

Description

ELECTRICAL APPLIANCES WITH REJUVENATION FUNCTION

Related Applications

The present application claims the priority of the following Chinese patent applications: the application filed on July 6, 2023, with an application number of 202321778276.3 and entitled “Heater”; the application filed on July 6, 2023, with an application number of 202321787666.7 and entitled “Heater”; the application filed on December 28, 2023, with an application number of 202323626439.9 and entitled “Air Regulation Apparatus and Air Regulation Device”; the application filed on April 11, 2023, with an application number of 202320795242.9 and entitled “Phototherapy Beauty Lamp and Bathroom Fan with Heater”; the application filed on April 11, 2023, with an application number of 202320862602.2 and entitled “Heater with Heat Dissipation Function”, the contents of which are incorporated herein by reference in their entireties.

Technical Field

The present application relates to the technical field of electrical appliances, in particular to an electrical appliance with a rejuvenation function.

Background

Bathroom fans with heaters are preferred heating devices for many households during bathing. In the industry, bathroom fans with heaters are also called multi-functional heaters. Some bathroom fans with heaters integrate functions such as heating, lighting, ventilation, air blowing, air guiding, and air purification. At present, there is a type of bathroom fan with heater with a rejuvenation lamp. The rejuvenation lamp has therapeutic and cosmetic effects on human skin. The rejuvenation lamp will generate a large amount of heat during operation. If the heat cannot be released timely, the therapeutic effect and service life of the rejuvenation lamp will be influenced, and the heat limits an upper limit of the power of the rejuvenation lamp installed in the bathroom fan with heater. Therefore, there is an urgent need for a heater with a cooling and heat dissipation function.

Summary of the Invention

According to various embodiments of the present application, an electrical appliance with a rejuvenation function is provided. The electrical appliance with a rejuvenation function includes a main body, an air regulation device arranged on the main body, a rejuvenation lamp arranged on the main body, and a heat dissipation structure connected to the rejuvenation lamp.

In one embodiment, the rejuvenation lamp includes a heat accumulation portion; the heat dissipation structure includes a heat dissipation chamber and a fluid driving member; the heat dissipation chamber is connected to the heat accumulation portion; and the fluid driving member is configured to drive fluid to flow in the heat dissipation chamber.

In one embodiment, the heat dissipation chamber includes a wind inlet and a wind outlet that are in communication with each other; the fluid driving member includes a wind driving member; and the wind driving member is arranged at one of the wind inlet and the wind outlet.

In one embodiment, the heat dissipation structure further includes a heat dissipation member connected to the heat accumulation portion; the heat dissipation member is configured as follows: the heat dissipation member includes a plurality of fins spaced apart from one another; and/or the heat dissipation member is arranged in the heat dissipation chamber.

In one embodiment, the rejuvenation lamp includes a light-emitting portion; the heat dissipation structure further includes a covering member that is covered on a side of the rejuvenation lamp facing away from the light-emitting portion; and the heat dissipation chamber is formed on a side of the covering member relatively close to the rejuvenation lamp.

In one embodiment, the main body includes a panel provided with the rejuvenation lamp, and further includes an enclosure portion arranged on a side of the panel away from an indoor space; the enclosure portion has an installation space; the installation space is provided with a wind delivery opening leading to the heat accumulation portion of the rejuvenation lamp; the heat dissipation structure includes a wind driving member; and the wind driving member is at least partially arranged in the installation space and is configured to drive air to flow out of

the installation space through the wind delivery opening and flow towards the heat accumulation portion.

In one embodiment, the main body further includes a housing and a spacer; the panel and the rejuvenation lamp are arranged on one side of the spacer; and the other side of the spacer and the housing together enclose an inner cavity that accommodates the air regulation device.

In one embodiment, the heat dissipation structure includes the wind driving member arranged within the housing; the housing has the installation space and forms the enclosure portion; and/or the enclosure portion includes a hollow boss; the hollow boss has a hollow channel and at least part of the wind driving member is sleeved by the hollow boss through the hollow channel; and the wind delivery opening is an opening at an end of the hollow channel relatively close to the panel.

In one embodiment, the enclosure portion includes the hollow boss; the hollow boss has the hollow channel and at least part of the wind driving member is sleeved by the hollow boss through the hollow channel; and the wind delivery opening is an opening at the end of the hollow channel relatively close to the panel; and

the hollow boss is arranged on the spacer; the hollow channel penetrates through both sides of the spacer; and the heat dissipation structure further includes a heat dissipation chamber formed between the panel and the spacer.

In one embodiment, the hollow boss is located inside the housing, and the hollow channel is in communication with the inner cavity; or the hollow boss is located on a side of the spacer away from the panel; the hollow boss is located outside the inner cavity; and the hollow channel is in communication with a space outside the housing.

In one embodiment, the main body is provided with a heat dissipation air inlet, and is internally provided with an inner cavity that is in communication with the installation space; the heat dissipation air inlet communicates the inner cavity with a space outside the main body, thereby allowing the wind driving member to draw air from the space outside the main body into the installation space.

In one embodiment, the main body includes a grille; the heat dissipation air inlet is provided in the grille; and a side of the grille facing away from the inner cavity is inclined to face away from the ground.

In one embodiment, the main body further includes a covering member and a hollow flange connected to the enclosure portion; the covering member is covered on a side of the panel away from the indoor space, and the covering member and the panel together enclose the heat dissipation chamber; the covering member includes a butt-joint portion; the butt-joint portion is provided with a butt-joint opening that is in communication with the heat dissipation chamber; and one of the hollow flange and the butt-joint portion is sleeved on the other of the hollow flange and the butt-joint portion to communicate the wind delivery opening with the butt-joint opening.

In one embodiment, the air regulation device includes a first fan arranged on the main body; the first fan is a centrifugal fan; the heat dissipation structure includes a heat dissipation duct connected to the rejuvenation lamp; the heat dissipation duct includes a first wind opening and a second wind opening; one of the first wind opening and the second wind opening forms a wind inlet, while the other of the first wind opening and the second wind opening forms a wind outlet; and an opening of the wind outlet is arranged opposite to an impeller center of the first fan.

In one embodiment, the main body includes a panel provided with the rejuvenation lamp; the first fan and the heat dissipation duct are both located on the same side of the panel; and the first fan, the heat dissipation duct, the rejuvenation lamp, and the panel are installed in a stacked manner in sequence.

In one embodiment, the heat dissipation structure includes a wind outlet member arranged on the heat dissipation duct; the wind outlet member protrudes outwards along a wind outlet direction of the wind outlet and extends in a direction close to the first fan; and the wind outlet is in communication with the interior of the wind outlet member.

In one embodiment, a center line of an opening of the wind outlet is arranged parallel to a center line of the impeller center; and/or the impeller center extends into an opening of the wind outlet.

In one embodiment, the main body is provided with a wind outlet window that is in communication with an indoor space; the air regulation device further includes an airflow channel; one of the first wind opening and the second wind opening faces an air inlet portion of the first fan; a wind outlet portion of the first fan is located within the airflow channel; the

airflow channel includes at least one wind outlet end; and each of the at least one wind outlet end is in communication with the wind outlet window or an outdoor space.

In one embodiment, the airflow channel includes a ventilation duct and a wind-blowing duct, and the wind outlet portion of the first fan is located within the ventilation duct; the air regulation device further includes a second fan; the second fan is a centrifugal fan; and a wind outlet portion of the second fan is located within the wind-blowing duct; the first wind opening faces the wind inlet portion of the first fan and is arranged opposite to the impeller center of the first fan; and the second wind opening faces a wind inlet portion of the second fan and is arranged opposite to an impeller center of the second fan; and the at least one wind outlet end includes a ventilation discharge end and a wind blowing discharge end; the ventilation discharge end is located at an end of the ventilation duct away from the main body; and the wind blowing discharge end is in communication with the wind outlet window.

In one embodiment, the airflow channel includes a ventilation duct; the wind outlet portion of the first fan is located inside the ventilation duct; the wind outlet end includes a ventilation discharge end in communication with the outdoor space; the ventilation discharge end is located at an end of the ventilation duct relatively away from the main body; and the rejuvenation lamp is coupled to the first fan, such that the first fan can be activated for operation after the rejuvenation lamp is brought into operation.

