus dem unteren Luftanschluss (12) ansaugt und dann den externen Luftstrom aus dem Gehäuse (10) durch den oberen Luftanschluss (11) abführt,
wobei der Wärmetauscher (20) in einem nicht arbeitenden Zustand in dem Luftzufuhrmodus ist.

Revendications

1. Armoire de climatiseur, comprenant :

un boîtier (10), dans laquelle le boîtier (10) est pourvu d'un orifice d'air supérieur (11) et d'un orifice d'air inférieur (12) ;
un ventilateur à flux mixte (30), dans laquelle le ventilateur à flux mixte (30) est disposé dans le boîtier (10) ; et
un mécanisme de régulation (40), dans laquelle le mécanisme de régulation (40) est disposé dans le boîtier (10), le mécanisme de régulation (40) a une position d'étranglement et une position d'évasement, et lorsque le mécanisme de régulation (40) est situé au niveau de la position d'étranglement, le ventilateur à flux mixte (30) aspire un flux d'air externe dans le boîtier (10) à partir de l'orifice d'air supérieur (11), puis évacue le flux d'air externe à partir du boîtier (10) par l'orifice d'air inférieur (12) ;
caractérisée par :

un échangeur de chaleur (20), dans laquelle l'échangeur de chaleur (20) est disposé dans le boîtier (10) et est situé entre l'orifice d'air supérieur (11) et l'orifice d'air inférieur (12), le mécanisme de régulation (40) est situé entre le ventilateur à flux mixte (30) et l'échangeur de chaleur (20), le mécanisme de régulation (40) a la position d'étranglement dans laquelle le mécanisme de régulation se contracte vers un axe du boîtier (10), le mécanisme de régulation (40) a la position d'évasement dans laquelle le mécanisme de régulation s'étend progressivement à l'écart de l'axe du boîtier (10), et lorsque le mécanisme de régulation (40) est situé au niveau de la position d'étranglement, le ventilateur à flux mixte (30) aspire le flux d'air externe dans le boîtier (10) à partir de l'orifice d'air supérieur (11), de manière à exécuter un échange de chaleur avec l'échangeur de chaleur (20), puis évacue le flux d'air externe à partir du boîtier (10) par l'orifice d'air inférieur (12) ;
dans laquelle lorsque le mécanisme de régulation (40) est situé au niveau de la position d'évasement, le ventilateur à flux mixte (30) aspire le flux d'air externe dans le boîtier (10) à partir de l'orifice d'air inférieur (12), de manière à exécuter un échange de chaleur avec l'échangeur de chaleur (20), puis évacue le flux d'air externe à partir du boîtier (10) par l'orifice d'air supérieur (11).

2. Armoire de climatiseur selon la revendication 1, dans laquelle l'armoire de climatiseur comprend un conduit d'air, le conduit d'air comprend un premier conduit d'air (51) et un deuxième conduit d'air (52), le premier conduit d'air (51) est disposé dans le boîtier (10), une première extrémité du premier conduit d'air (51) est en communication avec l'orifice d'air inférieur (12), une seconde extrémité du premier conduit d'air (51) est connectée au mécanisme de régulation (40), le mécanisme de régulation (40) et le premier conduit d'air (51) sont enfermés pour former le deuxième conduit d'air (52), et le ventilateur à flux mixte (30) est disposé dans le premier conduit d'air (51).

3. Armoire de climatiseur selon la revendication 2, dans laquelle le conduit d'air comprend en outre un troisième conduit d'air (53) et un quatrième conduit d'air (54), l'armoire de climatiseur comprend :
une partie de support (60), dans laquelle la partie de support (60) est connectée à une paroi interne du boîtier (10), le mécanisme de régulation (40) est situé en dessous de la partie de support (60), un canal de trop-plein (70) est disposé sur la partie de support (60), et l'échangeur de chaleur (20) est connecté à la partie de support (60).

4. Armoire de climatiseur selon la revendication 3, dans

laquelle l'échangeur de chaleur (20) est constitué d'une structure creuse, la structure creuse communique avec le deuxième conduit d'air (52) à travers le canal de trop-plein (70), de manière à former le troisième conduit d'air (53), une surface externe de l'échangeur de chaleur (20) est disposée à distance du boîtier (10), de manière à former le quatrième conduit d'air (54), et le quatrième conduit d'air (54) est en communication avec l'orifice d'air supérieur (11) et le troisième conduit d'air (53).

