



(11) **EP 3 896 287 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention  
of the grant of the patent:  
**13.07.2022 Bulletin 2022/28**

(51) International Patent Classification (IPC):  
**F04D 19/00** <sup>(2006.01)</sup> **F04D 25/08** <sup>(2006.01)</sup>  
**F04D 29/52** <sup>(2006.01)</sup> **F04D 29/54** <sup>(2006.01)</sup>  
**F04D 29/58** <sup>(2006.01)</sup> **F24H 3/04** <sup>(2022.01)</sup>

(21) Application number: **20187120.9**

(52) Cooperative Patent Classification (CPC):  
**F04D 25/08; F04D 19/002; F04D 29/524;**  
**F04D 29/547; F04D 29/582**

(22) Date of filing: **22.07.2020**

(54) **CHANNEL-VARIABLE COOLING AND HEATING CIRCULATINGFAN**

KANALVARIABLES KÜHL- UND HEIZZIRKULATIONSGEBLÄSE

VENTILATEUR DE CIRCULATION À CANAL VARIABLE POUR LE REFROIDISSEMENT ET LE  
CHAUFFAGE

(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**

(30) Priority: **14.04.2020 CN 202010292183**

(43) Date of publication of application:  
**20.10.2021 Bulletin 2021/42**

(73) Proprietor: **Shenzhen Lianchuang Technology**  
**Group Co., Ltd**  
**Shenzhen City, Guangdong 518112 (CN)**

(72) Inventors:  
• **LAI, Ban Lai**  
**Longgang District, Shenzhen City, Guangdong**  
**Province, Guangdong 518112 (CN)**  
• **PANG, Ya Peng**  
**Longgang District, Shenzhen City, Guangdong**  
**Province, Guangdong 518112 (CN)**

(74) Representative: **Keil & Schaaflhausen**  
**Patentanwälte PartGmbB**  
**Friedrichstraße 2-6**  
**60323 Frankfurt am Main (DE)**

(56) References cited:  
**CN-U- 206 903 897 JP-U- S52 110 752**  
**JP-Y1- S4 823 148 KR-B1- 101 186 614**

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

## Description

### Technical field

**[0001]** The invention relates to the technical field of air conditioning, in particular to a channel-variable cooling and heating circulating fan.

### Background of the Invention

**[0002]** Heater or fan is necessary electric appliance in modern home. At present available product on the market either is a single heater, or is a single fan. There is a lack of products that have both the heating function of a heater and the blowing function of a fan, especially lack of cooling and heating circulating fan. Cooling and heating circulating fan can be used as a heater, also as a fan, so it is a multi-purpose machine with both cooling and heating functions. Since the cooling and heating circulating fan always has a fixed product structure, blades of an axial fan suck air from the radial direction and the axial direction simultaneously, and the air intake volume is large. When a warm wind is needed, the hot wind blown out is also mixed with cold wind, resulting in poor body feeling especially around the entire wind outlet net.

**[0003]** For example, Chinese patent literature CN 206903897 discloses a dual electric natural wind/warm air circulation fan. When used as a heater, the radial air intake does not pass through the heating body. Therefore, the hot air blown out is obviously mixed with cold air, with a strong wind force, which gives the user an unsatisfactory body feeling. In order to improve the heating problems of axial flow blades in cooling and heating circulating fans, it is urgent to optimize the structure of existing cooling and heating circulating fans, so as to satisfy people's comfort in heating without affecting the cold air volume.

### Summary of the Invention

**[0004]** The objective of the present invention is to solve the technical problems that hot air supply by existing axial flow cooling and heating circulating fans is large in air volume and is mixed with cold air which causes unsatisfactory body feeling. Therefore, the present invention provides a channel-variable cooling and heating circulating fan, which can realize the adjustment of the cooling air volume, and can well improve the body feeling during heating.

**[0005]** In order to achieve the above objective, the present invention provides a channel-variable cooling and heating circulating fan as defined in claim 1.

**[0006]** In some further embodiments, the annular windshield ring is an annular housing of a cylindrical shape, which is sleeved outside or inside the rear net cover and forms a slidable connection with the rear net cover in the axial direction.

**[0007]** In some embodiments, the rear net cover is pro-

vided with a guide groove or guide rib arranged axially, the annular windshield ring is provided with a corresponding guide rib or guide groove on the housing thereof, and the annular windshield ring is slidable with respect to the rear net cover along the axial direction.

**[0008]** In some embodiments, the heating component comprises a heating support and a heating body, wherein an axial air channel is formed inside the heating support and is airtight in a circumferential direction, and wherein the heating body is fixed inside the axial air channel of the heating support, and the heating support forms a detachable fixing connection with the rear net cover, and wind generated by the fan blade blows through the axial air channel and the heating body into the sealed annular air channel and flows out therefrom.

**[0009]** Preferably, the annular windshield ring is arranged inside the heating support, and is provided with an switch handle thereon radially extending out through an axial elongated hole of the heating support and extending out of an outer side of the rear net cover; the annular windshield ring is driven to move along an inner side of the heating support by axially moving the switch handle, thereby gradually closing or opening the radial air intake channel on the rear net cover.

**[0010]** Preferably, the axial air channel is a tapered air channel with a ventilation cross-section size which decreases gradually in a direction towards the fan blade.

**[0011]** Preferably, the radial air intake channel consists of a plurality rows of grids or air holes axially arranged on the rear net cover.

**[0012]** In some embodiments, a front net is further provided in front of the rear net cover and forms a detachable fixed connection with the sealed annular air channel.

**[0013]** In some embodiments, the cooling and heating circulating fan is also provided with a base which is in a rotary connection with the outer side of the rear net cover.

**[0014]** The present invention has the following advantages:

**A.** In the present invention, an annular windshield ring is provided on the radial air intake channel of the rear net cover. The annular windshield ring is capable of axially moving, thereby controlling the opening and closing of the radial air intake channel, realizing switch between cold air and warm air, thus avoiding mixing of cold air in warm air and effectively improving the user's body feeling. Meanwhile, in the case of cold air, the annular windshield ring can also be used to adjust the air inlet size of the radial air inlet channel, so that the air intake volume of the radial cold air can be adjusted and the total amount of air output can be controlled, and thus the user experience can be better.

