



(11)

EP 3 006 851 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
25.04.2018 Bulletin 2018/17

(51) Int Cl.:
F24F 13/06 ^(2006.01) **F24F 1/00** ^(2011.01)

(21) Application number: **14807921.3**

(86) International application number:
PCT/CN2014/078217

(22) Date of filing: **23.05.2014**

(87) International publication number:
WO 2014/194771 (11.12.2014 Gazette 2014/50)

(54) **AIR-CONDITIONER WITH AIR SUPPLY APPARATUS**

KLIMAANLAGE MIT KLIMAANLAGENLUFTZUFUHRVORRICHTUNG

CLIMATISEUR COMPRENANT UN' APPAREIL D'ALIMENTATION EN AIR DE CLIMATISEUR

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**

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(30) Priority: **03.06.2013 CN 201310215916**
03.06.2013 CN 201320314277 U

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(43) Date of publication of application:
13.04.2016 Bulletin 2016/15

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Description

BACKGROUND

Technical Field

[0001] The present invention relates to the field of air conditioning technologies, and particularly to an air-conditioner air supply apparatus and an air-conditioner having same.

Related Art

[0002] US 4 526 227 A discloses a spot thermal conditioning apparatus selectively operable in warming and cooling modes includes a housing containing three blowers or fans.

[0003] CN 102 374 624 A describes an induction blow-out vent.

[0004] KR 101 234 065 B1 provides an air conditioner according to the preamble of claim 1, comprising a body, a heat exchanger, an air discharge unit, and a blowing unit. The heat exchanger is installed in the body. The air discharge unit is installed in the body and discharges air passing through the heat exchanger. The blowing unit draws the air into an air suction hole; passes through the heat exchanger; and blows the air to the air discharging unit.

[0005] When a conventional vertical air-conditioner supplies air, air is subjected to heat exchange by a heat exchanger and is directly blown out from an air outlet provided on the air-conditioner under the action of an internal fan, and all of the blown-out air is heat-exchanged air. Generally, no additional air supply apparatus is disposed between the heat exchanger and the air outlet. One disadvantage of such an air supply method of the air-conditioner is that indoor air circulation is slow because the supplied air is all heat-exchanged air and the air flow rate is low; another disadvantage is that the supplied air is not mild enough, and especially in the cooling mode, the blown-out cool air directly blows on a user, making the user feel uncomfortable.

[0006] To solve the foregoing problems, the applicant proposed an air-conditioner air supply apparatus that can be applied to an air-conditioner. The use of the air-conditioner air supply apparatus in an air-conditioner can increase the air intake volume, accelerate indoor air circulation, and enable the air-conditioner to supply milder air, thereby making the user feel more comfortable and improving the user experience. However, because the fan of the air-conditioner supplies air from bottom to top, the heat-exchanged air is not uniformly distributed in the circumferential direction when entering an air outlet duct that is not non-annular, and the air flow rate is high at the lower end of the air outlet duct that is not non-annular but low at the left and right sides of the air outlet duct. As a result, the air supplied by the air-conditioner air supply apparatus is not uniformly distributed in the entire cir-

cumferential direction, affecting the comfort of the user.

SUMMARY

[0007] One objective of the present invention is to provide an air-conditioner with an air supply apparatus, in which an airflow distribution assembly is disposed in the air-conditioner air supply apparatus, so that the airflow distribution assembly can be used to distribute air in the circumferential direction of the air supply apparatus, so as to improve the uniformity of air supply.

[0008] To achieve the foregoing objective of the present invention, the present invention is implemented by means of the following technical solutions:

An air-conditioner, comprising: an air conditioner body (1) with a housing defining an internal air duct and a centrifugal blower, an evaporator and an air-conditioner air supply apparatus being disposed in the internal air duct from bottom to top of the air conditioner body, wherein the air-conditioner air supply apparatus comprises a cover body and wherein the cover body has a front opening and a rear opening and a through-duct running through the entire cover body being formed in the middle of the cover body from the front opening to the rear opening and wherein the front opening forms a mixed air outlet and the rear opening forms a non-heat-exchanged air inlet and wherein further, a main heat-exchanged air duct is formed between the air conditioner body and a the rear end of a wall the cover body, wherein the main heat-exchanged air duct enables heat-exchanged air being blown from the evaporator via the internal air duct to the air-conditioner air supply apparatus.

[0009] The invention is characterized in that, the main heat-exchanged air duct is provided with a deflector that divides the main heat-exchanged air duct into a plurality of heat-exchanged air duct branches that communicate the internal air duct with the through-duct and; an airflow distribution assembly is disposed in the main heat-exchanged air duct for circumferentially distributing heat-exchanged air, that enters the main heat-exchanged air duct from the internal air duct, by extending into the heat-exchanged air duct branches and; wherein further, the cover body, the main heat-exchanged air duct and the heat-exchanged air duct branches have a shape of the majority of a circle but are non-annular by having a notch at a lower part.

[0010] Further designs options for the air-conditioner air supply apparatus of the air conditioner are the following:

An air-conditioner air supply apparatus includes a non-annular cover body, where a through-duct running through the non-annular cover body is formed in the middle of the non-annular cover body, the non-annular cover body has a front opening and a rear

opening, the front opening forms a mixed air outlet, the rear opening forms a non-heat-exchanged air inlet, a non-annular main heat-exchanged air duct communicating an internal air duct of an air-conditioner having the air-conditioner air supply apparatus with the through-duct is formed on a wall of the non-annular cover body, and an airflow distribution assembly for circumferentially distributing heat-exchanged air that enters the main heat-exchanged air duct from a heat exchanger of the air-conditioner is disposed in the non-annular main heat-exchanged air duct.