5. Armoire de climatiseur selon la revendication 3, dans laquelle la partie de support (60) comprend :
un bac à eau (61), dans laquelle le bac à eau (61) est connecté au boîtier (10), le canal de trop-plein (70) est formé sur le bac à eau (61), et le bac à eau (61) est utilisé pour collecter de l'eau condensée générée par l'échangeur de chaleur (20).

6. Armoire de climatiseur selon la revendication 5, dans laquelle l'échangeur de chaleur (20) est constitué d'une structure en forme de tonneau avec une ouverture au niveau d'une extrémité, une extrémité ouverte de l'échangeur de chaleur (20) est connectée au bac à eau (61), un diamètre interne de l'extrémité ouverte de l'échangeur de chaleur (20) est supérieur à un diamètre interne du canal de trop-plein (70), et un flux d'air dans le troisième conduit d'air (53) échange de la chaleur à travers une paroi latérale de l'échangeur de chaleur (20) et s'écoule ensuite dans le quatrième conduit d'air (54), ou un flux d'air dans le quatrième conduit d'air (54) échange de la chaleur à travers une paroi latérale de l'échangeur de chaleur (20) et s'écoule ensuite dans le troisième conduit d'air (53).

7. Armoire de climatiseur selon la revendication 5, dans laquelle le mécanisme de régulation (40) comprend :

un premier mécanisme de régulation (41), dans laquelle une première extrémité du premier mécanisme de régulation (41) est connectée de manière mobile à la seconde extrémité du premier conduit d'air (51), une seconde extrémité du premier mécanisme de régulation (41) est disposée à l'écart du premier conduit d'air (51), la seconde extrémité du premier mécanisme de régulation (41) a la position d'étranglement proche de l'axe du boîtier (10), et la seconde extrémité du premier mécanisme de régulation (41) a la position d'évasement à l'écart de l'axe du boîtier (10) ; et
un second mécanisme de régulation (42), dans laquelle une première extrémité du second mécanisme de régulation (42) est connectée de manière mobile au bac à eau (61), une seconde extrémité du second mécanisme de régulation (42) a la position d'étranglement proche de l'axe du boîtier (10), et la seconde extrémité du second mécanisme de régulation (42) a la position d'évasement à l'écart de l'axe du boîtier (10), lorsque le premier mécanisme de régulation (41) et le second mécanisme de régulation (42) sont tous deux situés au niveau des positions d'étranglement, la première extrémité du premier mécanisme de régulation (41) est en contact avec la seconde extrémité du second mécanisme de régulation (42), et le premier mécanisme de régulation (41) et le second mécanisme de régulation (42) sont enfermés pour former un deuxième conduit d'air étanche (52).

8. Armoire de climatiseur selon la revendication 7, dans laquelle lorsque le premier mécanisme de régulation (41) et le second mécanisme de régulation (42) sont tous deux situés au niveau des positions d'évasement, le premier mécanisme de régulation (41) est enfermé avec au moins l'un du second mécanisme de régulation (42), du boîtier (10), de la partie de support (60) et du bac à eau (61), de manière à former le deuxième conduit d'air (52).

9. Armoire de climatiseur selon la revendication 7, dans laquelle lorsque le premier mécanisme de régulation (41) et le second mécanisme de régulation (42) sont tous deux situés au niveau des positions d'étranglement, une zone de section transversale du deuxième conduit d'air (52) est configurée pour diminuer progressivement le long d'une direction s'éloignant du ventilateur à flux mixte (30) ; lorsque le premier mécanisme de régulation (41) et le second mécanisme de régulation (42) sont tous deux situés au niveau des positions d'évasement, une zone de section transversale de la structure de conduit d'air entourée par le second mécanisme de régulation (42) est configurée pour augmenter progressivement le long d'une direction vers le ventilateur à flux mixte (30).

10. Armoire de climatiseur selon la revendication 7, dans laquelle le premier mécanisme de régulation (41) comprend :
une pluralité de premières plaques de régulation en forme d'arc (411), une première extrémité de chacune de la pluralité de premières plaques de régulation en forme d'arc (411) est articulée avec une paroi latérale d'extrémité du premier conduit d'air (51), une seconde l'extrémité de chacune de la pluralité de premières plaques de régulation en forme d'arc (411) est disposée loin du premier conduit d'air (51), la pluralité de premières plaques de régulation en forme d'arc (411) sont disposées le long d'une direction circonférentielle du premier conduit d'air (51), et lorsque chacune de la pluralité de premières plaques de régulation en forme d'arc (411) est située au niveau de la position d'étranglement, la pluralité de premières plaques de régulation en forme d'arc

(411) sont enfermées pour former une structure de conduit d'air annulaire.