**B.** In one embodiment of the present invention, the axial air channel is a tapered air channel, so that surrounding air can be effectively collected to form an intake air flow, and the intake air flow can be blown out intensively and evenly, thus the blowing feeling

is stronger. Such structure is simple and novel. The axial moving of the annular windshield ring can realize the opening and closing control of the radial air intake channel, so that the radial air intake volume can be well controlled without reducing the air intake volume in the axial air channel, thus users get more moderate experience when heating.

**C.** In one embodiment of the present invention, the annular windshield ring works together with the tapered axial air channel to fully optimize the performance of the product under the condition of warm air on the one hand and also rapidly heat up the environment within a certain space and shorten the heating time on the other hand, so that users can get warmth in the shortest time and thus get more comfortable experience.

### Brief Description of the Drawings

**[0015]** In order to make the contents of the invention easier to be clearly understood, the present invention is further described according to the appended drawings. It should be understood that the appended drawings described below show some embodiments of the present invention.

**[0016]** Brief description of the drawings are as below:

Figure 1 is a three-dimensional diagram of a cooling and heating circulating fan provided by the present invention;

Figure 2 is a three-dimensional diagram showing an exploded view of the body in Figure 1.

Figure 3 is a three-dimensional diagram of the annular windshield ring in Figure 1.

Figure 4 is a sectional view of a local area when both radial and axial intake air are allowed (showing a schematic diagram of air flow when the annular windshield ring is in an opening state);

Figure 5 is a sectional view of a local area when the axial intake air is allowed but the radial air intake channel is closed (showing a schematic diagram of air flow when the annular windshield ring is in a closing state);

Figure 6 is a schematic diagram of cold wind state when the annular windshield ring is in an opening state;

Figure 7 is a schematic diagram of warm wind state when the annular windshield ring is in a closing state.

**[0017]** Reference numbers:

- 1- Body;
- 11 - Rear net cover;
- 111- Radial air intake channel;
- 112- Sealed annular air channel;
- 113- Intake air grids;
- 12- Drive device;
- 121- Motor, 122- Motor cover;

- 13- Heating component;
- 131- Heating support;
- 132- Heating body;
- 14- Fan blade;
- 15- Annular windshield ring;
- 16- Switch handle;
- 17- Front net;
- 2-Base;
- a- Axial air channel;
- b- Axial elongated hole;
- c- Guide groove or guide rib.

### Detailed Description of Embodiments

**[0018]** The present invention will be described clearly and completely in combination with the appended drawings. Obviously, the described embodiments are just some of the embodiments of the invention rather than all of the embodiments. Based on the embodiments of the invention, all other embodiments obtained by those skilled in the art which fall within the wording of at least claim 1, also fall within the protection scope of the present invention.

**[0019]** As shown in Figure 1 and Figure 2, the present invention provides a channel-variable cooling and heating circulating fan, generally comprising a body 1 and a base 2. The body 1 comprises a rear net cover 11, a drive device 12, a heating component 13, a fan blade 14 and front net 17. The front net 17 forms a detachable fixed connection with a sealed annular air channel 112, for providing safety protection and allowing output of wind. The drive device 12 and the heating component 13 are arranged inside the rear net cover 11. The drive device 12 has a rotatable shaft going through the heating component 13 to connect to the fan blade 14. The rear net cover 11 is provided with a radial air intake channel 111 of an annular shape thereon between the fan blade 14 and the heating component 13, and a sealed annular air channel 112 is formed on a front end of the rear net cover 11. For example, the sealed annular air channel 112 is a cylindrical housing formed by looping a plate without holes into a ring. The rear net cover 11 is of gridded structure, and a closed air intake grid 113 is formed at the rear end thereof. Motor 121 is installed at the bottom of the inner cavity of the rear net cover 11. Motor cover 122 covers the motor 121 and is fixed together with the rear net cover 11. The sealed annular air channel 112 and the radial air intake channel 111 are connected coaxially and successively. The radial air intake channel 111 is provided with an annular windshield ring 15. The annular windshield ring 15 has an axial size greater than or equal to an axial size of the radial air intake channel 111, and is capable of axially moving into and out of a position where the radial air intake channel 111 is located. When the annular windshield ring 15 is moved into the entire position of the radial air intake channel 111, the radial air intake channel 111 will be completely blocked, realizing the closing of the radial air intake channel 111, thereby

preventing outside air from entering into the sealed annular air channel 112 through the radial air intake channel 111. Of course, when the annular windshield ring 15 is moved out of the position of the radial air intake channel 111, the radial air intake channel 111 will be opened. Therefore, when heating mode is required, the user can choose to move the annular windshield ring 15 into the position of the radial air intake channel 111 to completely cover the radial air intake channel 111, thus blocking intake of radial wind. Axial wind produced by the rotating of the fan blade enters through intake air grids 113 at the rear end of the rear net cover 11 and blows through the heating component, so that the hot wind blown out does not comprise cold wind. Of course, when warm air is not needed, the user can adjust the position of the annular windshield ring 15 according to specific conditions, thus the user can control the air volume by completely or partially opening the radial air intake channel according to personal preference.

**[0020]** As shown in Figure 4, the annular windshield ring 15 is arranged movably in a position between the sealed annular air channel 112 and the heating component 13, i.e. the position of the axial direction air intake channel 111 as shown in Figure 3. The annular windshield ring 15 is of a size that can completely cover the radial air intake channel 111. Herein the term "size" includes area, diameter, dimensions and shape, etc. The purpose is that it can close the radial air intake channel 111. Preferably, the annular windshield ring 15 adopted in the present invention is an annular housing of a cylindrical shape, which is sleeved outside or inside the rear net cover 11 and forms a slidable connection with the rear net cover 11 in the axial direction. Preferably, the annular windshield ring 15 is arranged inside the rear net cover 11 in the present invention.