[0011] In the air-conditioner air supply apparatus described above, to stabilize and guide the air flow, one or more non-annular deflectors are provided on the non-annular main heat-exchanged air duct, the non-annular deflector divides the non-annular main heat-exchanged air duct into a plurality of heat-exchanged air duct branches communicating the internal air duct of the air-conditioner with the through-duct, and the airflow distribution assembly is disposed in all of the heat-exchanged air duct branches.

[0012] In the air-conditioner air supply apparatus described above, the airflow distribution assembly includes a plurality of airflow distribution plates, and the plurality of airflow distribution plates is bilaterally symmetrically arranged in a circumferential direction of the non-annular heat-exchanged air duct branches, and along an air supply direction of the heat-exchanged air.

[0013] In the air-conditioner air supply apparatus described above, the plurality of airflow distribution plates is bent distribution plates of the same bending direction, and the bending direction of the plurality of airflow distribution plates is reverse to the air supply direction of the heat-exchanged air.

[0014] In the air-conditioner air supply apparatus described above, the airflow distribution assembly includes at least a pair of primary airflow distribution plates dividing the heat-exchanged air into left, middle and right parts, and the pair of primary airflow distribution plates is disposed at a lower part of the non-annular heat-exchanged air duct branches, and divides the non-annular heat-exchanged air duct branches into two parts whose lengths are at a ratio of 1:2 to 1:4.

[0015] In the air-conditioner air supply apparatus described above, the airflow distribution assembly further includes several pairs of auxiliary airflow distribution plates, and the several pairs of auxiliary airflow distribution plates are disposed above the primary airflow distribution plate at a gradually decreasing spacing from bottom to top.

[0016] In the air-conditioner air supply apparatus described above, the areas of the several pairs of auxiliary airflow distribution plates gradually decrease from bottom to top, and the area of the auxiliary airflow distribution plate at the lowest position is smaller than the area of the primary airflow distribution plate.

[0017] In the air-conditioner air supply apparatus described above, among the several pairs of auxiliary airflow distribution plates, the circumferential length of the non-annular heat-exchanged air duct branch between the pair of airflow distribution plates that is located at the top accounts for 1/5 to 1/3 of the total circumferential length of the non-annular heat-exchanged air duct branch.

[0018] Preferably, the surface of the airflow distribution plate is a curved surface.

[0019] In particular, an air-conditioner includes an air-conditioner body, the air-conditioner body having a front panel, a rear panel, a left panel and a right panel, an internal air duct of the air-conditioner body being defined by the front panel, the rear panel, the left panel and the right panel, where the front panel is provided with a mixed air outlet, the rear panel is provided with a non-heat-exchanged air inlet at least at a position corresponding to the mixed air outlet, the air-conditioner air supply apparatus described above is disposed inside the air-conditioner body, and the mixed air outlet and the non-heat-exchanged air inlet of the non-annular cover body in the air-conditioner air supply apparatus are respectively correspondingly sealed to the mixed air outlet on the front panel and the non-heat-exchanged air inlet on the rear panel.

[0020] Compared with the prior art, the present invention has the following advantages and positive effects: an airflow distribution assembly is disposed in the heat-exchanged air duct of the air-conditioner air supply apparatus, so that the airflow distribution assembly can be used to distribute, in the circumferential direction, the heat-exchanged air that enters the air supply apparatus, so as to the uniformity of air supply from the air supply apparatus.

[0021] Other features and advantages of the present invention will become apparent after reading the detailed description of the present invention with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022]

FIG. 1 is a schematic structural view of an embodiment of an air-conditioner according to the present invention;

FIG. 2 is a schematic three-dimensional structural view of an air-conditioner air supply apparatus in the air-conditioner in FIG. 1; and

FIG. 3 is a schematic structural front view of the air-conditioner air supply apparatus in FIG. 2.

DETAILED DESCRIPTION

[0023] The technical solutions of the present invention

are further described in detail below with reference to the accompanying drawings and the detailed description.

[0024] First, technical terms involved in the detailed description are briefly described. The front end or rear end of each structural component as mentioned below is defined in terms of the position of the structural component in the normal use state relative to the user; front or rear, when used to describe the positions at which multiple structural components are arranged, is also defined in terms of the position of an apparatus formed by the multiple structural components in the normal use state relative to the user. In the following description, heat-exchanged air refers to air that is from the inside of an air-conditioner and has been subjected to heat exchange by a heat exchanger; non-heat-exchanged air refers to air from the environmental space in which the air-conditioner is located, is relative to the heat-exchanged air, and is part of air that is not directly from the heat exchanger; and mixed air refers to air formed by mixing the heat-exchanged air with the non-heat-exchanged air. In the following description, the shape being not non-annular refers a non-enclosed structure that does not form a non-annular enclosure.

[0025] Then, the design concept of the present invention is briefly described. With an air-conditioner air supply apparatus that can produce and supply mixed air by mixing heat-exchanged air of a heat exchanger of an air-conditioner with external non-heat-exchanged air, the amount of air supplied can be increased and the temperature of air supplied can be ensured. However, because the fan inside the air-conditioner is located at the lower end, the heat-exchanged air is supplied from bottom to top after being subjected to heat exchange by the heat exchanger; in this case, once such an air-conditioner air supply apparatus is arranged in the air-conditioner, most of the heat-exchanged air enters the air-conditioner air supply apparatus from the bottom of the air-conditioner air supply apparatus under the action of the fan, and only a small amount of air enters the air-conditioner air supply apparatus from left and right sides and the top of the air-conditioner air supply apparatus, resulting in a non-uniform air supply in the circumferential direction of the air-conditioner air supply apparatus. To solve this problem, in a heat-exchanged air duct that is not non-annular in the air-conditioner air supply apparatus, an airflow distribution assembly for distributing, particularly uniformly distributing heat-exchanged air that enters the heat-exchanged air duct from the heat exchanger of the air-conditioner may be disposed, so as to make the heat-exchanged air enter the heat-exchanged air duct uniformly in the circumferential direction, thereby improving the uniformity of air supply from the air-conditioner air supply apparatus.