11. Armoire de climatiseur selon la revendication 7, dans laquelle le second mécanisme de régulation (42) comprend :
une pluralité de secondes plaques de régulation en forme d'arc (421), une première extrémité de chacune de la pluralité de secondes plaques de régulation en forme d'arc (421) est articulée avec un fond du bac à eau (61), une seconde extrémité de chacune de la pluralité de secondes plaques de régulation en forme d'arc (421) est disposée de manière à pouvoir tourner autour d'un point d'articulation de la première extrémité de la seconde plaque de régulation en forme d'arc (421) et du bac à eau (61), la pluralité de secondes plaques de régulation en forme d'arc (421) sont disposées le long d'une direction circonférentielle du canal de trop-plein (70), et lorsque chacune de la pluralité de secondes plaques de régulation en forme d'arc (421) est située au niveau des positions d'étranglement, la pluralité de secondes plaques de régulation en forme d'arc (421) sont enfermées pour former une structure de conduit d'air annulaire.

12. Procédé de commande d'une armoire de climatiseur, le procédé est utilisé pour commander l'armoire de climatiseur selon l'une quelconque des revendications 1 à 11, dans lequel le procédé comprend les étapes suivantes :

lorsqu'un mode de chauffage est sélectionné par un dispositif de commande de l'armoire de climatiseur, le mécanisme de régulation (40) est situé au niveau de la position d'étranglement, le ventilateur à flux mixte (30) aspire le flux d'air externe dans le boîtier (10) à partir de l'orifice d'air supérieur (11), de manière à exécuter un échange de chaleur avec l'échangeur de chaleur (20), puis évacue le flux d'air externe à partir du boîtier (10) à travers l'orifice d'air inférieur (12) ; et
lorsqu'un mode de réfrigération est sélectionné par le dispositif de commande, le mécanisme de régulation (40) est situé au niveau de la position d'évasement, le ventilateur à flux mixte (30) aspire le flux d'air externe dans le boîtier (10) à partir de l'orifice d'air inférieur (12), de manière à exécuter un échange de chaleur avec l'échangeur de chaleur (20), puis évacue le flux d'air externe à partir du boîtier (10) à travers l'orifice d'air supérieur (11).

13. Procédé selon la revendication 12, dans lequel l'armoire de climatiseur comprend en outre un mode d'alimentation en air, lorsque le mode d'alimentation en air est sélectionné par le dispositif de commande, le mécanisme de régulation (40) est situé au niveau de la position d'étranglement, le ventilateur à flux mixte (30) aspire le flux d'air externe dans le boîtier (10) à partir de l'orifice d'air supérieur (11), puis évacue le flux d'air externe à partir du boîtier (10) à travers l'orifice d'air inférieur (12), ou, lorsque le mode d'alimentation en air est sélectionné par le dispositif de commande, le mécanisme de régulation (40) est situé au niveau de la position d'évasement, le ventilateur à flux mixte (30) aspire le flux d'air externe dans le boîtier (10) à partir de l'orifice d'air inférieur (12), puis évacue le flux d'air externe à partir du boîtier (10) à travers l'orifice d'air supérieur (11),
dans lequel l'échangeur de chaleur (20) est dans un état de non-fonctionnement dans le mode d'alimentation en air.