**[0021]** The rear net cover 11 is provided with a guide groove or guide rib arranged axially thereon, and the annular windshield ring 15 is provided with a corresponding guide rib or guide groove "c" on the housing thereof, so that the guide groove or guide rib on the rear net cover 11 can engage with the guide rib or guide groove on the annular windshield ring 15, and the annular windshield ring 15 is slidable with respect to the rear net cover 11 along the axial direction to realize the opening and closing of the radial air intake channel 111. Of course, the guide features can also be arranged on the heating support 131 and the annular windshield ring 15. For example, two or more guide features such as concave or convex can be provided on the annular windshield ring 15, and the heating support 131 can be provided with corresponding guide features thereon which can match with the guide features on the annular windshield ring 15. The specific matching section and shape of the guide features are not limited in the present invention. The guide features are given for schematically showing but not limiting the present invention. Other features or ways with guiding effect can also be used in the present invention. The purpose of the guide is to allow the annular wind-

shield ring 15 to slide back and forth more smoothly, preventing the annular windshield ring 15 from rotating in a circular direction.

**[0022]** As shown in Figure 2, the heating component 13 comprises a heating support 131 and a heating body 132. An axial air channel "a" is formed inside the heating support 131 and is airtight in a circumferential direction. As shown in Figure 6, the heating body 132 is fixed inside the axial air channel "a" of the heating support 131, and the heating support 131 forms a detachable fixed connection with the rear net cover 11, so that wind generated by the fan blade 14 passes through intake air grids 113 and blows through the axial air channel "a" and the heating body 132 into the sealed annular air channel 112 and flows out therefrom. The heating body 132 adopted here are those existing in prior art, so its structural characteristics will not be described here.

**[0023]** In one embodiment, the annular windshield ring 15 is arranged inside the heating support 131, and is provided with a switch handle 16 thereon. The switch handle 16 radially extends out through an axial elongated hole "b" of the heating support 131 and extends out of an outer side of the rear net cover 11. The annular windshield ring 15 is driven to move along a side of the heating support 131 by axially moving the switch handle 16, thereby gradually closing or opening the radial air intake channel 111 on the rear net cover 11. Preferably, the switch handle 16 is fixed to an edge of the annular windshield ring 15. One or more switch handles 16 can be provided. There is no restriction to the number of the switch handles. The annular windshield ring 15 and the switch handle 16 may be integrated as a whole or may be separate parts, which is not restricted in the present invention. The purpose of the switch handle is just for easy operation to help moving the annular windshield ring 15.

**[0024]** As shown in Figures 6 and 7, the structure of the heating support 131 shows that an inner side of the heating support 131 forms an axial air channel "a" which is tapered in shape and has a ventilation cross-section size decreasing gradually in a direction towards the fan blade 14, so that surrounding air can be effectively collected to form an intake air flow, and the user experience can be better.

**[0025]** Herein the radial air intake channel 111 consists of a plurality of rows of grids or air holes axially arranged on the rear net cover 11. The mesh size of the grids or air holes on the rear net cover 11 is not specifically restricted.

**[0026]** The outer side of the rear net cover 11 forms a rotary connection with the base 2. The structure of the base 2 is known in prior art, so it will not be described here.

**[0027]** As shown in Figure 2, the motor 121 and its shaft, front net 17, rear net cover 11 and fan blade 14 in the present invention are coaxial along a central axis; In particular, the rear net cover 11, heating support 131 and sealed annular air channel 112 are coaxial along a central axis.

**[0028]** The annular windshield ring 15 is movable or sl-

idable back and forth along the central axis with the assistance of the guide groove or guide rib under the action of the switch handle 16, thereby closing or opening the radial air intake channel 111 and adjusting the volume of the radial intake air. Of course, the annular windshield ring 15 can be manually driven or automatically driven. When the annular windshield ring 15 is automatically driven, the automatic drive device can be composed of transmission structure and motor drive. For example, an electric push rod can be adopted to drive the annular windshield ring 15 to move back and forth, which is not specifically described here.

**[0029]** As shown in Figures 5 and 7, when warm air is needed, the annular windshield ring 15 can be manually driven to move to close the radial air intake channel 111, thereby reducing the air intake area and air intake volume and realizing axial air intake only, so that the wind coming out of the front net 17 is warmer and more uniform.

**[0030]** As shown in Figures 4 and 6, the annular windshield ring 15 can be manually driven to move to open the radial air intake channel 111, thus realizing the simultaneous radial and axial air intake in both directions, and thus increasing the air intake area and air intake volume, so that the wind coming out of the front net 17 is stronger and cooler.

**[0031]** As described above, the processes of opening and closing the radial air intake channel are the two most basic states of the implementation of the present invention. Of course, it is also possible to choose any real-time state between these two states to adjust the volume of the radial intake air. The opening size and closing size of the radial air intake channel depends on the actual demand of product design. The manual and automatic opening and closing modes also depend on the positioning of the product, which are not restricted or described herein.

**[0032]** It is to be understood that the above-described embodiments are merely given for clearly illustrating but not limiting the embodiments. It will be apparent to one of ordinary skill in the art that other different forms of changes or variations can be made on the basis of the above description. It is to be understood that various changes or modifications may be made herein without departing from the scope of the invention as defined by the appended claims.

## Claims

1. A channel-variable cooling and heating circulating fan, comprising a rear net cover (11), a drive device (12), a heating component (13) and a fan blade (14), wherein the drive device (12) and the heating component (13) are arranged inside the rear net cover (11), and the drive device (12) has a rotatable shaft going through the heating component (13) to connect to the fan blade (14); a sealed annular air channel (112) is formed on a front end of the rear net cover

(11) and intake grids (113) are formed on a rear end of the rear net cover (11) and by the rotating of the fan blade (14), an axial wind is produced which enters through the intake air grids (113), blows through the heating component (13) and into the sealed annular air channel (112) and flows out therefrom; the rear net cover (11) is provided with a radial air intake channel of an annular shape thereon, the sealed annular air channel (112) communicates with the radial air intake channel (111), and the radial air intake channel (111) is provided with an annular windshield ring (15);

**characterized in that**, the radial air intake channel is provided between the fan blade (14) and the heating component (13), and the annular windshield ring (15) has an axial size greater than or equal to an axial size of the radial air intake channel (111), and is capable of axially moving into and out of a position where the radial air intake channel (111) is located, thereby controlling the opening and closing of the radial air intake channel (111).