[0026] FIG. 1 is a schematic structural view of an embodiment of an air-conditioner having an air-conditioner air supply apparatus of the present invention.

[0027] As shown in FIG. 1, the air-conditioner of this embodiment includes an air-conditioner body 1. The air-

conditioner body 1 includes a front panel 11, a rear panel 12, a left panel, a right panel, a top plate and a bottom plate (not marked in the figure) that constitute a housing of the air-conditioner body 1. The housing defines an internal air duct 15 of the air-conditioner body 1. A mixed air outlet 111 is formed on an upper part of the front panel 11 of the air-conditioner, and a non-heat-exchanged air inlet 121 is formed on an upper part of the rear panel 12 of the air-conditioner and at a position corresponding to the mixed air outlet 111 on the front panel 11. A centrifugal blower 17, an evaporator 16 and an air-conditioner air supply apparatus 10 are disposed from bottom to top in the internal air duct 15, and the blower 17 is arranged in such a manner that air from the internal air duct 4 of the air-conditioner is blown out from the mixed air outlet 21 on the front panel 2. The structure of the air-conditioner air supply apparatus 10 is shown in FIG. 2 and FIG. 3.

[0028] FIG. 2 is a three-dimensional view and FIG. 3 is a structural front view. Referring to FIG. 2 and FIG. 3 together with FIG. 1, the air-conditioner air supply apparatus 10 in this embodiment includes a non-annular cover body 101, and a through-duct (not marked in the figure) running through the entire non-annular cover body 101 is formed in the middle of the non-annular cover body 101. A front opening of the non-annular cover body 101 forms a mixed air outlet 1016, and a rear opening of the non-annular cover body 101 forms a non-heat-exchanged air inlet 1017. A continuous non-annular main heat-exchanged air duct 1011 is formed on a wall of the non-annular cover body 101, and is specifically formed on the rear end of the wall of the non-annular cover body 101, and the internal air duct 15 of the air-conditioner body 1 is in communication with the through-duct through the non-annular main heat-exchanged air duct 1011.

[0029] To stabilize the air flow and guide the air to flow in a specified direction, the non-annular main heat-exchanged air duct 1011 is provided with a continuous non-annular deflector 1012, and the non-annular deflector 1012 divides the non-annular main heat-exchanged air duct 1011 into two continuous non-annular heat-exchanged air duct branches 1013 that communicate the internal air duct 15 with the through-duct. An airflow distribution assembly 18 that extends into an inner and outer non-annular heat-exchanged air duct branches 1013 defined by the non-annular deflector is disposed on the non-annular deflector 1012. In addition, for the convenience of machining, the airflow distribution assembly 18 is preferably integrally formed with the non-annular deflector 1012 where it is located.

[0030] When the air-conditioner air supply apparatus 10 is installed in the air-conditioner, the mixed air outlet 1016 and the non-heat-exchanged air inlet 1017 of the non-annular cover body 101 are respectively correspondingly sealed to the mixed air outlet 111 on the front panel 11 and the non-heat-exchanged air inlet 121 on the rear panel 12.

[0031] In the air-conditioner that uses the air-conditioner air supply apparatus 10 of the above structure, when

the air-conditioner operates, indoor air enters the housing of the air-conditioner, is accelerated by the centrifugal blower 17, and enters the evaporator 16 for heat exchange, and heat-exchanged air after heat exchange is blown from the internal air duct 15 to the air-conditioner air supply apparatus 10. The heat-exchanged air is distributed by the airflow distribution assembly 18 to enter the non-annular heat-exchanged air duct branches 1013 uniformly in the circumferential direction, then enter the through-duct through the non-annular heat-exchanged air duct branches 1013, and is blown out from the mixed air outlet 111 on the front panel 11 through the through-duct. The flow rate of the heat-exchanged air blown out from the non-annular heat-exchanged air duct is increased, so that the surface pressure of the corresponding non-annular deflector decreases to form a negative pressure in the through-duct. Under the negative pressure, indoor air outside the air-conditioner enters the through-duct from the non-heat-exchanged air inlet 121 on the rear panel 12, and is mixed with the heat-exchanged air blown out from the non-annular heat-exchanged air duct branches 1013 to form mixed air, and then sent to the indoors. The mixed air is mild, which makes the user feel more comfortable, thereby improving the comfort of the user. In addition, part of external air that is not subjected to heat exchange is sucked under the negative pressure generated by the air supply apparatus 10 and becomes part of the air finally supplied from the air-conditioner, which increases the overall air intake volume of the air-conditioner, accelerates indoor air circulation, and further improves the overall uniformity of indoor air.