In one embodiment, the electrical appliance with a rejuvenation function further includes a wind outlet member, wherein the wind outlet member is arranged at one of the first wind opening and the second wind opening that faces the first fan; and the wind outlet member protrudes outwards from the heat dissipation duct and extends in a direction close to the first fan; the airflow channel includes a ventilation duct and a wind-blowing duct, wherein the wind outlet portion of the first fan is located in the ventilation duct; the air regulation device further includes the second fan; and a wind outlet portion of the second fan is located in the wind-blowing duct; the at least one wind outlet end includes a ventilation discharge end and a wind blowing discharge end, wherein the ventilation discharge end is located at an end of the ventilation duct away from the main body, and the wind blowing discharge end is in communication with the wind outlet window; and the distance from the wind outlet member to the wind inlet portion of the first fan is d ; the other one of the first wind opening and the

second wind opening faces a wind inlet portion of the second fan; and the distance from said other one of the first wind opening and the second wind opening that faces the second fan to the wind inlet portion of the second fan is c , and d is less than c .

In one embodiment, the main body includes a volute, a wind-collecting plate, a panel and a movable baffle; the volute has a volute passage therein; the wind-collecting plate is arranged between the volute and the panel; the panel is provided with the rejuvenation lamp; a cavity is formed between the panel and the wind-collecting plate; the panel is formed with an air inlet that is in communication with the volute passage; the wind-collecting plate is provided with a heat dissipation hole; air in the volute passage is able to enter the cavity through the heat dissipation hole; and the movable baffle is configured to close or open the heat dissipation hole.

In one embodiment, the volute passage has a wind-blowing duct and a ventilation duct; at least two movable baffles are provided, at least one movable baffle is arranged in the wind-blowing duct and at least one movable baffle is arranged in the ventilation duct, respectively; and one heat dissipation hole is arranged to correspond to each of the movable baffles.

In one embodiment, the volute passage has a wind-blowing duct; the movable baffle is arranged in the wind-blowing duct, and the heat dissipation hole is arranged to correspond to the movable baffle.

In one embodiment, the panel is further provided with an air outlet; a heating device is further arranged in the wind-blowing duct; the heating device includes a heating structure and an output pipe; an opening end of the heating structure is in communication with the wind-blowing duct; an output end of the heating structure is in communication with one end of the output pipe; the other end of the output pipe is connected to the air outlet; and the movable baffle in the wind-blowing duct is arranged on a front side of the opening end of the heating structure.

In one embodiment, an opening height h of the movable baffle is less than or equal to $H/6$, and H is the height of the volute passage.

The details of one or more embodiments of the present application are set forth in the following drawings and description. Other features, objects, and advantages of the present

application will become apparent from the specification, the drawings, and the claims.

Brief Description of the Drawings

One or more drawings may be referred to in order to better describe and illustrate the embodiments and/or examples of the inventions disclosed herein. Additional details or examples used to describe the drawings should not be considered as limiting the scope of any of the disclosed inventions, the currently described embodiments and/or examples, and the best mode of these inventions as currently understood.

Fig. 1 is an exploded schematic diagram of an electrical appliance with a rejuvenation function according to one or more embodiments/some embodiments;

Fig. 2 is a cross-sectional view of a partial structure of an electrical appliance with a rejuvenation function according to one or more embodiments/some embodiments.

Fig. 3 is a cross-sectional view of a partial structure of an electrical appliance with a rejuvenation function according to one or more embodiments/some embodiments;

Fig. 4 is an exploded schematic diagram of an electrical appliance with a rejuvenation function according to one or more embodiments/some embodiments;

Fig. 5 is a schematic diagram of a partial structure of an electrical appliance with a rejuvenation function according to one or more embodiments/some embodiments;

Fig. 6 is a schematic diagram of a partial structure of an electrical appliance with a rejuvenation function according to one or more embodiments/some embodiments;

Fig. 7 is a schematic diagram of a partial structure of an electrical appliance with a rejuvenation function according to one or more embodiments/some embodiments;

Fig. 8 is a cross-sectional view of a partial structure of an electrical appliance with a rejuvenation function according to one or more embodiments/some embodiments;

Fig. 9 is a cross-sectional view of a partial structure of an electrical appliance with a rejuvenation function according to one or more embodiments/some embodiments;

Fig. 10 is a cross-sectional view of a partial structure of an electrical appliance with a rejuvenation function according to one or more embodiments/some embodiments;

Fig. 11 is a schematic diagram of a partial structure of an electrical appliance with a rejuvenation function according to one or more embodiments/some embodiments;

Fig. 12 is a partially enlarged schematic diagram of an electrical appliance with a rejuvenation function shown in Fig. 11 at position A;

Fig. 13 is a schematic diagram of a partial structure of an electrical appliance with a rejuvenation function according to one or more embodiments/some embodiments;

Fig. 14 is a partially enlarged schematic view of an electrical appliance with a rejuvenation function shown in Fig. 13 at position B;

Fig. 15 is a schematic diagram of a partial structure of an electrical appliance with a rejuvenation function according to one or more embodiments/some embodiments;

Fig. 16 is a cross-sectional view of a partial structure of an electrical appliance with a rejuvenation function according to one or more embodiments/some embodiments;

Fig. 17 is a cross-sectional view of a partial structure of an electrical appliance with a rejuvenation function according to one or more embodiments/some embodiments;

Fig. 18 is a schematic diagram of a partial structure of an electrical appliance with a rejuvenation function according to one or more embodiments/some embodiments;

Fig. 19 is a cross-sectional view of an electrical appliance with a rejuvenation function according to one or more embodiments/some embodiments;

Fig. 20 is a cross-sectional view of an electrical appliance with a rejuvenation function according to one or more embodiments/some embodiments.

Fig. 21 is a partially enlarged schematic view of an electrical appliance with a rejuvenation function shown in Fig. 20 at position C;

Fig. 22 is a top view of an electrical appliance with a rejuvenation function according to one or more embodiments/some embodiments.

Reference numerals in the figures: 100. electrical appliance with a rejuvenation function; 10. main body; 11. housing; 111. inner cavity; 112. heat dissipation air inlet; 113. grille; 1131. water drainage surface; 114. heat dissipation wind outlet; 12. panel; 121. frame; 122. rear cover; 123. air inlet; 124. air outlet; 13. wind-collecting plate; 131. first airflow inlet; 132. second airflow inlet; 133. heat dissipation hole; 134. ventilation hole; 125. wind outlet window; 135. wind blowing hole; 14. volute; 141. volute passage; 15. enclosure portion; 151. hollow boss; 152. installation space; 153. wind delivery opening; 16. covering member; 161. butt-joint portion; 162. butt-joint opening; 17. spacer; 171. hollow flange; 18. movable baffle;

20. air regulation device; 201. centrifugal impeller; 2011. impeller center; 21. first fan; 21k. first impeller center; 212. first wind outlet portion; 22. second fan; 221. second impeller center; 222. second wind outlet portion; 202. airflow channel; 23. ventilation duct; 24. wind-blowing duct; 203. wind outlet end; 2031. ventilation discharge end; 2032. wind blowing discharge end; 30. rejuvenation lamp; 31. light-emitting portion; 32. heat accumulation portion; 33. lens; 34. circuit board; 35. heat dissipation plate; 40. heat dissipation structure; 41. heat dissipation chamber; 411. wind inlet; 412. wind outlet; 42. fluid driving member; 421. wind driving member; 43. heat dissipation duct; 431. first wind opening; 432. second wind opening; 44. heat dissipation member; 441. fin; 4411. fin gap; 442. base plate; 443. heat dissipation channel; 451. converging channel; 46. wind outlet member; 461. wind outlet channel; 462. wind guiding portion; 50. heating device; 51. heating structure; 52. output pipe; 61. limiting structure; 62. power structure; 63. transmission shaft.

Detailed Description of the Embodiments

The present application provides an electrical appliance 100 with a rejuvenation function, and the electrical appliance 100 can be a heater with a rejuvenation function, a ventilation fan with a rejuvenation function, or a fresh air ventilator with a rejuvenation function. The electrical appliance 100 with a rejuvenation function in the present application includes a main body 10, a rejuvenation lamp 30 arranged on the main body 10, and a heat dissipation structure 40 connected to the rejuvenation lamp 30. The rejuvenation lamp 30 is configured to achieve a rejuvenation function, and the rejuvenation function includes one or more of physical therapy and maintenance, beauty care, skin care, and body shaping.

On the basis of blowing hot air into an indoor space through the air regulation device 20 to heat the indoor space, the panel 12 is equipped with a rejuvenation lamp 30 with a beauty function. On this basis, the panel 12 can also be equipped with functional modules for providing more auxiliary functions. The functional modules include one or more of a lighting lamp, a status display unit, a heating lamp, etc.

The rejuvenation lamp 30 is configured to generate light with special wavelengths, such as blue light, red light, yellow light, infrared light, etc. These lights can directly or indirectly produce different cosmetic effects on the skin, such as skin brightening, skin condition

improvement, skin tone enhancement, pore refinement, etc. Therefore, the rejuvenation lamp 30 is also called a beauty lamp or a therapeutic lamp. Blue light has functions of sterilization, anti-inflammation, and reducing oil secretion, can relieve problems such as acne and pimples, and can also improve problems such as acne marks, skin pigmentation, and dull skin. Red light can promote the production of collagen and increase skin elasticity, and can improve problems such as wrinkles and skin laxity. Infrared light can promote blood circulation and also has functions of relieving body pain, eliminating or alleviating body inflammation, and resisting human spasms.