2. The channel-variable cooling and heating circulating fan according to claim 1, wherein the annular windshield ring (15) is an annular housing of a cylindrical shape, which is sleeved outside or inside the rear net cover (11) and forms a slidable connection with the rear net cover (11) in the axial direction.
3. The channel-variable cooling and heating circulating fan according to claim 2, wherein the rear net cover (11) is provided with a guide groove or guide rib arranged axially thereon, the annular windshield ring (15) is provided with a corresponding guide rib or guide groove on the housing thereof, and the annular windshield ring (15) is slidable with respect to the rear net cover (11) along the axial direction.
4. The channel-variable cooling and heating circulating fan according to claim 1, wherein the heating component (13) comprises a heating support (131) and a heating body (132), wherein an axial air channel (a) is formed inside the heating support (131) and is airtight in a circumferential direction, and wherein the heating body (132) is fixed inside the axial air channel (a) of the heating support (131), and the heating support (131) forms a detachable fixing connection with the rear net cover (11), and wind generated by the fan blade (14) blows through the axial air channel (a) and the heating body (132) into the sealed annular air channel (112) and flows out therefrom.
5. The channel-variable cooling and heating circulating fan according to claim 4, wherein, the annular windshield ring (15) is arranged inside the heating support (131), and is provided with a switch handle (16) thereon radially extending out through an axial elongated

hole (b) of the heating support (131) and extending out of an outer side of the rear net cover (11); the annular windshield ring (15) is driven to move along an inner side of the heating support (131) by axially moving the switch handle (16), thereby gradually closing or opening the radial air intake channel (111) on the rear net cover (11).

6. The channel-variable cooling and heating circulating fan according to claim 5, wherein the axial air channel (a) is a tapered air channel with a ventilation cross-section size which decreases gradually in a direction towards the fan blade (14).
7. The channel-variable cooling and heating circulating fan according to any one of claims 1-6, wherein the radial air intake channel (111) consists of a plurality rows of grids or air holes axially arranged on the rear net cover (11).
8. The channel-variable cooling and heating circulating fan according to claim 7, wherein a front net (17) is further provided in front of the rear net cover (11) and forms a detachable fixed connection with the sealed annular air channel (112).
9. The channel-variable cooling and heating circulating fan according to claim 1, wherein the cooling and heating circulating fan is also provided with a base (2) which is in a rotary connection with the outer side of the rear net cover (11).

#### Patentansprüche

1. Kanalvariabler Kühl- und Heizumwälzventilator, umfassend eine hintere Netzabdeckung (11), eine Antriebsvorrichtung (12), eine Heizkomponente (13) und einen Ventilatorflügel (14),

wobei die Antriebsvorrichtung (12) und die Heizkomponente (13) im Inneren der hinteren Netzabdeckung (11) angeordnet sind und die Antriebsvorrichtung (12) eine Drehwelle aufweist, die durch die Heizkomponente (13) verläuft, um den Ventilatorflügel (14) zu verbinden;

wobei ein abgedichteter ringförmiger Luftkanal (112) auf einem vorderen Ende der hinteren Netzabdeckung (11) gebildet ist und Ansauggitter (113) auf einem hinteren Ende der hinteren Netzabdeckung (11) gebildet sind und durch das Drehen des Ventilatorflügels (14) ein axialer Wind erzeugt wird, der durch die Ansaugluftgitter (113) eintritt, durch die Heizkomponente (13) und in den abgedichteten ringförmigen Luftkanal (112) bläst und daraus ausströmt; wobei die hintere Netzabdeckung (11) mit einem radialen Luftansaugkanal in Ringform darauf

vorgesehen ist, wobei der abgedichtete ringförmige Luftkanal (112) mit dem radialen Luftansaugkanal (111) kommuniziert, und wobei der radiale Luftansaugkanal (111) mit einem ringförmigen Windschutzring (15) vorgesehen ist;

**dadurch gekennzeichnet, dass**

der radiale Luftansaugkanal zwischen dem Ventilatorflügel (14) und der Heizkomponente (13) vorgesehen ist, und

der ringförmige Windschutzring (15) eine axiale Größe aufweist, die größer oder gleich einer axialen Größe des radialen Luftansaugkanals (111) ist, und in der Lage ist, sich axial in eine und aus einer Position zu bewegen, in welcher sich der radiale Luftansaugkanal (111) befindet, wodurch das Öffnen und Schließen des radialen Luftansaugkanals (111) gesteuert wird.

2. Kanalvariabler Kühl- und Heizumwälzventilator nach Anspruch 1, wobei der ringförmige Windschutz (15) ein ringförmiges Gehäuse in zylindrischer Form ist, das die hintere Netzabdeckung (11) von außen oder innen umhüllt und eine Schieberverbindung mit der hinteren Netzabdeckung (11) in der axialen Richtung bildet.

3. Kanalvariabler Kühl- und Heizumwälzventilator nach Anspruch 2, wobei die hintere Netzabdeckung (11) mit einer Führungsnut oder Führungsrippe vorgesehen ist, die axial darauf angeordnet ist, wobei der ringförmige Windschutzring (15) mit einer entsprechenden Führungsrippe oder Führungsnut auf dem Gehäuse davon vorgesehen ist und der ringförmige Windschutzring (15) in Bezug auf die hintere Netzabdeckung (11) entlang der axialen Richtung verschiebbar ist.

4. Kanalvariabler Kühl- und Heizumwälzventilator nach Anspruch 1,

wobei die Heizkomponente (13) einen Heizträger (131) und einen Heizkörper (132) umfasst, wobei ein axialer Luftkanal (a) im Inneren des Heizträgers (131) gebildet ist und in einer Umfangsrichtung luftdicht ist, und wobei der Heizkörper (132) im Inneren des axialen Luftkanals (a) des Heizträgers (131) befestigt ist und der Heizträger (131) eine abnehmbare feste Verbindung mit der hinteren Netzabdeckung (11) bildet und ein durch den Ventilatorflügel (14) erzeugter Wind durch den axialen Luftkanal (a) und den Heizkörper (132) in den abgedichteten ringförmigen Luftkanal (112) bläst und daraus ausströmt.