[0032] Further, referring to FIG. 3, the airflow distribution assembly 18 in the non-annular heat-exchanged air duct branches 1013 of this embodiment is implemented by using a plurality of airflow distribution plates, and the quantity, structure, distributed positions and distribution rules of the airflow distribution plates are the same in each air duct branch. As shown in FIG. 3, the airflow distribution assembly 18 of this embodiment includes eight airflow distribution plates in pairs, namely, primary airflow distribution plates 181 and 182, first auxiliary airflow distribution plates 183 and 184, second auxiliary airflow distribution plates 185 and 186, and third auxiliary airflow distribution plates 187 and 188. All the airflow distribution plates are bent distribution plates of the same bending direction, and the surface of each of the airflow distribution plates is an arc-shaped curved surface, which can effectively guide the air, reduce pressure loss and noise during splitting of the air flow, and achieve a high-speed air supply at low noise. The four pairs of airflow distribution plates are arranged bilaterally symmetrically in the circumferential direction of the non-annular heat-exchanged air duct branches 1013 in such a manner that the primary airflow distribution plates 181 and 182, the first auxiliary airflow distribution plates 183 and 184, the second auxiliary airflow distribution plates 185 and 186, and the third auxiliary airflow distribution plates 187 and

188 are sequentially arranged from bottom to top. That is, in the air supply direction of the heat-exchanged air that is from bottom to top, the primary airflow distribution plate 181, the first auxiliary airflow distribution plate 183, the second auxiliary airflow distribution plate 185 and the third auxiliary airflow distribution plate 187 are disposed from bottom to top on the left side of the air-conditioner air supply apparatus 10 (in terms of the left and right sides in the front view of FIG. 3), and the primary airflow distribution plate 182, the first auxiliary airflow distribution plate 184, the second auxiliary airflow distribution plate 186 and the third auxiliary airflow distribution plate 188 are arranged bilaterally symmetrically on the right side of the air-conditioner air supply apparatus 10. In addition, the bending direction of each of the airflow distribution plates is reverse to the air supply direction of the heat-exchanged air. The air supply direction of the heat-exchanged air is from bottom to top, and accordingly, the bending direction of each of the airflow distribution plates will be reverse to the air supply direction, that is, each of the airflow distribution plates is bent in the anticlockwise direction shown in FIG. 3.

[0033] The airflow distribution assembly 18 formed by a plurality of bent airflow distribution plates radially symmetrically arranged is disposed in the heat-exchanged air duct, so that the primary airflow distribution plates 181 and 182 can be used to divide the heat-exchanged air from the evaporator 16 into left, middle and right parts, and the heat-exchanged air on the left and right sides is further divided by the auxiliary airflow distribution plates, uniform air intake and outtake in the circumferential direction of the heat-exchanged air duct branches of the air-conditioner air supply apparatus 10 are finally achieved, thereby improving the uniformity of air supply from the air-conditioner air supply apparatus 10.

[0034] Definitely, the airflow distribution assembly 18 may not necessarily be implemented by a plurality of bent airflow distribution plates, and may also use other structures, as long as the heat-exchanged air from the evaporator 16 can be uniformly distributed in the circumferential direction.

[0035] The shape, area and position of each of the airflow distribution plates in the heat-exchanged air duct branch 1013 are key factors affecting the uniformity of air supply. In this embodiment, the pairs of airflow distribution plates are of the same shape and area. However, for the plurality of airflow distribution plates on one side, from bottom to top, the area of the primary airflow distribution plate 181 or 182 is greater than that of the first auxiliary airflow distribution plate 183 or 184, the area of the first auxiliary airflow distribution plate 183 or 184 is greater than that of the second auxiliary airflow distribution plate 185 or 186, and the area of the fourth auxiliary airflow distribution plate 185 or 186 is greater than that of the third auxiliary airflow distribution plate 187 or 188.

[0036] Furthermore, because the density of air flow is not identical in the circumferential direction, the airflow distribution plates on the same side are distributed at

unequal spacings. In particular, the length of an arc L2 between the primary airflow distribution plate 181 or 182 and the first auxiliary airflow distribution plate 183 or 184 (indicating the spacing between the two) is greater than the length of an arc L3 between the first auxiliary airflow distribution plate 183 or 184 and the second auxiliary airflow distribution plate 185 or 186, and the length of the arc L3 between the first auxiliary airflow distribution plate 183 or 184 and the second auxiliary airflow distribution plate 185 or 186 is greater than the length of an arc L4 between the second auxiliary airflow distribution plate 185 or 186 and the third auxiliary airflow distribution plate 187 or 188. Preferably, the ratio of the lengths of the arc L2, the arc L3 and the arc L4 is 6:5:3.

[0037] Moreover, for the primary airflow distribution plates 181 and 182 disposed in the non-annular heat-exchanged air duct branches 1013, the two non-annular heat-exchanged air duct branches 1013 where they are located are divided into an upper part and a lower part, the lower part being corresponding to the arc L1, and all other arcs being the upper part. To ensure the uniformity of air supply in the circumferential direction, the ratio of the length of the arc L1 corresponding to the lower part to the length of the arcs of the upper part (not marked in the figure, which are arcs in the entire circumferential direction other than L1) is 1:2 to 1:4. The third auxiliary airflow distribution plates 187 and 188 at the top of the two non-annular heat-exchanged air duct branches 1013 define an arc L5 at the top, and the length of the arc L5 accounts for 1/5 to 1/3 of the total circumferential length of the non-annular heat-exchanged air duct branches 1013.

[0038] In this embodiment, the mixed air outlet 111 on the front panel 11 and the non-heat-exchanged air inlet 121 on the rear panel 12 are preferably in the shape of the majority of a circle; and correspondingly, the cover body 101 that according to the invention is non-annular in the air-conditioner air supply apparatus 10 is in the shape of the majority of a circle and non-annular (that is, a notch is formed at the lower part of a circular non-annular shape). In addition to the non-annular shape, the technical objectives of the present invention can also be achieved by using other combinations of shapes, for example, the majority of an ellipse and the majority of an elliptical ring, or a non-enclosed polygon and a non-enclosed polygonal ring.