The selectable wavelength of blue light ranges from 400 nm to 500 nm, the wavelength of red light ranges from 600 nm to 700 nm, the wavelength of yellow light ranges from 570 nm to 600 nm, and the wavelength of infrared light ranges from 850 nm to 1500 nm. The specific wavelength depends on different beauty functions and treatment purposes.

The wavelength of blue light ranges from 400 nm to 470 nm. Blue light has certain curative effects on treating acne, inflammation, allergies, etc., and can destroy the DNA structure of bacteria and cause their death, so as to reduce the occurrence of acne and inflammation.

The wavelength of red light ranges from 630 to 700 nm. Red light has certain curative effects in promoting the metabolism of skin cells, increasing skin elasticity and firmness, reducing skin pigmentation and improving blood circulation, etc., and can brighten the skin tone. The red light can stimulate the production of collagen, so as to reduce wrinkles and laxity.

The yellow light can promote blood circulation and lymphatic detoxification, increase the toughness of capillaries, improve the immune function of skin, reduce skin sensitivity, decompose pigments, fade skin pigmentation, and refine pores.

Fig. 1 shows a partial structure of a heater with a rejuvenation function after an air regulation device 20 is omitted. The heater with a rejuvenation function realizes a warm-air function through the air regulation device 20. The main body 10 includes a housing not shown in the figure and also includes a panel 12 that is matched with the housing.

Referring to Fig. 1, the panel 12 includes a frame 121, a rear cover 122, and a lens 33, wherein the frame 121 is configured to accommodate at least part of the components of the

rejuvenation lamp 30; the frame 121 has upward and downward openings; the lens 33 closes an opening on one side of the frame 121; and the rear cover 122 closes an opening on the other side of the frame 121.

Optionally, the lens 33 can also be an integrally formed part of the frame 121.

The rejuvenation lamp 30 is arranged within the frame 121 of the panel 12. Referring to Fig. 1, the rejuvenation lamp 30 includes a circuit board 34 and a heat dissipation plate 35 which are of plate-shaped structures. The rejuvenation lamp 30 is located on one side in a direction of the lens 33; the lens 33 forms a light-emitting portion 31 of the rejuvenation lamp 30; and the heat dissipation plate 35 is located on one side in a direction of the rear cover 122. At least part of the heat dissipation plate 35 abuts against a surface of the circuit board 34; the heat dissipation plate 35 is connected to the surface of the circuit board 34 through thermal grease; and the circuit board 34 forms the heat accumulation portion 32 of the rejuvenation lamp 30.

The heat dissipation plate 35 is usually made of metal materials, such as aluminum, copper, and aluminum alloy. These materials have good thermal conductivity and can quickly absorb the heat generated by the rejuvenation lamp 30. The heat is rapidly dissipated through surface heat dissipation, thereby maintaining the normal operation of the rejuvenation lamp 30.

Optionally, the material of the heat dissipation plate 35 can also be ceramic or glass.

Under normal circumstances, the power and radiation angle of the rejuvenation lamp 30 will affect the radiation range of the light. When the power is relatively low, the radiation range will be relatively smaller, and the human face needs to be closer. It is not very convenient to use. Therefore, the power of the rejuvenation lamp 30 needs to be increased. After the power is increased, a large amount of heat will be generated and transferred to the circuit board 34 and the housing.

Therefore, it is necessary to provide a heat dissipation structure 40 for the rejuvenation lamp 30 and the panel 12. The heat dissipation structure 40 includes at least a fluid driving member 42 and also has a heat dissipation path. At least part of the rejuvenation lamp 30 is located on the heat dissipation path. The fluid driving member drives the cooling medium to flow through the rejuvenation lamp 30 along a heat dissipation path to absorb and carry away

the heat of the rejuvenation lamp 30.

Optionally, the fluid driving member 42 includes a wind driving member 421. The wind driving member 421 can be a fan or other air-blowing components. The heat dissipation structure 40 further includes an inlet serving as the wind inlet 411 and an outlet serving as the wind outlet 412. A heat dissipation path for air to flow through is formed between the wind inlet 411 and the wind outlet 412.

Optionally, the wind driving member 421 is arranged at the wind inlet 411 of the rear cover 122, and at least part of the rejuvenation lamp 30 is located on this heat dissipation path.

Optionally, the heat dissipation plate 35 of the rejuvenation lamp 30 is located on the heat dissipation path. A fluid driving member 42 is arranged upstream of the rejuvenation lamp 30. The fluid driving member 42 outputs a flowing cooling medium and delivers the flowing cooling medium into the heat dissipation path. The cooling medium passes through the position of the heat dissipation plate 35 to carry the heat generated at the rejuvenation lamp 30 out from the wind outlet 412.

Referring to Figs. 1 and 2, in order to enhance the heat dissipation effect, the heat dissipation structure 40 further includes a heat dissipation member 44 arranged between the rear cover 122 and the heat dissipation plate 35. The heat dissipation member 44 is located on the heat dissipation path, and at least part of the heat dissipation member 44 abuts against the surface of the rejuvenation lamp 30. Specifically, the heat dissipation member 44 may abut against the surface of the heat dissipation plate 35.

Optionally, the heat dissipation member 44 is made of the same material as the heat dissipation plate 35, and the material can be specifically aluminum.

Referring to Fig. 2, the heat dissipation member 44 includes a base plate 442 and fins 441, wherein the base plate 442 is fixed to the surface of the heat dissipation plate 35; a plurality of fins 441 are located on the base plate 442; fin gaps 4411 located on the heat dissipation path are arranged between adjacent fins 441 or arranged on each fin 441; and the fin gaps 4411 form heat dissipation channels 443. When the cooling medium passes through the heat dissipation channels 443 on the plurality of fins 441, the heat dissipation area can be increased; heat is transferred from the circuit board 34 to the heat dissipation plate 35 and is dissipated from the surfaces of the plurality of fins 441, thereby improving the heat

dissipation efficiency.

Optionally, the heat dissipation channel 443 is linear, zigzag, arc-shaped or wave-shaped. Various shapes can increase the contact area with the airflow and enhance the heat dissipation effect.

Optionally, the heat dissipation channel 443 extends along the direction of the heat dissipation path, thereby reducing the flow resistance of the cooling medium, increasing the flow velocity of the cooling medium, improving the exchange efficiency of heat transfer, and enhancing the heat dissipation efficiency.

Referring to Figs. 1 and 3, the wind inlet 411 and the wind outlet 412 are provided on the rear cover 122. When the rear cover 122 is arranged in a strip shape, the wind inlet 411 and the wind outlet 412 are respectively located at both ends of the rear cover 122 in a length direction.

Optionally, a heat dissipation chamber 41 forming a heat dissipation path is arranged between the rear cover 122 and the rejuvenation lamp 30, that is, between the rear cover 122 and the heat dissipation plate 35. The wind inlet 411 and the wind outlet 412 are in communication with the heat dissipation chamber 41. Therefore, the heat dissipation member 44 is arranged in the heat dissipation chamber 41.

When the wind driving member 421 is a fan, an impeller of the wind driving member 421 rotates and delivers flowing airflow into the heat dissipation path. Blowing by the wind driving member 421 can quickly carry away heat, and dissipate heat from the frame 121, the heat dissipation plate 35, the fins 441 and the circuit board 34 more rapidly, thereby improving the stability of the configuration of the high-power rejuvenation lamp 30. In addition, blowing by the wind driving member 421 can also keep the surface of the heat dissipation plate 35 dry and prevent corrosion problems caused by moisture.

Optionally, the rear cover 122 is also provided with a converging channel 451. The converging channel 451 is in communication with the heat dissipation chamber 41 and is arranged perpendicular to the heat dissipation chamber 41. The wind inlet 411 is located on a distal side of the converging channel 451 away from the heat dissipation chamber 41.

Optionally, the rear cover 122 is also provided with a converging channel 451 that is in communication with the heat dissipation chamber 41. The converging channel 451 and the

heat dissipation chamber 41 are arranged obliquely to each other. The wind driving member 421 is located at the wind inlet 411 or inside the converging channel 451.

When the converging channel 451 and the heat dissipation chamber 41 are in communication with each other and arranged perpendicular to each other, the wind driving member 421 is located at the wind inlet 411. The wind driving member 421 is spaced apart from the heat dissipation chamber 41, and the length of the spacing is determined according to the designed wind speed of the wind driving member 421.