5. Kanalvariabler Kühl- und Heizumwälzventilator nach Anspruch 4,

wobei der ringförmige Windschutzring (15) im Inneren des Heizträgers (131) angeordnet ist und mit einem Schaltgriff (16) darauf vorgesehen ist, der sich radial durch ein axiales längliches Loch (b) des Heizträgers (131) heraus erstreckt und der sich aus einer Außenseite der hinteren Netzabdeckung (11) heraus erstreckt; wobei der ringförmige Windschutzring (15) angetrieben wird, um sich entlang einer Innenseite des Heizträgers (131) zu bewegen, indem er den Schaltgriff (16) axial bewegt, wodurch der radiale Luftansaugkanal (111) auf der hinteren Netzabdeckung (11) graduell geschlossen oder geöffnet wird.

6. Kanalvariabler Kühl- und Heizumwälzventilator nach Anspruch 5, wobei der axiale Luftkanal (a) einen sich verjüngenden Luftkanal mit einer Belüftungsquerschnittsgröße ist, die in einer Richtung hin zu dem Ventilatorflügel (14) graduell abnimmt.

7. Kanalvariabler Kühl- und Heizumwälzventilator nach einem der Ansprüche 1-6, wobei der radiale Luftansaugkanal (111) aus mehreren Reihen von Gittern oder Luftlöchern besteht, die axial auf der hinteren Netzabdeckung (11) angeordnet sind.

8. Kanalvariabler Kühl- und Heizumwälzventilator nach Anspruch 7, wobei ferner ein vorderes Netz (17) vor der hinteren Netzabdeckung (11) vorgesehen ist und eine abnehmbare feste Verbindung mit dem abgedichteten ringförmigen Luftkanal (112) bildet.

9. Kanalvariabler Kühl- und Heizumwälzventilator nach Anspruch 1, wobei der Kühl- und Heizumwälzventilator auch mit einer Basis (2) vorgesehen ist, die mit der Außenseite der hinteren Netzabdeckung (11) in Drehverbindung steht.

## Revendications

1. Ventilateur de circulation à canal variable pour le refroidissement et le chauffage, comprenant un couvercle maillé arrière (11), un dispositif d'entraînement (12), un composant de chauffage (13) et une pale de ventilateur (14),

dans lequel le dispositif d'entraînement (12) et le composant de chauffage (13) sont disposés à l'intérieur du couvercle maillé arrière (11), et le dispositif d'entraînement (12) comporte un arbre rotatif traversant le composant de chauffage (13) pour se raccorder à la pale de ventilateur

(14) ;

un canal d'air annulaire scellé (112) est formé au niveau d'une extrémité avant du couvercle maillé arrière (11) et des grilles d'admission (113) sont formées au niveau d'une extrémité arrière du couvercle maillé arrière (11) et la rotation de la pale de ventilateur (14) permet de produire un vent axial, lequel entre par les grilles d'air d'admission (113), souffle à travers le composant de chauffage (13) et dans le canal d'air annulaire scellé (112) et sort de celui-ci ;

le couvercle maillé arrière (11) est doté d'un canal d'admission d'air radial de forme annulaire sur celui-ci, le canal d'air annulaire scellé (112) communique avec le canal d'admission d'air radial (111), et le canal d'admission d'air radial (111) est doté d'une bague de pare-vent annulaire (15) ;

### caractérisé en ce que

le canal d'admission d'air radial est disposé entre la pale de ventilateur (14) et le composant de chauffage (13), et

la bague de pare-vent annulaire (15) présente une taille axiale supérieure ou égale à une taille axiale du canal d'admission d'air radial (111), et est capable de se déplacer axialement dans et hors d'une position où se trouve le canal d'admission d'air radial (111), commandant ainsi l'ouverture et la fermeture du canal d'admission d'air radial (111).

2. Ventilateur de circulation à canal variable pour le refroidissement et le chauffage selon la revendication 1, dans lequel la bague de pare-vent annulaire (15) est un logement annulaire de forme cylindrique, lequel est emmanché à l'extérieur ou à l'intérieur du couvercle maillé arrière (11) et forme un raccord coulissant avec le couvercle maillé arrière (11) dans la direction axiale.

3. Ventilateur de circulation à canal variable pour le refroidissement et le chauffage selon la revendication 2, dans lequel le couvercle maillé arrière (11) est doté d'une rainure de guidage ou d'une nervure de guidage disposée axialement sur celui-ci, la bague de pare-vent annulaire (15) est dotée d'une rainure de guidage ou d'une nervure de guidage correspondante sur le logement de celle-ci, et la bague de pare-vent annulaire (15) peut coulisser par rapport au couvercle maillé arrière (11) le long de la direction axiale.

4. Ventilateur de circulation à canal variable pour le refroidissement et le chauffage selon la revendication 1,

dans lequel le composant de chauffage (13) comprend un support de chauffage (131) et un