Fig. 1

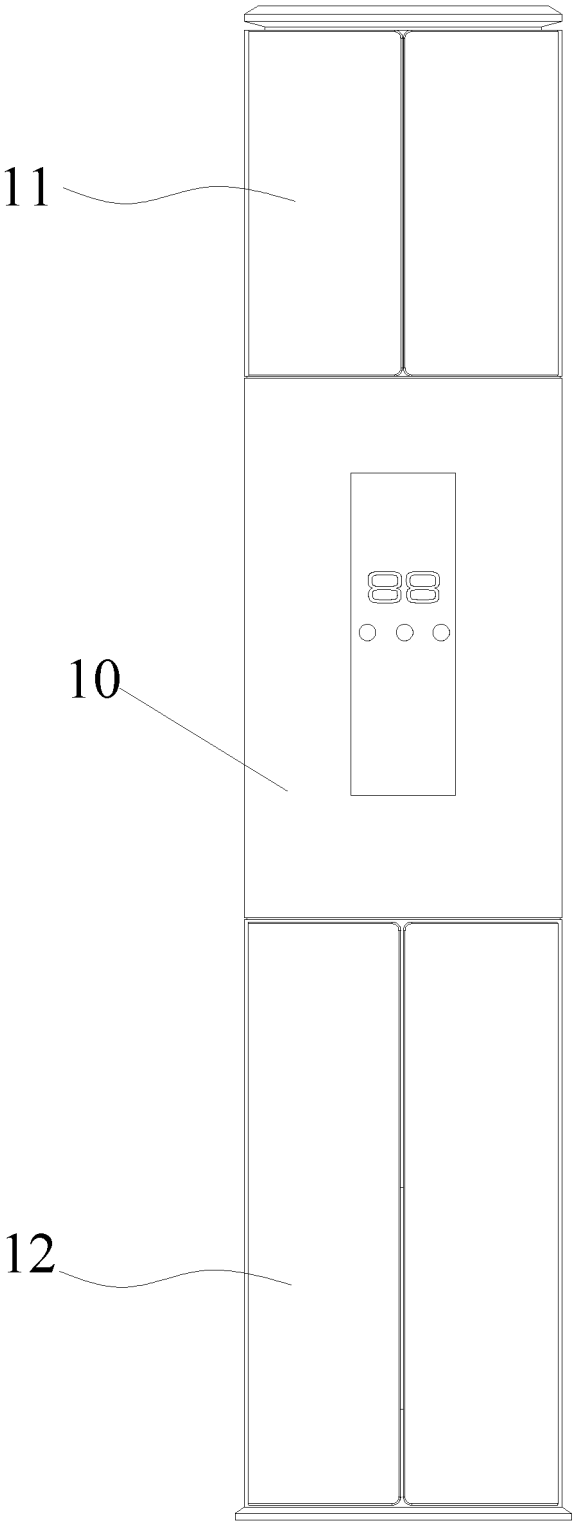

Fig. 2

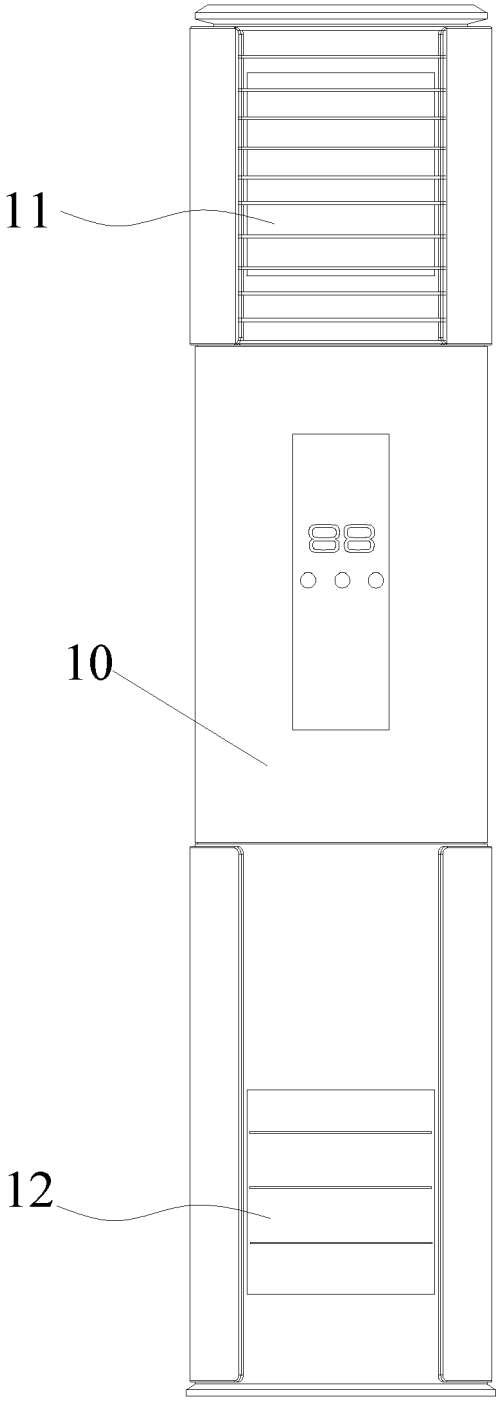