When the wind driving member 421 is closer to a bottom wall of the heat dissipation chamber 41 on a side close to the rejuvenation lamp 30, the blowing wind speed is high, the resistance acting on a bottom wall of the heat dissipation chamber 41 is large, and a vortex zone is formed at a corner of the heat dissipation chamber 41. The vortex zone blocks the airflow from entering the heat dissipation chamber 41.

When the converging channel 451 is added, a certain spacing is formed between the wind driving member 421 and the heat dissipation chamber 41, such that the airflow blown by the wind driving member 421 needs to travel a certain distance before entering the heat dissipation chamber 41 or reaching the bottom wall of the heat dissipation chamber 41. The converging channel 451 is equivalent to a buffer channel, which reduces the wind speed at the heat dissipation chamber 41, greatly reduces the formation of the vortex area, avoids the resistance caused by the vortex area, and increases the wind intake volume.

Optionally, the fluid driving member 42 can also be a water source, and the cooling medium is cooling water or chemical coolant.

Referring to Figs. 4 to 10, the electrical appliance 100 with a rejuvenation function can be a heater with a rejuvenation function. The main body 10 includes a housing 11, a volute 14, a panel 12, a wind-collecting plate 13, and a movable baffle 18. The rejuvenation lamp 30 is arranged on the panel 12. The air regulation device 20 includes a centrifugal fan arranged inside the housing 11.

Optionally, the volute 14 is arranged inside the housing 11. The volute 14 is internally provided with a volute passage 141. The panel 12 is also provided with an air inlet 123, and the air inlet 123 is in communication with the volute passage 141; the wind-collecting plate 13 is arranged between the volute 14 and the panel 12; a cavity is formed between the panel

12 and the wind-collecting plate 13, and this cavity forms the heat dissipation chamber 41 of the heat dissipation structure 40.

The heat dissipation structure 40 further includes a heat dissipation hole 133 provided on the wind-collecting plate 13. The air in the volute passage 141 is able to enter the cavity between the panel 12 and the wind-collecting plate 13 through the heat dissipation hole 133. The movable baffle 18 is configured to close or open the heat dissipation hole 133.

Optionally, the centrifugal fan includes a centrifugal impeller 201; the volute 14 is a housing formed on a peripheral side of the centrifugal fan; a volute passage 141 is formed between the volute 14 and a bottom surface of the housing 11; the wind-collecting plate 13 is separately arranged from the volute 14 and seals an end of the volute passage 141 away from the bottom surface of the housing 11, to form an air duct for gas circulation.

Optionally, the wind-collecting plate 13 can also be integrally formed with the volute 14, or the wind-collecting plate 13 can be a part of the centrifugal fan.

Referring to Fig. 4, the panel 12 is covered on an upper end of the volute 14; the wind-collecting plate 13 is arranged between the panel 12 and the volute 14; the wind-collecting plate 13 can separate the panel 12 from the volute 14; and a cavity is enclosed by the wind-collecting plate 13 and the panel 12. Air inlets 123 are provided on at least three sides of the circumferential side of the panel 12.

Referring to Fig. 6, air inlets 123 are respectively provided on a lower side and left and right sides of the panel 12; the volute passage 141 is in communication with each of the air inlets 123, and air enters the volute passage 141 through the air inlets 123. A heat dissipation hole 133 is provided on the wind-collecting plate 13, allowing the air in the volute passage 141 to enter the cavity through the heat dissipation hole 133. The back of the rejuvenation lamp 30 is the heat accumulation portion 32 of the rejuvenation lamp 30, and the back of the rejuvenation lamp 30 is arranged in the cavity. The flowing air entering the cavity can take away part of the heat generated by the rejuvenation lamp 30 to dissipate heat from the rejuvenation lamp 30.

The movable baffle 18 is rotatably arranged in the volute passage 141 and is located at a lower end of the heat dissipation hole 133. An upper end surface of the movable baffle 18 can be attached to the lower end of the heat dissipation hole 133 to close the heat dissipation hole

133, such that air in the volute passage 141 cannot enter the cavity.

Optionally, the movable baffle 18 can rotate clockwise to disengage from the heat dissipation hole 133, and the heat dissipation hole 133 is opened. As a result, air in the volute passage 141 can enter the cavity through the heat dissipation hole 133. The rejuvenation lamp 30 is electrically connected to a switch, and the movable baffle 18 is also electrically connected to the switch.

When the switch is turned on, the rejuvenation lamp 30 emits light, and the movable baffle 18 also rotates clockwise accordingly. The air in the volute passage 141 enters the cavity to dissipate heat from the rejuvenation lamp 30. When the switch is turned off, the rejuvenation lamp 30 is turned off, and the movable baffle 18 also rotates counterclockwise accordingly. An upper end surface of the movable baffle 18 is attached to a lower end of the heat dissipation hole 133, thereby closing the heat dissipation hole 133 and preventing air from entering the cavity.

Optionally, the movable baffle 18 can also be slidably arranged on the wind-collecting plate 13. When the switch is turned on, the rejuvenation lamp 30 emits light, and the movable baffle 18 slides accordingly to open the heat dissipation hole 133. The air in the volute passage 141 enters the cavity to dissipate heat from the rejuvenation lamp 30. When the switch is turned off, the rejuvenation lamp 30 is turned off, the movable baffle 18 also slides accordingly to close the heat dissipation hole 133, and the heat dissipation hole 133 is closed, such that air cannot enter the cavity.

Optionally, the volute passage 141 has a wind-blowing duct 24; the movable baffle 18 is arranged in the wind-blowing duct 24; and the heat dissipation hole 133 is arranged to correspond to the movable baffle 18. Referring to Figs. 5 and 7, a left side of the volute passage 141 is the wind-blowing duct 24; the movable baffle 18 is arranged in the wind-blowing duct 24; and the heat dissipation hole 133 is arranged to correspond to the movable baffle 18.

Optionally, the panel 12 is further provided with an air outlet 124; a heating device 50 is further arranged in the wind-blowing duct 24; the heating device 50 includes a heating structure 51 and an output pipe 52; an opening end of the heating structure 51 is in communication with the wind-blowing duct 24; an output end of the heating structure 51 is in

communication with one end of the output pipe 52; the other end of the output pipe 52 is connected to the air outlet 124 of the panel 12; and the movable baffle 18 in the wind-blowing duct 24 is arranged on a front side of the opening end of the heating structure 51.

As shown in Figs. 4 and 5, a heating device 50 is arranged in the wind-blowing duct 24; and the heating device 50 includes a heating structure 51 for heating the air and an output pipe 52 for discharging the heated air. The opening end of the heating structure 51 is in communication with the wind-blowing duct 24; the air in the wind-blowing duct 24 can enter the heating structure 51 for heating; the output pipe 52 is arranged at a rear end of the heating structure 51; one end of the output pipe 52 is connected to the output end of the heating structure 51; the heated air enters the output pipe 52 from the output end of the heating structure 51; and the other end of the output pipe 52 is connected to the air outlet 124 of the panel 12, and the heated air can be discharged through the air outlet 124.

Referring to Fig. 6, the air outlet 124 is arranged on an upper side of the panel 12. As shown in Figs. 5 and 7, the movable baffle 18 is arranged on a right side of the opening end of the heating structure 51.

The wind-collecting plate 13 is also provided with a wind blowing hole 135. The wind blowing hole 135 is arranged to correspond to the output pipe 52; and the other end of the output pipe 52 passes through the wind blowing hole 135 and is connected to the air outlet 124.

Optionally, the heating structure 51 is a PTC heater.

When the heater is used, a blowing mode is usually activated when the rejuvenation lamp 30 is turned on. The rejuvenation lamp 30 is not activated in a ventilation mode. Of course, the blowing mode can also be used when the rejuvenation lamp 30 is turned off.

Referring to Figs. 8 and 9, after the rejuvenation lamp 30 is turned on, the movable baffle 18 rotates clockwise at this time, and is disengaged from the heat dissipation hole 133. Meanwhile, the blowing mode is activated; air enters the volute passage 141 through the air inlet 123 and then enters the wind-blowing duct 24. One part of the air enters the cavity through the heat dissipation hole 133 to dissipate heat from the rejuvenation lamp 30, and the other part of the air enters the heating structure 51 for heating. After the rejuvenation lamp 30 is turned off, the movable baffle 18 rotates counterclockwise and is attached to the heat

dissipation hole 133 for closing the heat dissipation hole 133. At this time, all the air in the wind-blowing duct 24 will enter the heating structure 51 for heating.

Optionally, the movable baffle 18 is rotatably arranged in the volute passage 141; a limiting structure 61 is arranged in the volute passage 141; the limiting structure 61 is arranged at a lower end of the movable baffle 18; and the limiting structure 61 is suitable for limiting a rotation angle of the movable baffle 18.