- corps de chauffage (132),  
 dans lequel un canal d'air axial (a) est formé à  
 l'intérieur du support de chauffage (131) et est  
 hermétique dans une direction circonférentielle,  
 et  
 dans lequel le corps de chauffage (132) est fixé  
 à l'intérieur du canal d'air axial (a) du support de  
 chauffage (131), et le support de chauffage  
 (131) forme un raccord de fixation détachable  
 avec le couvercle maillé arrière (11), et du vent  
 généré par la pale de ventilateur (14) souffle à  
 travers le canal d'air axial (a) et le corps de  
 chauffage (132) dans le canal d'air annulaire  
 scellé (112) et sort de celui-ci.
5. Ventilateur de circulation à canal variable pour le re-  
 froidissement et le chauffage selon la revendication  
 4,  
 dans lequel la bague de pare-vent annulaire (15)  
 est disposée à l'intérieur du support de chauf-  
 fage (131) et dotée d'une manette de commutation  
 (16) sur celle-ci, laquelle s'étend radialement  
 vers l'extérieur à travers un trou oblong axial (b)  
 du support de chauffage (131) et s'étendant hors  
 d'un côté extérieur du couvercle maillé arrière  
 (11) ;  
 la bague de pare-vent annulaire (15) est entraî-  
 née de manière à se déplacer le long d'un côté  
 intérieur du support de chauffage (131) par un  
 déplacement axial de la manette de commuta-  
 tion (16), fermant ou ouvrant ainsi progressive-  
 ment le canal d'admission d'air radial (111) sur  
 le couvercle maillé arrière (11).
6. Ventilateur de circulation à canal variable pour le re-  
 froidissement et le chauffage selon la revendication  
 5,  
 dans lequel le canal d'air axial (a) est un canal d'air  
 conique avec une dimension de section transversale  
 de ventilation diminuant progressivement dans une  
 direction vers la pale de ventilateur (14).
7. Ventilateur de circulation à canal variable pour le re-  
 froidissement et le chauffage selon l'une quelconque  
 des revendications 1 à 6,  
 dans lequel le canal d'admission d'air radial (111)  
 consiste en une pluralité de rangées de grilles ou de  
 trous d'air disposés sur le couvercle maillé arrière  
 (11) .
8. Ventilateur de circulation à canal variable pour le re-  
 froidissement et le chauffage selon la revendication  
 7,  
 dans lequel un maillage avant (17) est en outre dis-  
 posé devant le couvercle maillé arrière (11) et forme  
 un raccord fixe détachable avec le canal d'air annu-  
 laire scellé (112).
9. Ventilateur de circulation à canal variable pour le re-  
 froidissement et le chauffage selon la revendication  
 1,  
 dans lequel le ventilateur de circulation à canal va-  
 riable pour le refroidissement et le chauffage est éga-  
 lement doté d'une base (2), laquelle est raccordée  
 de façon rotative au côté extérieur du couvercle  
 maillé arrière (11).