Fig. 3

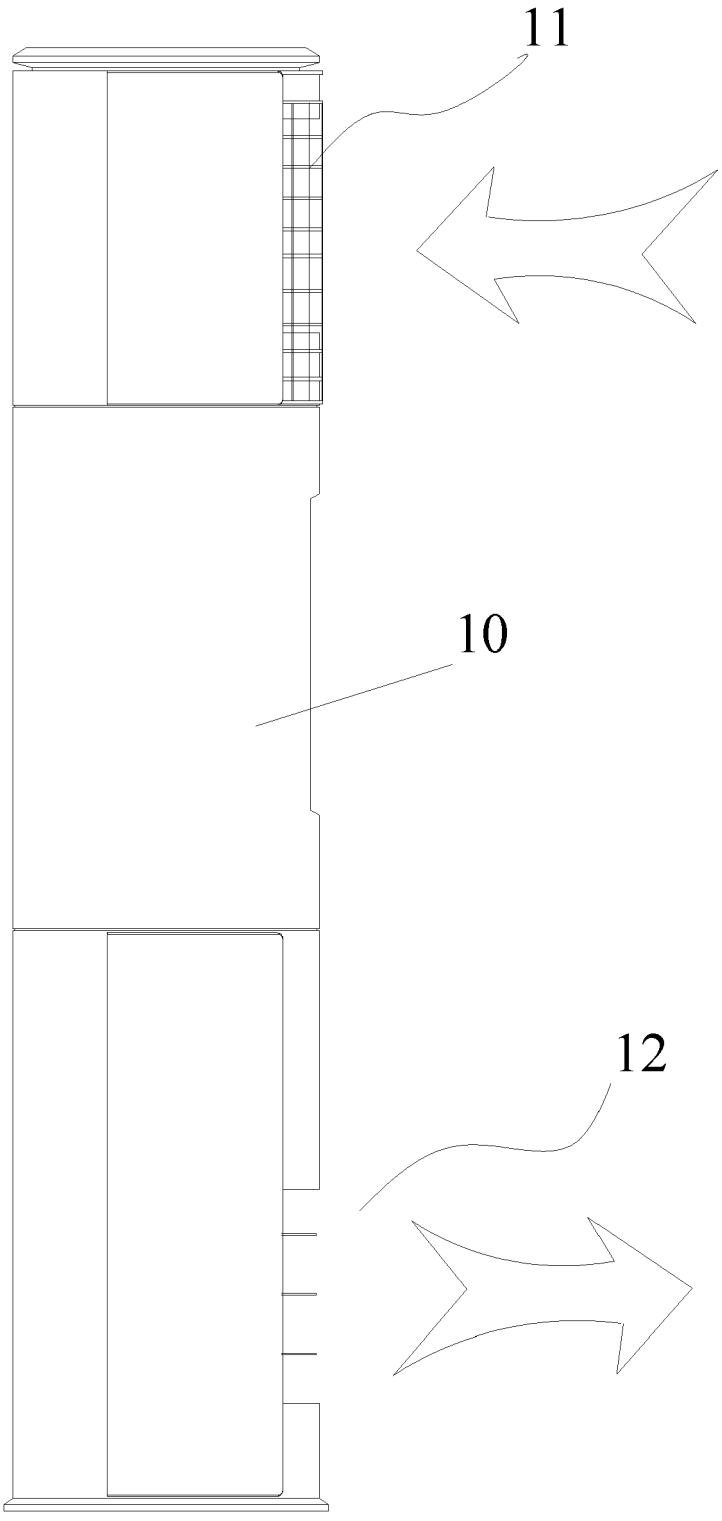

Fig. 4

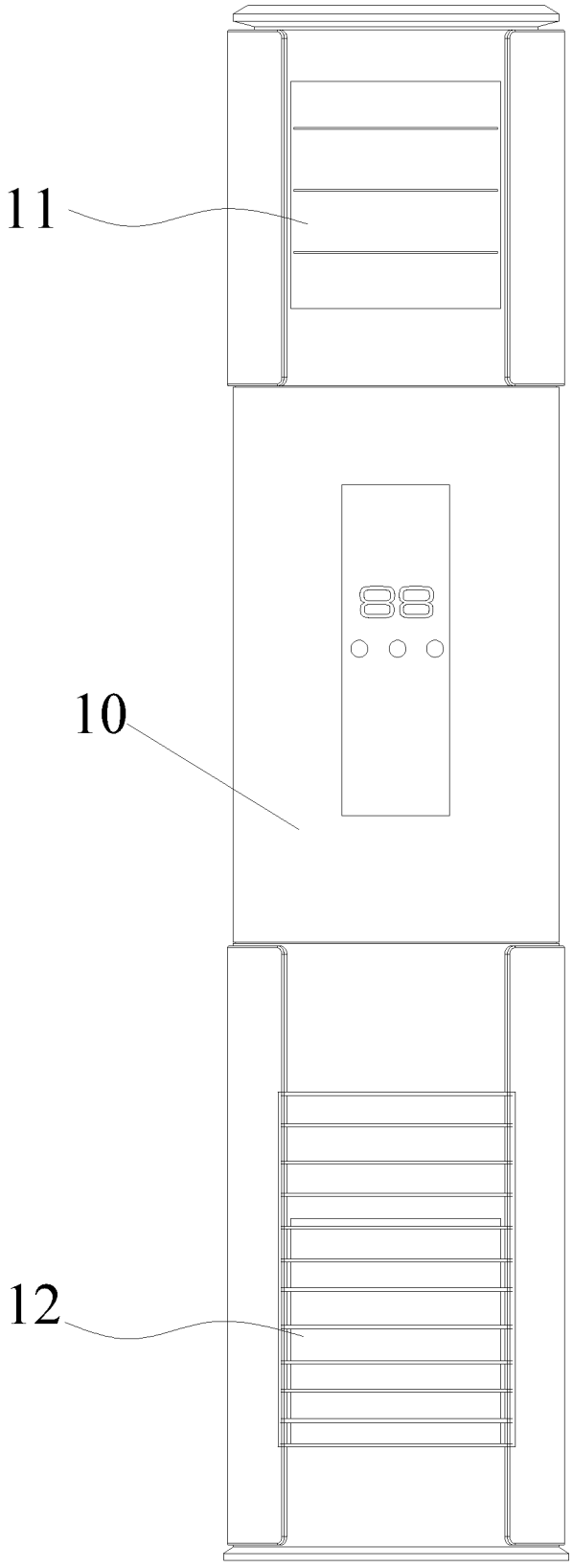