As shown in Figs. 8 and 10, a limiting structure 61 is arranged below a right end of the movable baffle 18; and the limiting structure 61 is fixedly arranged on an inner side wall of the volute passage 141. When the movable baffle 18 rotates clockwise, the limiting structure 61 can limit the movement of the movable baffle 18, thereby preventing the movable baffle 18 from opening too wide, which would cause a large amount of air to enter the cavity, and result in less heated air and affect the blowing function.

Optionally, the limiting structure 61 is a protruding structure.

Optionally, the opening height h of the movable baffle 18 is less than or equal to $H/6$, where H is the height of the volute passage 141.

As shown in Fig. 10, the opening height h of the movable baffle 18 is less than or equal to $H/6$ to prevent excessive loss of the blowing air, which may affect the blowing performance or blowing thermal performance.

Optionally, a power structure 62 is arranged on a side wall of the volute 14, and an output end of the power structure 62 is connected to the movable baffle 18.

Optionally, the output end of the power structure 62 is connected to the transmission shaft 63, and the transmission shaft 63 is rotatably arranged in the volute passage 141. One end of the movable baffle 18 has a through hole, and the movable baffle 18 is fixedly arranged on the transmission shaft 63 through the through hole.

As shown in Figs. 4, 5, and 7, a power structure 62 is arranged on an outer side wall of the volute 14; an output end of the power structure 62 is connected to the transmission shaft 63; and the transmission shaft 63 is rotatably arranged in the wind-blowing duct 24. A through hole is provided at the upper end of the movable baffle 18, and the movable baffle 18 is fixedly arranged on the transmission shaft 63 through the through hole. The power structure 62 is electrically connected to the switch. When the switch is turned on, the output end of the

power structure 62 rotates to drive the transmission shaft 63 to rotate clockwise, and the transmission shaft 63 rotates to drive the movable baffle 18 to rotate clockwise, such that the movable baffle 18 is disengaged from the heat dissipation hole 133. When the switch is turned off, the output end of the power structure 62 rotates to drive the transmission shaft 63 to rotate counterclockwise, and the transmission shaft 63 rotates to drive the movable baffle 18 to rotate counterclockwise, such that the movable baffle 18 closes the heat dissipation hole 133.

Optionally, the power structure 62 is a stepper motor.

Optionally, one side of the centrifugal impeller 201 is the wind-blowing duct 24, and the other side of the centrifugal impeller 201 is the ventilation duct 23. The wind-collecting plate 13 is provided with a ventilation hole 134, wherein the ventilation hole 134 is arranged to correspond to the air inlet of the centrifugal impeller 201, and the ventilation hole 134 is in communication with the air inlet 123.

As shown in Figs. 4 and 5, the centrifugal impeller 201 is arranged in the volute passage 141. The volute passage 141 at a left end of the centrifugal impeller 201 serves as the wind-blowing duct 24, and the volute passage 141 at a right end of the centrifugal impeller 201 serves as the ventilation duct 23. The wind-collecting plate 13 is provided with the ventilation hole 134; the ventilation hole 134 is arranged to correspond to the air inlet of the centrifugal impeller 201; the ventilation hole 134 is in communication with the air inlet 123; and air enters the volute passage 141 through the air inlet 123, the ventilation hole 134 and the air inlet of the centrifugal impeller 201 in sequence.

In the blowing mode, the centrifugal impeller 201 rotates clockwise, so as to accelerate the air speed and blow the air into the wind-blowing duct 24. In the ventilation mode, the centrifugal impeller 201 rotates counterclockwise, to blow the air into the ventilation duct 23.

Optionally, the rejuvenation lamp 30 can be a flat lamp or an LED lamp with a specific wavelength, etc. For example, the selectable wavelengths of the rejuvenation lamp 30 include: the wavelength of blue light ranges from 400 nm to 500 nm, the wavelength of red light ranges from 600 nm to 700 nm, and the wavelength of yellow light ranges from 570 nm to 600 nm.

In some embodiments, the volute passage 141 has a wind-blowing duct 24 and a ventilation duct 23. At least two movable baffles 18 are arranged, wherein at least one

movable baffle 18 is arranged in the wind-blowing duct 24 and at least one movable baffle 18 is arranged in the ventilation duct 23. The heat dissipation hole 133 is arranged to correspond to the movable baffle 18.

Optionally, two movable baffles 18 are arranged. Movable baffles 18 are arranged in both the wind-blowing duct 24 and the ventilation duct 23. Two heat dissipation holes 133 are provided on the wind-collecting plate 13, and the two heat dissipation holes 133 are respectively arranged to correspond to the two movable baffles 18. In the blowing mode or the ventilation mode, when the rejuvenation lamp 30 is turned on, the air in the wind-blowing duct 24 or the ventilation duct 23 can enter the cavity through one of the heat dissipation holes 133 to dissipate heat from the rejuvenation lamp 30.

The electrical appliance 100 with a rejuvenation function shown in Figs. 11 to 15 is a heater with a rejuvenation function. The main body 10 includes a main part and a panel 12 that is matched with the main part. The main part includes a housing 11, a spacer 17 and an enclosure portion 15, wherein the panel 12 is arranged on the side of the main part relatively close to the indoor space, that is, the main part is arranged on the side of the panel 12 relatively away from the indoor space. The housing 11 is a hollow structure with an inner cavity 111, and is installed in an area between an indoor ceiling and a ceiling wall panel and is supported by the ceiling wall panel. An air regulation device 20 for regulating air is arranged in the inner cavity 111.

The spacer 17 includes a wind-collecting plate 13 installed on the side of the housing 11 close to the ground. The side of the wind-collecting plate 13 away from the ground and the housing 11 together enclose the above inner cavity 111. The panel 12 and the rejuvenation lamp 30 are arranged on the other side of the wind-collecting plate 13, that is, the panel 12 and the rejuvenation lamp 30 are arranged on the side of the wind-collecting plate 13 close to the ground. The panel 12 can be connected to the housing 11, or can be connected to the ceiling wall panel, a keel bracket, a supporting structure for supporting the housing 11, etc.

Optionally, the main body 10 generally has a cuboid-shaped structure, and the panel 12 generally has a rectangular plate-shaped structure.

Optionally, the enclosure portion 15 is provided with an installation space 152 for accommodating the wind driving member 421. The installation space 152 has a wind delivery

opening 153 leading to the heat accumulation portion 32 of the rejuvenation lamp 30. The heat dissipation structure 40 includes the wind driving member 421, and the wind driving member 421 is at least partially arranged within the installation space 152.

As the wind driving member 421 starts and drives the air to form a heat dissipation airflow, the installation space 152 also serves as a place for forming heat dissipation airflow. The wind driving member 421 is configured to drive the air to flow out of the installation space 152 via the wind delivery opening 153, thereby forming a heat dissipation airflow flowing towards the heat accumulation portion 32.

Optionally, the side of the wind-collecting plate 13 away from the housing 11 can also face an indoor wall. At this time, the panel 12 is arranged on the side of the wind-collecting plate 13 that is away from the housing 11 and faces the indoor space. Moreover, the panel 12 does not have to face the ground, as long as the installation space 152 can be in communication with the inner cavity 111 and the installation space 152 has a wind delivery opening 153 leading to the panel 12.

Optionally, the installation space 152 is adjacent to a side of the wind-collecting plate 13 facing away from the indoor space. The installation space 152 connects the side of the wind-collecting plate 13 facing away from the indoor space with the other side facing the indoor space. The wind delivery opening 153 opens towards the panel 12. In this way, the flow path of the heat dissipation airflow from the wind delivery opening 153 to the panel 12 can be shortened and the resistance is reduced.

Optionally, the wind driving member 421 can be a blower, or a fan, or other types of devices capable of disturbing and accelerating the air. The wind driving member 421 is configured to drive the air to form a heat dissipation airflow. The heat dissipation airflow is used to cool the rejuvenation lamp 30 and the panel 12, so as to prolong the service life and improve the operational reliability of the panel 12, the rejuvenation lamp 30 arranged on the panel 12, and the functional modules arranged on the panel 12.

Referring to Figs. 11 to 12 and Figs. 13 to 14, after the panel 12 is properly arranged on a side of the wind-collecting plate 13 close to the ground and thus assembled with the housing 11, the housing 11, the wind-collecting plate 13 and the panel 12 are arranged in a stacked manner in sequence.

Optionally, after the housing 11 is properly arranged in a ceiling space between the indoor ceiling and the ceiling wall panel and is supported by the ceiling wall panel, the housing 11, the wind-collecting plate 13, and the panel 12 are stacked in sequence along a vertical direction, and both the wind-collecting plate 13 and the panel 12 extend in a horizontal direction parallel to the ceiling wall panel.