[0039] The foregoing embodiments are merely used to describe rather than limit the technical solutions of the present invention. Although the present invention is described in detail with reference to the foregoing embodiments, a person of ordinary skill in the art can still make modifications to the technical solutions described in the foregoing embodiments, or make equivalent replacements to some technical features thereof.

Claims

1. An air-conditioner, comprising: an air conditioner body (1) with a housing defining an internal air duct (15) and a centrifugal blower (17), an evaporator (16) and an air-conditioner air supply apparatus (10) being disposed in the internal air duct (15) from bottom to top of the air conditioner body (1), wherein the air-conditioner air supply apparatus (10) comprises a cover body (101) and wherein the cover body (101) has a front opening and a rear opening and a through-duct running through the entire cover body (101) being formed in the middle of the cover body (101) from the front opening to the rear opening and wherein the front opening forms a mixed air outlet (111) and the rear opening forms a non-heat-exchanged air inlet (121) and wherein further, a main heat-exchanged air duct (1011) is formed between the air conditioner body (1) and the rear end of a wall of the cover body (101), wherein the main heat-exchanged air duct (1011) enables heat-exchanged air being blown from the evaporator (16) via the internal air duct (15) to the air-conditioner air supply apparatus (10),
characterized in that,
the main heat-exchanged air duct (1011) is provided with a deflector (1012) that divides the main heat-exchanged air duct (1011) into a plurality of heat-exchanged air duct branches (1013) that communicate the internal air duct (15) with the through-duct and;
an airflow distribution assembly (18) is disposed in the main heat-exchanged air duct (1011) for circumferentially distributing heat-exchanged air, that enters the main heat-exchanged air duct (1011) from the internal air duct (15), by extending into the heat-exchanged air duct branches (1013) and;
wherein further, the cover body (101), the main heat-exchanged air duct (1011) and the heat-exchanged air duct branches (1013) have a shape of the majority of a circle but are non-annular by having a notch at a lower part.
2. The air-conditioner according to claim 1, wherein the airflow distribution assembly comprises a plurality of airflow distribution plates (181...188), and the plurality of airflow distribution plates is bilaterally symmetrically arranged in a circumferential direction of the non-annular heat-exchanged air duct branches, and along an air supply direction of the heat-exchanged air.
3. The air-conditioner according to claim 2, wherein the plurality of airflow distribution plates is bent distribution plates of the same bending direction, and the bending direction of the plurality of airflow distribution plates is reverse to the air supply direction of the heat-exchanged air.

4. The air-conditioner according to claim 3, wherein the airflow distribution assembly comprises at least a pair of primary airflow distribution plates (181, 182) dividing the heat-exchanged air into left, middle and right parts, and the pair of primary airflow distribution plates is disposed at a lower part of the non-annular heat-exchanged air duct branches, and divides the non-annular heat-exchanged air duct branches into two parts whose lengths are at a ratio of 1:2 to 1:4.
5. The air-conditioner according to claim 4, wherein the airflow distribution assembly further comprises several pairs of auxiliary airflow distribution plates (183...188), and the several pairs of auxiliary airflow distribution plates are disposed above the primary airflow distribution plate at a gradually decreasing spacing from bottom to top.
6. The air-conditioner according to claim 5, wherein the areas of the several pairs of auxiliary airflow distribution plates gradually decrease from bottom to top, and the area of the auxiliary airflow distribution plate at the lowest position is smaller than the area of the primary airflow distribution plate.
7. The air-conditioner according to claim 5, wherein among the several pairs of auxiliary airflow distribution plates, the circumferential length of the non-annular heat-exchanged air duct branch between the pair of airflow distribution plates that is located at the top accounts for 1/5 to 1/3 of the total circumferential length of the non-annular heat-exchanged air duct branch.
8. The air-conditioner according to claim 2, wherein the surface of the airflow distribution plates is a curved surface.
9. An air-conditioner according to one of the preceding claims, wherein the air-conditioner body has a front panel (11), a rear panel (12), a left panel and a right panel, the internal air duct of the air-conditioner body being defined by the front panel, the rear panel, the left panel and the right panel, wherein the front panel is provided with the mixed air outlet (111), the rear panel is provided with the non-heat-exchanged air inlet (121) at a position corresponding to the mixed air outlet, and with the mixed air outlet (1016) and the non-heat-exchanged air inlet (1017) of the non-annular cover body of the air-conditioner air supply apparatus being sealed to the mixed air outlet on the front panel and the non-heat-exchanged air inlet on the rear panel, respectively.

Patentansprüche

1. Klimaanlage, umfassend: einen Klimaanlagenkörper

per (1) mit einem Gehäuse, welches einen internen Luftkanal

(15) und einen Radialventilator (17) definiert, einen Verdampfer (16) und eine Klimaanlagen-Luftzufuhrvorrichtung (10), die vom unteren Teil zum oberen Teil des Klimaanlagenkörpers (1) in dem internen Luftkanal (15) angeordnet sind, wobei die Klimaanlagen-Luftzufuhrvorrichtung (10) einen Abdeckungskörper (101) umfasst und wobei der Abdeckungskörper (101) eine vordere Öffnung und eine hintere Öffnung aufweist und ein Durchleitkanal, der den gesamten Abdeckungskörper (101) durchläuft, in der Mitte des Abdeckungskörpers (101) von der vorderen Öffnung bis zu der hinteren Öffnung ausgebildet ist und wobei die vordere Öffnung einen Mischluft-Auslass (111) bildet und die hintere Öffnung einen Nicht-wärmegetauschte-Luft-Einlass (121) bildet und wobei ferner eine Wärmegetauschte-Luft-Hauptkanal (1011) zwischen dem Klimaanlagenkörper (1) und dem hinteren Ende einer Wand des