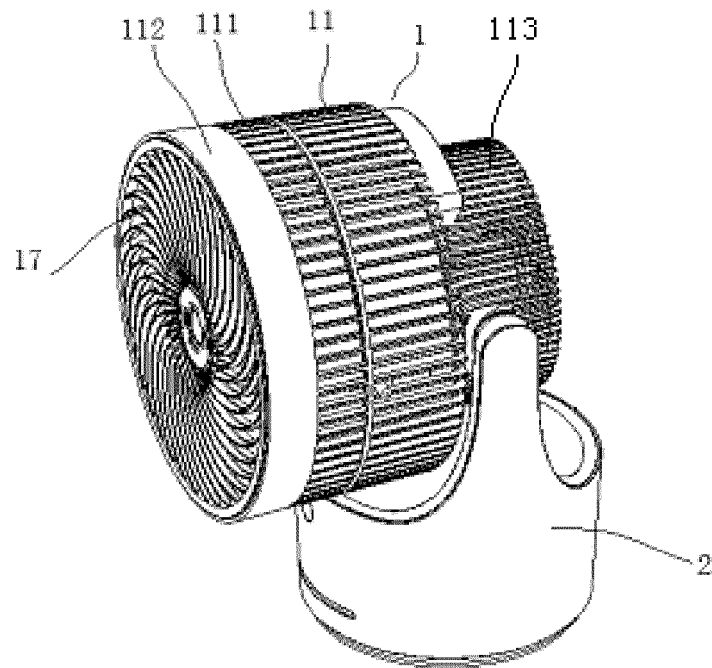


Figure 1

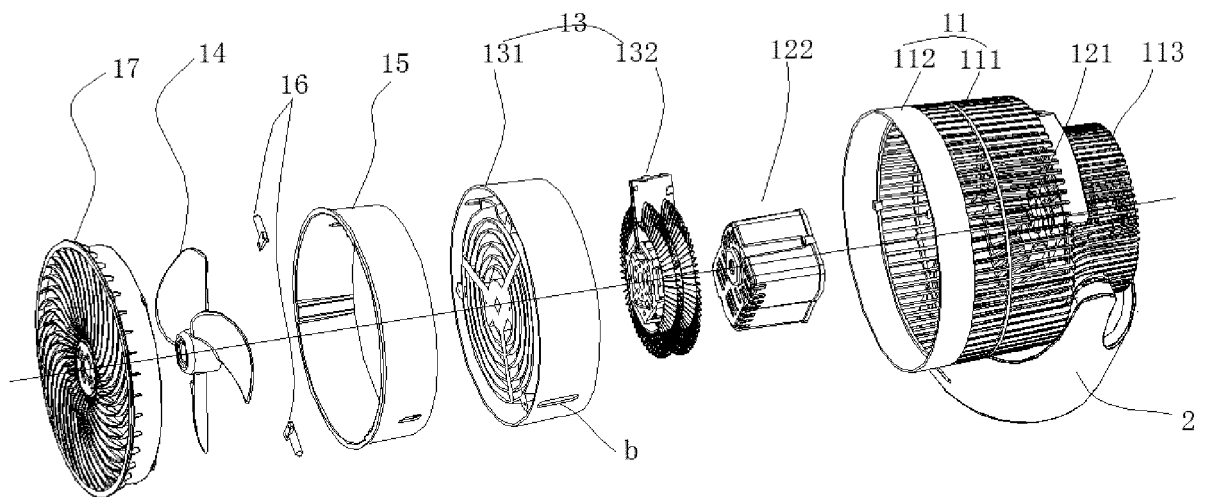


Figure 2

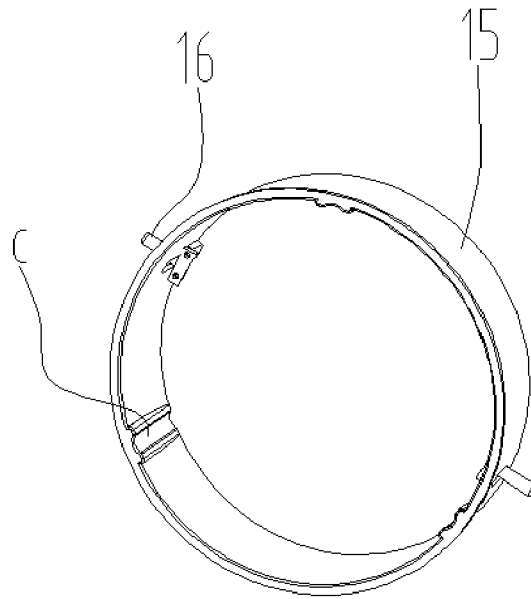


Figure 3

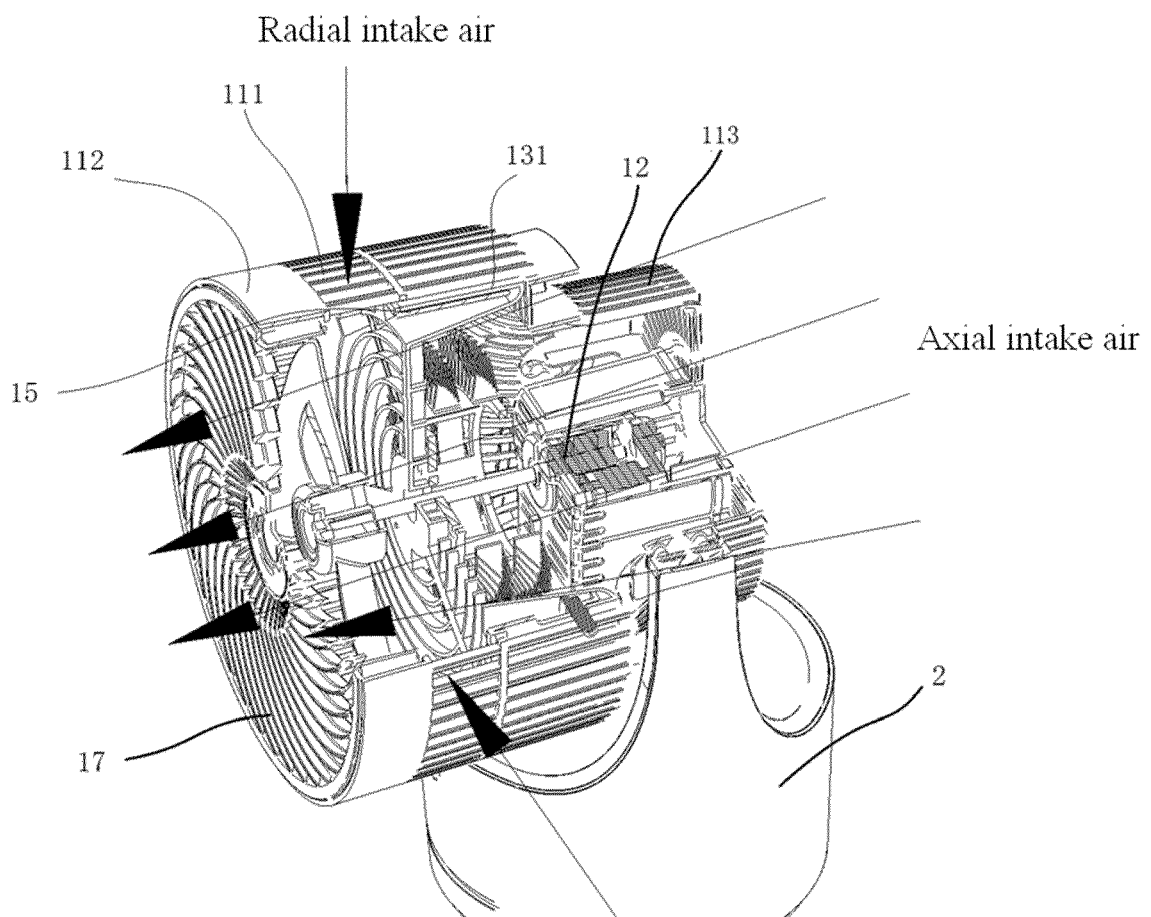


Figure 4

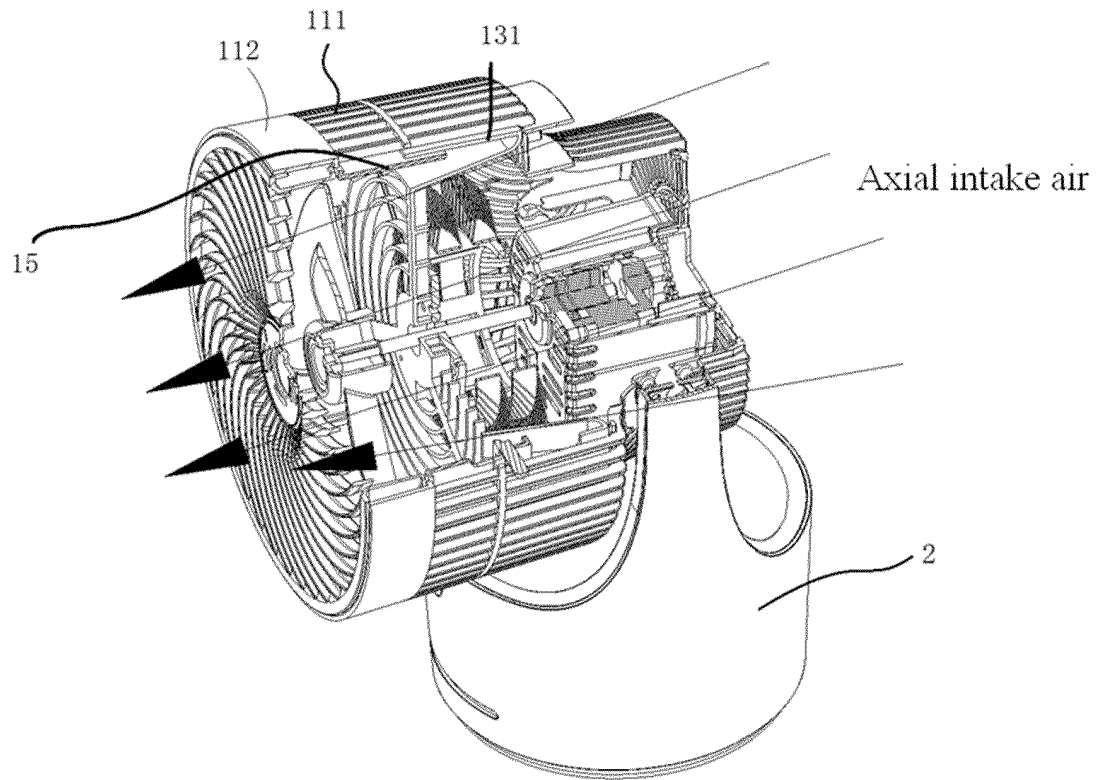


Figure 5