Referring to Figs. 12 and 14, the inner cavity 111 of the housing 11 and the panel 12 are respectively located on both sides of the wind-collecting plate 13. The installation space 152 penetrates both sides of the wind-collecting plate 13, and the inner cavity 111 is in communication with an area on the side of the wind-collecting plate 13 away from the housing 11 through the installation space 152.

Therefore, after the wind driving member 421 starts to operate, the air in the inner cavity 111 can be sucked in by the wind driving member 421 and flow through the installation space 152, and then flows out of the installation space 152 from the wind delivery opening 153, such that the air flowing out of the wind delivery opening 153 forms a heat dissipation airflow. Finally, the heat dissipation airflow flows towards the heat accumulation portion 32 of the rejuvenation lamp 30 to take away the heat of the rejuvenation lamp 30.

Optionally, the enclosure portion 15 includes a hollow boss 151. The hollow boss 151 protrudes from the side of the wind-collecting plate 13 away from the panel 12 and the ground and has a hollow channel. The hollow channel forms an installation space 152. At least part of the wind driving member 421 is located within the hollow channel and is surrounded and sleeved by a side wall of the hollow boss 151.

Referring to Figs. 12 and 14, the wind driving member 421 includes an axial flow fan arranged in the hollow channel and surrounded by the hollow boss 151. An end of the axial flow fan facing away from the panel 12 and the ground is flush with an end of the hollow boss 151 facing away from the panel 12 and the ground.

Optionally, the hollow boss 151 is integrally formed with the wind-collecting plate 13. An outer side wall of the axial flow fan has the same shape and size as an inner wall surface of the hollow passage, and the two are attached to each other and form a profiling fit. As a result, both the position and attitude of the axial flow fan relative to the enclosure portion 15 and the wind-collecting plate 13 are fixed.

Optionally, referring to Figs. 11 and 13, the hollow boss 151 and the wind driving member 421 arranged in the hollow channel are both located in the inner cavity 111 and surrounded by the housing 11. The installation space 152 is in communication with the inner cavity 111. The housing 11 is also provided with a heat dissipation air inlet 112, and the heat dissipation air inlet 112 communicates the space outside the housing 11 with the inner cavity 111.

Therefore, after the housing 11 is properly arranged in the ceiling space, the ceiling space is in communication with the inner cavity 111 through the heat dissipation air inlet 112, and then is in communication with the installation space 152 and the wind delivery opening 153. The air in the ceiling space is sucked into the inner cavity 111 by the wind driving member 421, then flows through the installation space 152, and finally flows out from the wind delivery opening 153 towards the heat accumulation portion 32.

Optionally, the hollow boss 151 can also be arranged side by side with the housing 11 on the side of the wind-collecting plate 13 away from the panel 12. At this time, the hollow boss 151 is located outside the housing 11, and the hollow channel is in communication with the space outside the housing 11. The enclosure portion 15 is not limited to the hollow boss 151. The enclosure portion 15 can also be other structures arranged inside or outside the housing 11.

Referring to Figs. 11, 13 and 15, the main body 10 further includes a grille 113 formed on the housing 11. The heat dissipation air inlet 112 is provided on the grille 113. The grille 113 includes a water drainage surface 1131 arranged opposite to the inner cavity 111. After the housing 11 is installed in the ceiling space, the water drainage surface 1131 is arranged obliquely relative to the vertical direction and faces away from the ground.

Optionally, the grille 113 is integrally formed with the housing 11. Each grille 113 extends in a horizontal direction. A side wall of the housing 11 is located between a top wall of the housing 11 and the wind-collecting plate 13. Here, the top wall of the housing 11 is the side of the housing 11 that is far from the ground and close to an indoor ceiling. The wind-collecting plate 13 is arranged opposite to and spaced apart from a top wall of the housing 11.

Therefore, when water mist droplets in the ceiling space contact the grille 113, they flow

towards a direction close to the ground along the water drainage surface 1131. When water leakage occurs upstairs, the liquid leaking from the indoor ceiling will flow towards a direction close to the ground along the water drainage surface 1131. Therefore, the grille 113 can provide waterproof protection for the wind driving member 421 and the internal components of the housing 11.

Referring to Figs. 11 to 12 and Figs. 13 to 14, the heat dissipation structure 40 further includes a heat dissipation member 44 thermally connected to the rejuvenation lamp 30, and the wind delivery opening 153 leads to the heat dissipation member 44.

The heat dissipation member 44 and the rejuvenation lamp 30 can form a thermally conductive connection through direct contact, bonding with thermal conductive adhesive, connection with heat transfer elements, etc., such that the heat generated during the operation of the rejuvenation lamp 30 can be conducted to the heat dissipation member 44. After the wind driving member 421 is started, the heat dissipation airflow flows through the heat dissipation member 44 and conducts convective heat transfer with the heat dissipation member 44, thereby carrying away the heat of the heat dissipation member 44.

Optionally, the main body 10 further includes a covering member 16 connected to the panel 12. The covering member 16 and the panel 12 together enclose a heat dissipation chamber 41. Moreover, the covering member 16 is provided with a butt-joint opening 162 that communicates the heat dissipation chamber 41 with the wind delivery opening 153. The heat dissipation member 44 is arranged inside the heat dissipation chamber 41. Therefore, the heat dissipation airflow leaving the housing 11 from the wind delivery opening 153 can be concentrated to blow the heat dissipation member 44 and is not likely to diffuse to the area outside the heat dissipation chamber 41, thereby improving the utilization rate of the heat dissipation airflow.

Referring to Figs. 12 and 14, the heat dissipation member 44 includes a plurality of fins 441 arranged side by side at intervals in the heat dissipation chamber 41. The fins 441 are thermally conductively connected to the side of the heat accumulation portion 32 away from the indoor space and the ground, that is, the fins 441 and the rejuvenation lamp 30 are respectively arranged on two opposite sides of the panel 12. Moreover, the heat dissipation member 44, the heat accumulation portion 32 of the rejuvenation lamp 30, and the

light-emitting portion 31 of the rejuvenation lamp 30 are stacked in sequence. A heat dissipation gap which is in communication with the wind delivery opening 153 to allow the heat dissipation airflow to flow in is formed between any two adjacent fins 441. The covering member 16 is sandwiched between the wind-collecting plate 13 and the panel 12, and covers the side of the panel 12 away from the indoor space and the ground, thereby forming a heat dissipation chamber 41 between the wind-collecting plate 13 and the panel 12. The installation space 152 is located on the side of the heat dissipation chamber 41 away from the panel 12.

Optionally, each of the fins 441 extends from a first end of the panel 12 to a second end of the panel 12. The panel 12 is in the shape of a rectangular plate, and the first end and the second end are respectively the two ends of the panel 12 in the length direction.

Optionally, the installation space 152 includes a hollow channel formed in the hollow boss 151. The extending direction of the hollow channel is consistent with a stacking direction of the wind-collecting plate 13, the covering member 16 and the panel 12. The hollow channel penetrates through both sides of the wind-collecting plate 13 to communicate the heat dissipation chamber 41 with the inner cavity 111. The opening at one end of the hollow channel close to the panel 12 forms a wind delivery opening 153 that is open towards the heat dissipation member 44 and the heat accumulation portion 32. The spacer 17 further includes a hollow flange 171. The hollow flange 171 protrudes from the side of the wind-collecting plate 13 that faces away from the housing 11 and faces the panel 12 and the indoor space. The covering member 16 includes a butt-joint portion 161 formed with the butt-joint opening 162. The wind delivery opening 153 is in communication with the cavity of the hollow flange 171.

Optionally, one of the hollow flange 171 and the butt-joint portion 161 is sleeved over the other and they cooperate with each other. Therefore, a mutual communication state is established among the installation space 152, the wind delivery opening 153, the cavity of the hollow flange 171, the butt-joint opening 162, and the heat dissipation chamber 41, and the heat dissipation airflow flowing out of the wind delivery opening 153 is not prone to leakage.

Referring to Fig. 13, the covering member 16 is also provided with a heat dissipation wind outlet 114. After the heat dissipation airflow absorbs the heat of the heat dissipation member 44, the heat dissipation airflow flows out of the heat dissipation chamber 41 through

the heat dissipation wind outlet 114. The heat dissipation wind outlet 114 can either directly lead to a space outside the main body 10, so as to discharge the heat-absorbing heat dissipation airflow into the ceiling space. Of course, the heat dissipation airflow can also lead to the inside of the housing 11. The air regulation device 20 inside the housing 11 is configured to discharge the heat-absorbing heat dissipation airflow to the outdoor space or the indoor space.