Abdeckungskörpers (101) ausgebildet ist, wobei es der

Wärmegetauschte-Luft-Hauptkanal (1011) ermöglicht, wärmegetauschte Luft von dem Verdampfer (16) über den internen Luftkanal (15) zu der Klimaanlagen-Luftzufuhrvorrichtung (10) zu blasen,

dadurch gekennzeichnet, dass

der Wärmegetauschte-Luft-Hauptkanal (1011) mit einem Ablenkelement (1012) versehen ist, das den Wärmegetauschte-Luft-Hauptkanal (1011) in eine Mehrzahl von Wärmegetauschte-Luft-Kanalabzweigen (1013) unterteilt, die den internen Luftkanal (15) mit dem Durchleitkanal verbinden, und

eine Luftstrom-Verteilungsanordnung (18) in dem Wärmegetauschte-Luft-Hauptkanal (1011) angeordnet ist, welche dazu dient, wärmegetauschte Luft, die aus dem internen Luftkanal (15) in den Wärmegetauschte-Luft-Hauptkanal (1011) eintritt, umlaufend zu verteilen, indem sie sich in die Wärmegetauschte-Luft-Kanalabzweige (1013) erstreckt, und wobei ferner der Abdeckungskörper (101), der Wärmegetauschte-Luft-Hauptkanal (1011) und die Wärmegetauschte-Luft-Kanalabzweige (1013) eine Form aufweisen, die dem Großteil eines Kreises entspricht, aber nicht ringförmig sind, da sie an einem unteren Teil eine Aussparung aufweisen.

2. Klimaanlage nach Anspruch 1, wobei die Luftstrom-Verteilungsanordnung eine Mehrzahl von Luftstrom-Verteilungsplatten (181...188) umfasst und die Mehrzahl von Luftstrom-Verteilungsplatten bilateral symmetrisch in einer umlaufenden Richtung der nicht ringförmigen Wärmegetauschte-Luft-Kanalabzweige und entlang einer Luftzufuhrrichtung der wärmegetauschten Luft angeordnet sind.

3. Klimaanlage nach Anspruch 2, wobei die Mehrzahl

von Luftstrom-Verteilungsplatten gebogene Verteilungsplatten derselben Biegerichtung sind und die Biegerichtung der Mehrzahl von Luftstrom-Verteilungsplatten entgegengesetzt zu der Luftzufuhrichtung der wärmegetauschten Luft ist.

4. Klimaanlage nach Anspruch 3, wobei die Luftstrom-Verteilungsanordnung zumindest zwei Haupt-Luftstrom-Verteilungsplatten (181, 182) umfasst, welche die wärmegetauschte Luft in einen linken, einen mittleren und einen rechten Teil unterteilen, und die zwei Haupt-Luftstrom-Verteilungsplatten an einem unteren Teil der nicht ringförmigen Wärmegetauschte-Luft-Kanalabzweige angeordnet sind und die nicht ringförmigen Wärmegetauschte-Luft-Kanalabzweige in zwei Teile unterteilen, deren Längen in einem Verhältnis von 1:2 bis 1:4 stehen.
5. Klimaanlage nach Anspruch 4, wobei die Luftstrom-Verteilungsanordnung ferner mehrere Paare von Neben-Luftstrom-Verteilungsplatten (183...188) umfasst und die mehreren Paare von Neben-Luftstrom-Verteilungsplatten oberhalb der Haupt-Luftstrom-Verteilungsplatte mit einem sich von unten nach oben schrittweise verringernden Abstand angeordnet sind.
6. Klimaanlage nach Anspruch 5, wobei sich die Flächen der mehreren Paare von Neben-Luftstrom-Verteilungsplatten von unten nach oben schrittweise verringern und die Fläche der an der untersten Position befindlichen Neben-Luftstrom-Verteilungsplatte kleiner als die Fläche der Haupt-Luftstrom-Verteilungsplatte ist.
7. Klimaanlage nach Anspruch 5, wobei bei den mehreren Paaren von Neben-Luftstrom-Verteilungsplatten die Umfangslänge des nicht ringförmigen Wärmegetauschte-Luft-Kanalabzweigs zwischen dem ganz oben befindlichen Paar von Luftstrom-Verteilungsplatten 1/5 bis 1/3 der gesamten Umfangslänge des nicht ringförmigen Wärmegetauschte-Luft-Kanalabzweigs ausmacht.
8. Klimaanlage nach Anspruch 2, wobei die Oberfläche der Luftstrom-Verteilungsplatten eine gekrümmte Oberfläche ist.
9. Klimaanlage nach einem der vorangegangenen Ansprüche, wobei der Klimaanlagekörper eine Vorderwand (11), eine Rückwand (12), eine linke Wand und eine rechte Wand aufweist und der interne Luftkanal des Klimaanlagekörpers durch die Vorderwand, die Rückwand, die linke Wand und die rechte Wand definiert ist, wobei die Vorderwand mit dem Mischluft-Auslass (111) versehen ist und die Rückwand an einer dem Mischluft-Auslass entsprechenden Stelle mit dem Nicht-wärmegetauschte-Luft-

Einlass (121) versehen ist, und wobei der Mischluft-Auslass (1016) und der Nicht-wärmegetauschte-Luft-Einlass (1017) des nicht ringförmigen Abdeckungskörpers der Klimaanlage-Luftzufuhrvorrichtung jeweils mit dem Mischluft-Auslass auf der Vorderwand bzw. dem Nicht-wärmegetauschte-Luft-Einlass auf der Rückwand abgedichtet verbunden sind.