Fig. 5

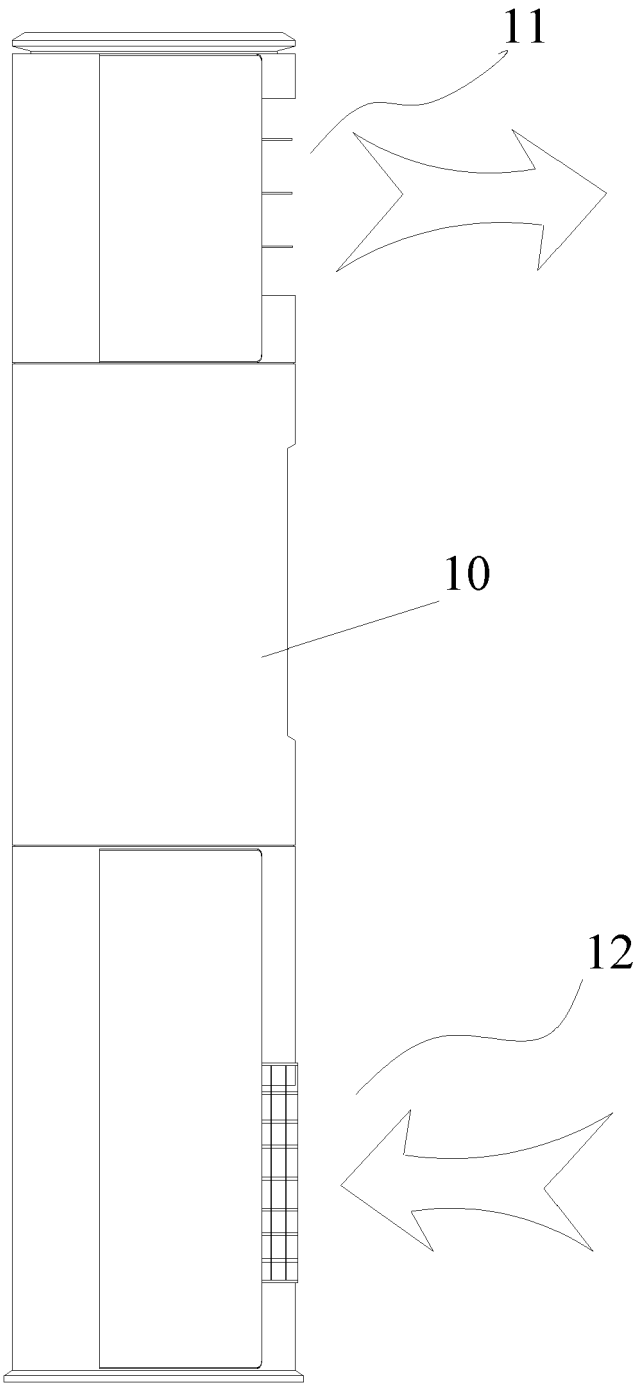

Fig. 6

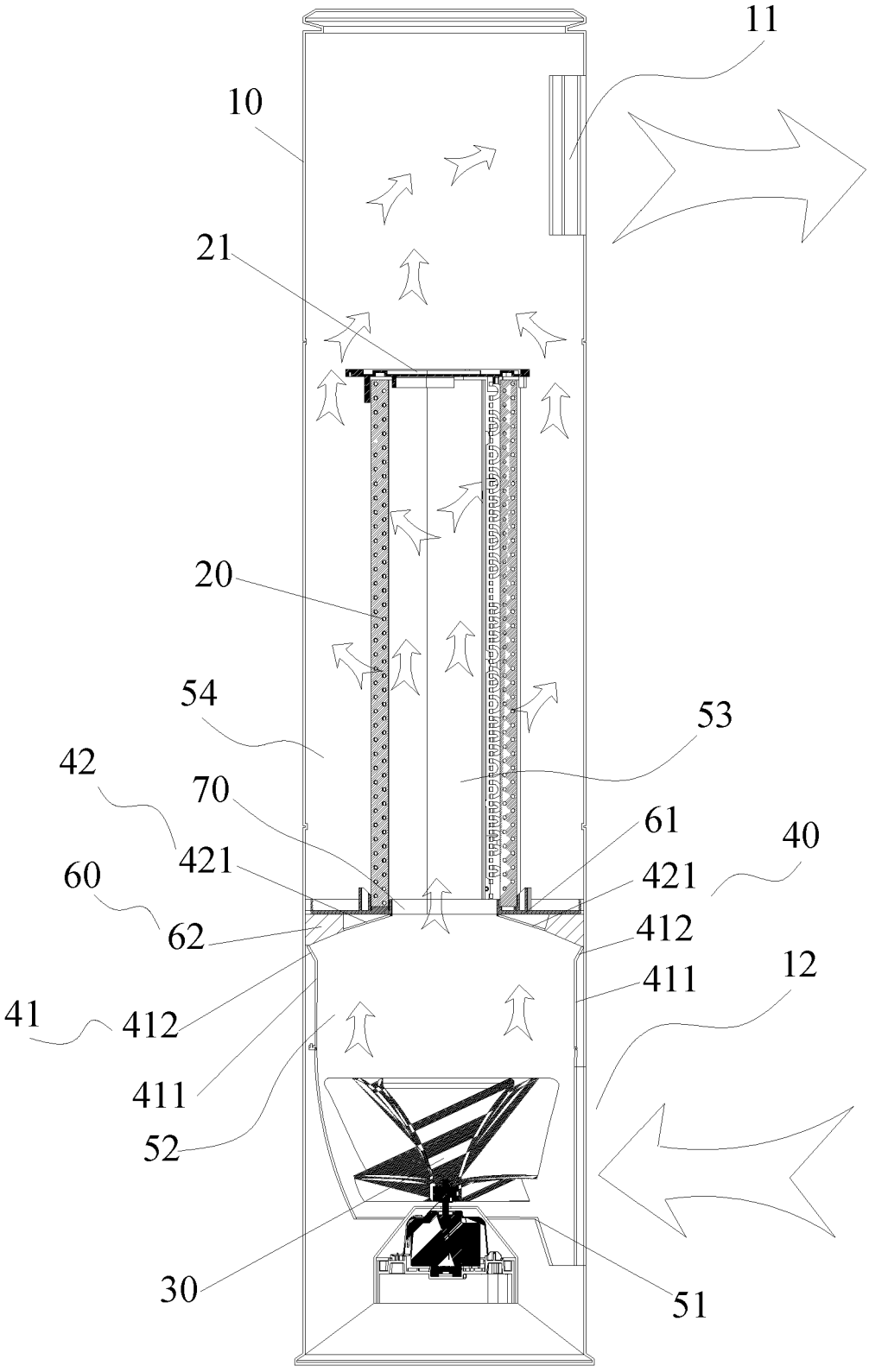