Optionally, the heat dissipation air inlet 112 can also be removed from the housing 11. In this case, the air used to form the heat dissipation airflow is provided by the housing 11. It can be that part of outdoor fresh air enters the inner cavity 111 of the housing 11, then enters the installation space 152 and is driven and accelerated by the wind driving member 421, and then is blown out from the wind delivery opening 153 to form the heat dissipation airflow. It can also be that the housing 11 sucks in indoor air through a wind-collecting opening provided on the wind-collecting plate 13. Part of the sucked-in indoor air enters the installation space 152 and is driven and accelerated by the wind driving member 421 to form the heat dissipation airflow.

Optionally, the hollow boss 151 can also be removed. The enclosure portion 15 is formed by a box plate or a box shell that forms the housing 11. The housing 11 and the wind-collecting plate 13 together enclose the inner cavity 111 of the housing 11. One part of the inner cavity 111 forms an installation space 152 for installing the wind driving member 421, and the other part of the inner cavity 111 is used to accommodate the air regulation device 20. The wind-collecting plate 13 is provided with a wind delivery opening 153 that is in communication with both sides of the wind-collecting plate 13. The opening of the wind delivery opening 153 faces the heat accumulation portion 32. Part of the wind driving member 421 can also be arranged in the inner cavity 111.

The existing heaters have the problem of unreasonable weight distribution. A heat dissipation airflow generating device configured to generate the heat dissipation airflow is integrated in the panel 12, such that the position of the center of gravity of an entirety formed by the panel 12 and the heat dissipation airflow generating device is inconsistent with the position of the center of gravity of the panel 12 itself. When the panel 12 is lifted and installed by an installer, the panel 12 is prone to tilting and misalignment, thereby increasing the risk

that the heat dissipation airflow generating device is collided and damaged by structures such as ceiling wall panels and keel brackets.

The electrical appliance 100 with a rejuvenation function shown in Figs. 11 to 15 integrates the wind driving member 421 into the housing 11 instead of the panel 12. Therefore, when the installer lifts and installs the panel 12, the panel 12 is not prone to tilting and misalignment, thereby eliminating the risk of instability, collision and damage to both the wind driving member 421 and the panel 12.

In addition, the wind driving member 421 is not only integrated into the housing 11, but also can be protected by the enclosure portion 15. The enclosure portion 15 can block structures that may cause collisions and damage to the wind driving member 421. For example, when the housing 11 is being transported into the ceiling space, structures such as ceiling wall panels and keel brackets can be prevented from colliding with the wind driving member 421. On this basis, the housing 11 surrounds and covers the enclosure portion 15 and the wind driving member 421, so as to alleviate the accumulation of a mixture of water mist and dust debris in the ceiling space on the surface of the wind driving member 421, and delay the erosive damage to the wind driving member 421 caused by the mixture of water mist and dust debris.

The electrical appliance 100 with a rejuvenation function shown in Figs. 16 to 18 is also a heater with a rejuvenation function. The main body 10 includes a housing 11 and a panel 12 arranged on the side of the housing 11 relatively close to the indoor space and the ground. The housing 11 can be installed in the opening of the bathroom ceiling; the panel 12 is set facing the user; the rejuvenation lamp 30 is arranged on the panel 12; the panel 12 has a frame 121 arranged on the periphery; and the frame 121 surrounds the periphery of the rejuvenation lamp 30.

The panel 12 is generally in the shape of a flat plate. After the housing 11 is installed, the panel 12 is parallel to the horizontal direction.

The housing 11 is equipped with an air regulation device 20, the air regulation device 20 is configured to blow hot air, warm air or normal-temperature air into the indoor space; and the heat dissipation structure 40 is connected to the rejuvenation lamp 30, and is configured to absorb the heat generated by the rejuvenation lamp 30 and carry the heat away from the

rejuvenation lamp 30.

Referring to Fig. 16, the heat dissipation structure 40 includes a heat dissipation duct 43 which is arranged on the panel 12 and connected to the rejuvenation lamp 30. The heat dissipation duct 43 has a first wind opening 431 and a second wind opening 432 that are in communication with each other.

Taking the electrical appliance 100 with a rejuvenation function being a heater with a rejuvenation function for use in a bathroom as an example, one of the first wind opening 431 and the second wind opening 432 forms a wind inlet 411 for sucking in gas, and the other of the first wind opening 431 and the second wind opening 432 forms a wind outlet 412 for discharging gas. The gas enters the heat dissipation duct 43 through the wind inlet 411 to form a heat dissipation airflow. When the heat dissipation airflow flows through the heat accumulation portion 32 of the rejuvenation lamp 30, the heat of the rejuvenation lamp 30 is conducted to the heat dissipation duct 43 and absorbed by the heat dissipation airflow. The airflow that has absorbed heat continues to flow and is finally discharged from the wind outlet 412.

Optionally, the heat dissipation duct 43 is arranged on the side of the panel 12 that is relatively away from the ground and relatively close to the housing 11.

Referring to Figs. 17 and 18, the heat dissipation structure 40 further includes a heat dissipation member 44. The heat dissipation member 44 includes fins 441, wherein the fins 441 are arranged side by side at intervals on the side of the panel 12 away from the ground; the fins 441 are arranged on the heat dissipation duct 43, or the gaps between the fins 441 form the heat dissipation duct 43. The side of the rejuvenation lamp 30 away from the indoor space is thermally connected to the fins 441, and the side of the rejuvenation lamp 30 away from the indoor space forms a heat accumulation portion 32. The first wind opening 431 and the second wind opening 432 for forming the wind inlet 411 and the wind outlet 412 are respectively arranged at both ends of each fin 441.

Referring to Figs. 17 and 18, a gap between any two adjacent fins 441 is simply referred to as the fin gap 4411. The side walls of two adjacent fins 441 facing each other form part of the inner wall of the heat dissipation duct 43. The heat generated by the rejuvenation lamp 30 is absorbed by the fins 441. After the airflow passes through the fin gaps 4411, the airflow

absorbs the heat of the fins 441 and then is discharged from the heat dissipation duct 43 through the wind outlet 412. Subsequently, new gas continues to enter the air gap and continues to absorb heat. The above process is repeated to cool down the rejuvenation lamp 30.

Optionally, other methods can also be used to obtain the heat dissipation duct 43, not limited to using the fins 441. For example, pipes or structures with cavities can be used as the heat dissipation duct 43.

Referring to Figs. 16 and 17, the heat dissipation structure 40 further includes a wind driving member 421 arranged at the wind inlet 411. The wind driving member 421 may be a fan. After the wind driving member 421 is started, the volume and speed of the wind entering the heat dissipation duct 43 are increased, and thrust is provided to the airflow entering the heat dissipation duct 43 to prompt the airflow to flow towards the wind outlet 412 more quickly. As the airflow velocity in the heat dissipation duct 43 increases, the airflow absorbs and carries more heat, and the cooling efficiency is higher.

Optionally, the inner wall of the heat dissipation duct 43 is connected to an opening edge of the wind inlet 411 through a curved surface transition. Taking the embodiments shown in Figs. 16 and 17 as an example, the opening direction of the wind inlet 411 faces away from the panel 12. In the occasion where the installation space is limited, the wind inlet 411 opened in the direction facing away from the panel 12 can be designed to be larger, which is beneficial to increasing the wind intake volume.

The air regulation device 20 includes at least a first fan 21. Referring to Figs. 16 to 17, the first fan 21 can be a centrifugal fan installed in the housing 11 and located on the side of the panel 12 relatively away from the indoor space and the ground. When the first fan 21 is a centrifugal fan, the impeller center 2011 of the first fan 21 is also called the first impeller center 211, and the first impeller center 211 is arranged opposite to the opening of the wind outlet 412.

This means that after the first fan 21 operates, the airflow in the heat dissipation duct 43 will be directly blown towards the first impeller center 211 after being discharged from the wind outlet 412. The airflow that has absorbed heat and is discharged from the wind outlet 412 directly enters the first fan 21 and is finally discharged from the volute wind outlet of the

first fan 21.

The first fan 21 can be a centrifugal fan including a centrifugal impeller 201. The centrifugal impeller 201 includes a wheel disc and a plurality of blades installed on the wheel disc. The impeller center 2011 is an axis of the wheel disc, and the plurality of blades are spaced apart from one another around the impeller center 2011 along a circumferential direction of the wheel disc. Air holes are provided on the wheel disc to allow air to enter, and air gaps are formed between the blades. After the airflow is discharged from the wind outlet 412, the airflow enters the centrifugal impeller 201 through the air holes and then is discharged from the air gaps between the blades.

After the first fan 21 is started, a low-pressure area will be formed near the impeller center 2011. The air pressure in this area is significantly lower than the ambient air pressure and is also significantly lower than the air pressure on a periphery of the first fan 21.