Revendications

1. Climatiseur, comprenant : un corps de climatiseur (1) avec une carrosserie définissant un conduit d'air intérieur (15) et un ventilateur centrifuge (17), un évaporateur (16) et un appareil d'alimentation en air du climatiseur (10) disposé dans le conduit d'air intérieur (15) du bas au sommet du corps de climatiseur (1), l'appareil d'alimentation en air du climatiseur (10) comprenant un corps de couvercle (101), et le corps de couvercle (101) ayant une ouverture avant et une ouverture arrière et un conduit de traversée s'étendant dans tout le corps de couvercle (101), formé au milieu du corps de couvercle (101) de l'ouverture avant à l'ouverture arrière, et l'ouverture avant formant une sortie d'air mixte (111) et l'ouverture arrière une entrée d'air exempt d'échange thermique (121), et un conduit d'air d'échange thermique principal (1011) étant en outre formé entre le corps de climatiseur (1) et l'extrémité arrière d'une paroi du corps de couvercle (101), le conduit d'air d'échange thermique principal (1011) permettant à l'air d'échange thermique d'être soufflé de l'évaporateur (16) vers l'appareil d'alimentation en air du climatiseur (10) via le conduit d'air intérieur (15), **caractérisé en ce que** le conduit d'air d'échange thermique principal (1011) est pourvu d'un déflecteur (1012) divisant le conduit d'air d'échange thermique principal (1011) en une pluralité de branches (1013) de conduit d'air d'échange thermique faisant communiquer le conduit d'air intérieur (15) avec le conduit de traversée ; et **en ce qu'un** dispositif de distribution de flux d'air (18) est disposé dans le conduit d'air d'échange thermique principal (1011) pour la distribution circonferentielle de l'air d'échange thermique entrant dans le conduit d'air d'échange thermique principal (1011) depuis le conduit d'air intérieur (15), par extension dans les branches (1013) de conduit d'air d'échange thermique ; et le corps de couvercle (101), le conduit d'air d'échange thermique principal (1011) et les branches (1013) de conduit d'air d'échange thermique présentent la forme de la presque totalité d'un cercle tout en n'étant pas annulaires, puisque présentant une échancrure dans une partie inférieure.
2. Climatiseur selon la revendication 1, où le dispositif

de distribution de flux d'air comprend une pluralité de plaques de distribution de flux d'air (181...188), et où la pluralité de plaques de distribution de flux d'air est disposée de manière symétrique bilatéralement dans la direction circonférentielle des branches non annulaires de conduit d'air d'échange thermique, et le long d'une direction d'alimentation de l'air d'échange thermique.

3. Climatiseur selon la revendication 2, où la pluralité de plaques de distribution de flux d'air est constituée de plaques de distribution cintrées dans la même direction de cintrage, et où la direction de cintrage de la pluralité de plaques de distribution de flux d'air est contraire à la direction d'alimentation de l'air d'échange thermique. 10
4. Climatiseur selon la revendication 3, où le dispositif de distribution de flux d'air comprend au moins une paire de plaques de distribution de flux d'air primaires (181, 182) divisant l'air d'échange thermique en parties gauche, centrale et droite, et où la paire de plaques de distribution de flux d'air primaires est disposée dans une partie inférieure des branches non annulaires de conduit d'air d'échange thermique, et divise les branches non annulaires de conduit d'air d'échange thermique en deux parties dont les longueurs ont un rapport de 1:2 à 1:4. 20 25
5. Climatiseur selon la revendication 4, où le dispositif de distribution de flux d'air comprend en outre plusieurs paires de plaques de distribution de flux d'air auxiliaires (183...188), et où les plusieurs paires de plaques de distribution de flux d'air auxiliaires sont disposées au-dessus de la plaque de distribution de flux d'air primaire à intervalle graduellement décroissant du bas vers le haut. 30 35
6. Climatiseur selon la revendication 5, où les surfaces des plusieurs paires de plaques de distribution de flux d'air auxiliaires décroissent graduellement du bas vers le haut, et où la surface de la plaque de distribution de flux d'air auxiliaire en position la plus basse est inférieure à la surface de la plaque de distribution de flux d'air primaire. 40 45
7. Climatiseur selon la revendication 5, où, parmi les plusieurs paires de plaques de distribution de flux d'air auxiliaires, la longueur circonférentielle de la branche non annulaire de conduit d'air d'échange thermique entre la paire de plaques de distribution de flux d'air située au sommet représente entre 1/5 et 1/3 de la longueur circonférentielle totale de la branche non annulaire de conduit d'air d'échange thermique. 50 55
8. Climatiseur selon la revendication 2, où la surface des plaques de distribution de flux d'air est une sur-

face courbe.

9. Climatiseur selon l'une des revendications précédentes, où le corps de climatiseur a un panneau avant (11), un panneau arrière (12), un panneau gauche et un panneau droit, le conduit d'air intérieur du corps de climatiseur étant défini par le panneau avant, le panneau arrière, le panneau gauche et le panneau droit, le panneau avant étant doté d'une sortie d'air mixte (111), le panneau arrière étant doté de l'entrée d'air exempt d'échange thermique (121) à un emplacement correspondant à la sortie d'air mixte, et la sortie d'air mixte (1016) et l'entrée d'air exempt d'échange thermique (1017) du corps de couvercle non annulaire de l'appareil d'alimentation en air du climatiseur étant respectivement accolées à la sortie d'air mixte sur le panneau avant et à l'entrée d'air exempt d'échange thermique sur le panneau arrière.