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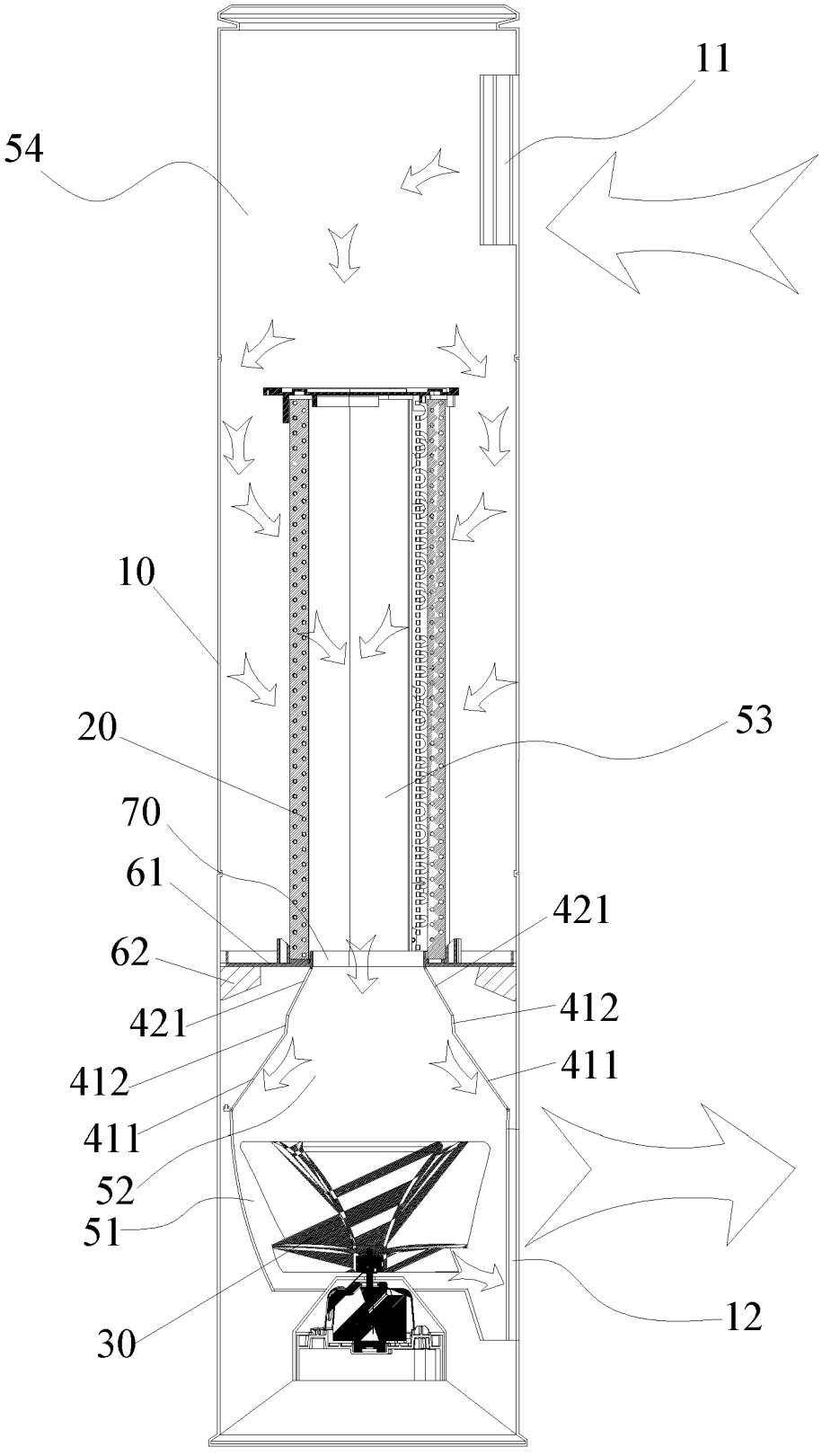
Fig. 7



REFERENCES CITED IN THE DESCRIPTION

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