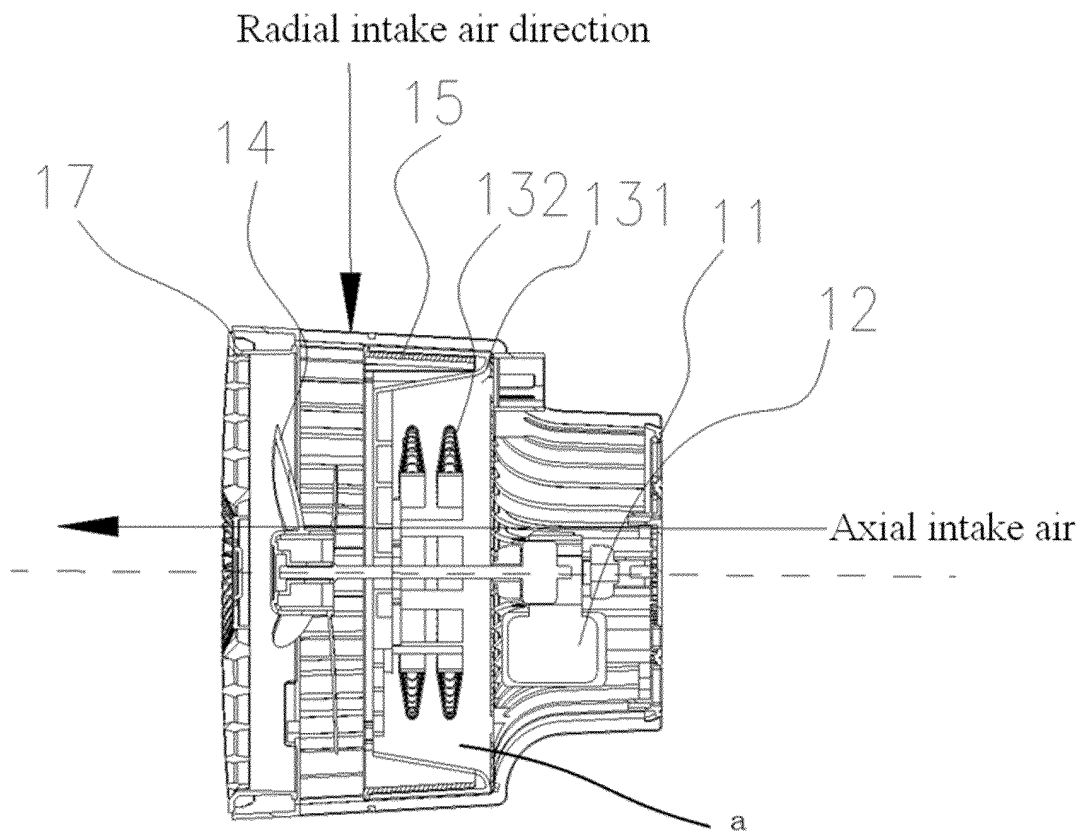


Figure 6

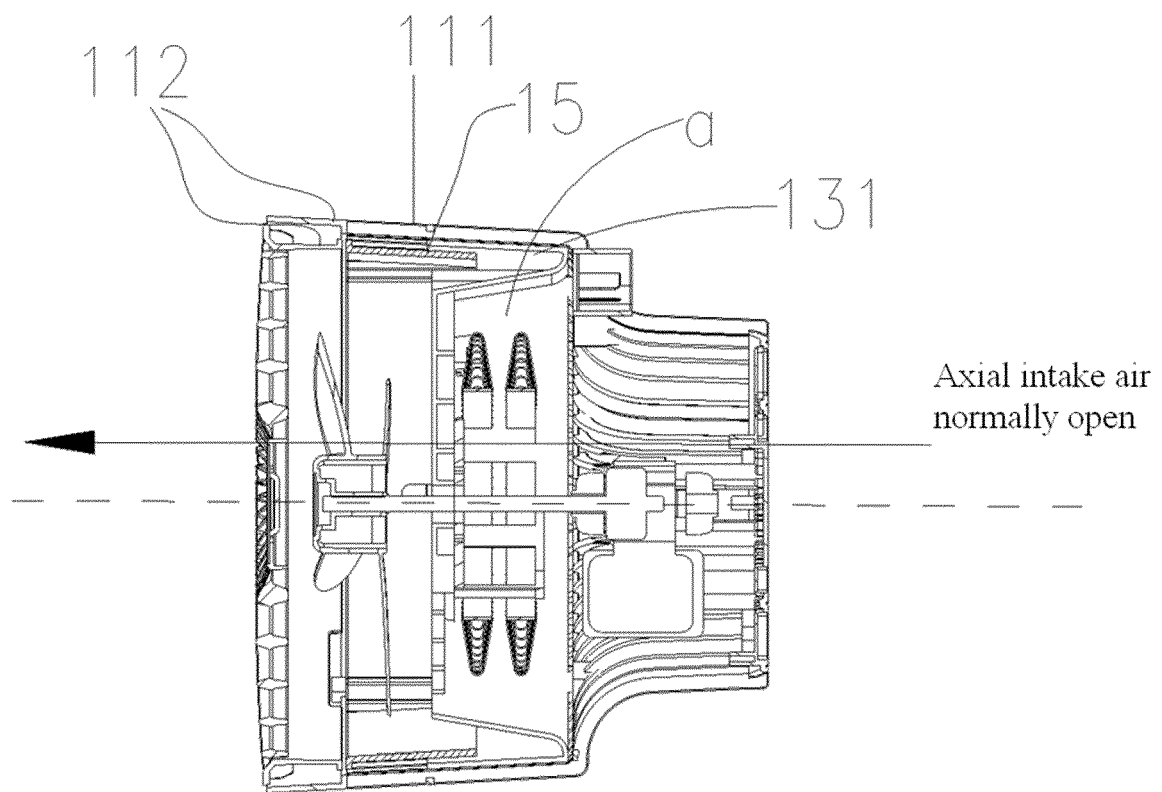


Figure 7

**REFERENCES CITED IN THE DESCRIPTION**

*This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.*

**Patent documents cited in the description**

- CN 206903897 [0003]