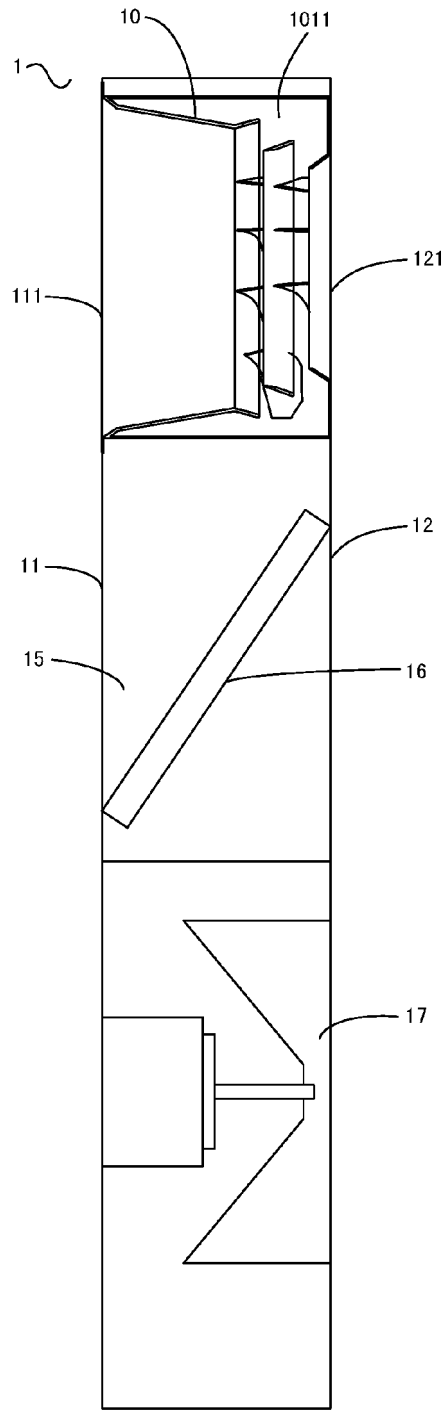


FIG. 1

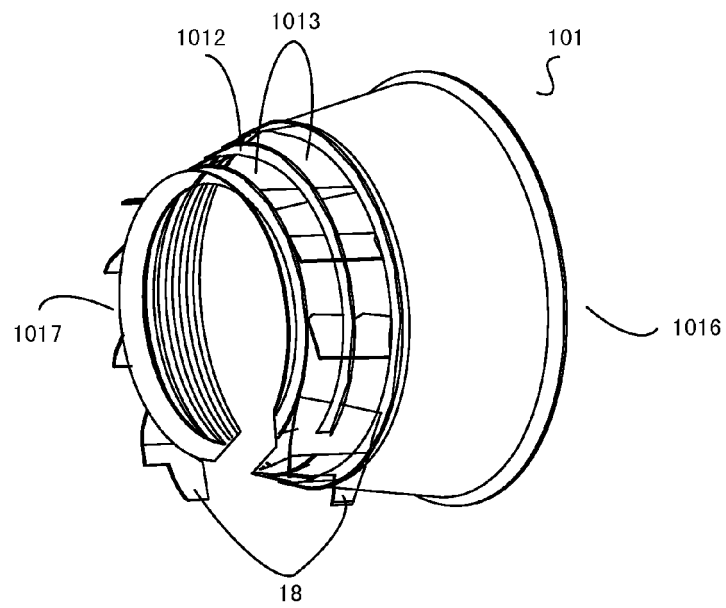


FIG. 2

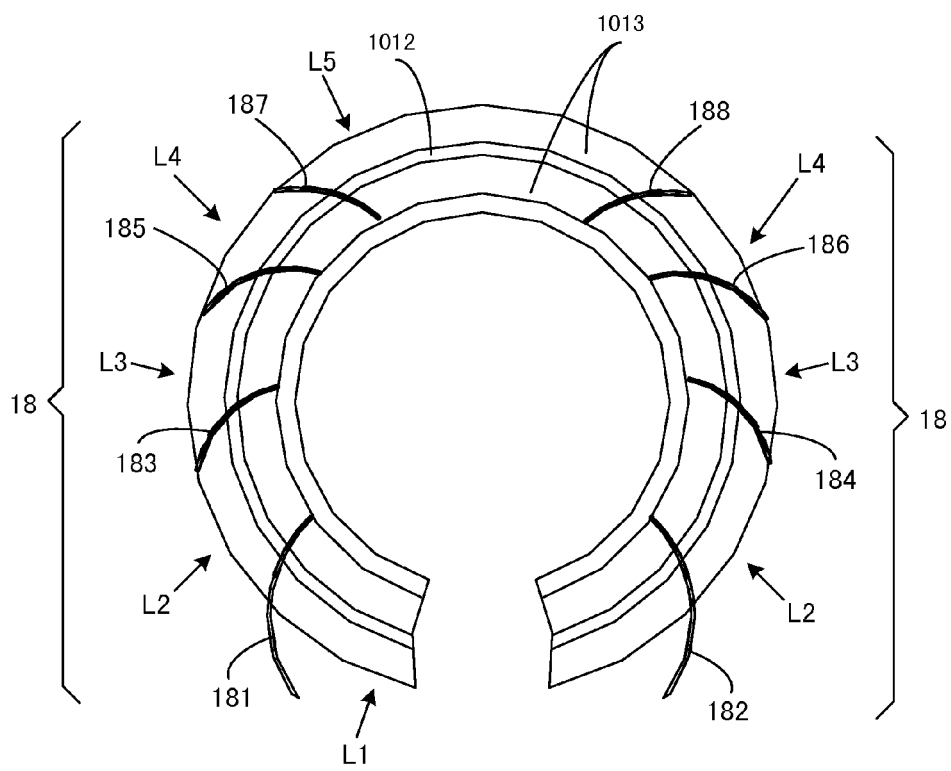


FIG. 3

REFERENCES CITED IN THE DESCRIPTION

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