The relative arrangement of the opening of the wind outlet 412 and the impeller center 2011 of the first fan 21 means that the opening of the wind outlet 412 is oriented in such a manner that the wind outlet 412 and the vicinity of the wind outlet 412 are within a low-pressure area formed by the first fan 21. The air pressure at the wind inlet 411 and the vicinity of the wind inlet 411 remains at an ambient air pressure or may even be higher than the ambient air pressure, thereby creating a pressure difference between the wind inlet 411 and the wind outlet 412, and resulting in a pressure drop in the heat dissipation duct 43.

Under the action of pressure difference and pressure drop, the gas entering the heat dissipation duct 43 will no longer maintain a static and constant state. Instead, the gas will spontaneously move away from the wind inlet 411 and flow towards the wind outlet 412 along the heat dissipation duct 43, so as to form a heat dissipation airflow, that is, the generation of the airflow used to cool the rejuvenation lamp 30 does not depend on the wind driving member 421. Even without the wind driving member 421, the first fan 21 can also form a heat dissipation airflow.

Compared with the wind blown by the wind driving member 421 into the heat dissipation duct 43, the heat dissipation airflow formed by the first fan 21 has stronger wind force and higher wind speed.

Based on the working characteristics of the first fan 21, the airflow discharged from the

heat dissipation duct 43 through the wind outlet 412 will finally be absorbed by the first fan 21. That is, the first fan 21 can not only promote rapid flow of the gas in the heat dissipation duct 43 to form a heat dissipation airflow, but also timely discharge the airflow that has absorbed the heat of the rejuvenation lamp 30 from the heat dissipation duct 43 to vacate the heat dissipation duct 43, thereby reducing the resistance for new air to enter the heat dissipation duct 43 and increasing the total amount of gas entering the heat dissipation duct 43.

Optionally, the first fan 21 and the wind driving member 421 can be set simultaneously. The coordinated cooperation between the first fan 21 and the wind driving member 421 can significantly increase the flow velocity and wind force of the air in the heat dissipation duct 43, and can significantly improve the ability of the heat dissipation airflow to absorb and carry the heat of the rejuvenation lamp 30.

Optionally, the wind driving member 421 can also be removed, and only the first fan 21 can be used to dissipate heat and cool the rejuvenation lamp 30.

Referring to Figs. 16 and 17, the first fan 21 and the heat dissipation duct 43 are located on the same side of the panel 12, that is, the first fan 21 and the heat dissipation duct 43 are both located on a side of the panel 12 relatively away from the ground. After the housing 11 is installed in the ceiling, the first fan 21 is located on a side of the ceiling relatively away from the ground and is invisible to users below the panel 12.

Optionally, the first fan 21, the heat dissipation duct 43, the rejuvenation lamp 30, and the panel 12 are stacked in sequence. After the housing 11 is installed on the ceiling, the first fan 21, the heat dissipation duct 43, the rejuvenation lamp 30, and the panel 12 are arranged in sequence along a vertical direction close to the ground.

Referring to Figs. 16 and 17, a center line of the opening of the wind outlet 412 is arranged parallel to the impeller center 2011 of the centrifugal impeller 201 of the first fan 21. The impeller center 2011 of the centrifugal impeller 201 of the first fan 21 is just the first impeller center 211 shown in Figs. 16 and 17. Moreover, the first impeller center 211 extends into the opening of the wind outlet 412.

The center line of the opening of the wind outlet 412 is an imaginary straight line. This straight line passes through a geometric center of the opening of the wind outlet 412, and an

extension direction of this straight line is consistent with an instantaneous velocity direction of the airflow flowing out of the wind outlet 412.

Optionally, referring to Figs. 16 and 17, the opening direction of the wind outlet 412 faces away from the panel 12. After the housing 11 is installed on the bathroom ceiling, the wind outlet 412 is provided vertically upwards, and the first impeller center 211 extends in the vertical direction. At this time, the center line of the opening of the wind outlet 412 is a straight line extending vertically. The opening shape of the wind outlet 412 is not limited and can be rectangular, square or other shapes.

If a plane perpendicular to the first impeller center 211 is defined as the airflow cross-sectional plane, the point where the first impeller center 211 is orthographically projected onto the airflow cross-sectional plane is located inside the figure where the wind outlet 412 is orthographically projected onto the airflow cross-sectional plane. As a result, the airflow discharged from the wind outlet 412 can blow towards the centrifugal impeller 201 to a greater extent and can be absorbed by the centrifugal impeller 201.

Optionally, the heat dissipation structure 40 further includes a wind outlet member 46 arranged on the heat dissipation duct 43. The wind outlet member 46 is provided with a wind outlet channel 461, wherein one end of the wind outlet channel 461 communicates the fin gap 4411 with the heat dissipation duct 43, and the other end of the wind outlet channel 461 forms a wind outlet 412. Referring to Fig. 16, the wind outlet channel 461 includes an upstream section extending along the panel 12 and the rejuvenation lamp 30, and also includes a downstream section extending towards the housing 11 and the first fan 21 in a direction away from the panel 12 and the rejuvenation lamp 30.

The upstream section communicates the fin gap 4411 with the heat dissipation duct 43; a tail end of the downstream section forms the wind outlet 412; and an inner wall of the upstream section and an inner wall of the downstream section are in curved surface transition. Therefore, the inner wall of the wind outlet channel 461 and the opening edge of the wind outlet 412 are in curved surface transition, so as to reduce the flow resistance of the heat dissipation airflow, and reduce the kinetic energy loss of the heat dissipation airflow.

Optionally, the heat dissipation structure 40 further includes a wind guiding portion 462 arranged on the heat dissipation duct 43. The wind guiding portion 462 protrudes outwards

along a wind outlet direction of the wind outlet 412 and extends in a direction close to the first fan 21. An inner wall of the wind outlet channel 461 and the opening edge of the wind outlet 412 are in curved surface transition through the wind guiding portion 462.

The wind outlet member 46 and the wind guiding portion 462 can perform final guidance and flow trajectory constraint on the airflow that is about to leave and has just left the wind outlet 412, such that the airflow can be concentrated and fully flow towards the first fan 21.

Optionally, referring to Fig. 16, the wind guiding portion 462 is formed at the end of the wind outlet member 46 that is relatively close to the first fan 21 and faces away from the panel 12. The wind outlet member 46 is a hollow sleeve-shaped structure, and the wind outlet member 46 protrudes relative to the panel 12 in a direction away from the panel 12, the rejuvenation lamp 30, and the indoor space.

The wind outlet member 46 and the wind guiding portion 462 can not only guide and restrict the flow trajectory of the heat dissipation airflow about to enter the first fan 21, but also reduce and suppress the entry of the gas outside the heat dissipation duct 43 into the first fan 21, thereby not only ensuring that the heat dissipation airflow that has absorbed heat can be obtained by the first fan 21 as much as possible to fully exhaust the gas in the heat dissipation duct 43, but also improving the utilization efficiency of the power of the first fan 21, such that more power of the first fan 21 is used to absorb and exhaust the heat-absorbed gas in the heat dissipation duct 43.

The heater shown in Figs. 19 to 22 is also a heater with a rejuvenation function. Compared with the electrical appliance 100 with a rejuvenation function shown in Figs. 16 to 17, in the embodiment shown in Figs. 19 to 22, the air regulation device 20 further includes a second fan 22 and an airflow channel 202 arranged in the housing 11, and the main body 10 is provided with a wind outlet window 125 communicating with the indoor space. One of the first wind opening 431 and the second wind opening 432 faces the wind inlet portion of the first fan 21, and the other of the first wind opening 431 and the second wind opening 432 faces the wind inlet portion of the second fan 22. At least the wind outlet portion of the first fan 21 is located in the airflow channel 202. The airflow channel 202 includes at least one wind outlet end 203, and each wind outlet end 203 is in communication with either the wind outlet window 125 or the outdoor space.

After the first fan 21 operates, a low-pressure area is formed near the wind inlet portion of the first fan 21. In particular, the air pressure near the first impeller center 211 is significantly low, such that the air pressure of one of the first wind opening 431 and the second wind opening 432 facing the first fan 21 is lower than the air pressure of the other, and a pressure difference is formed at both ends of the heat dissipation duct 43. Under the action of the pressure difference, the gas enters the heat dissipation duct 43 and then flows towards one of the first wind opening 431 and the second wind opening 432 facing the first fan 21 to form the heat dissipation airflow.

The second fan 22 may be a centrifugal fan including a centrifugal impeller 201. The centrifugal impeller 201 includes a wheel disc and a plurality of blades mounted on the wheel disc. The impeller center 2011 is an axis of the wheel disc. The plurality of blades are spaced apart from one another along the circumferential direction of the wheel disc around the impeller center 2011. Air holes are provided on the wheel disc to allow the airflow to enter, and air gaps are formed between the blades. The air inlet portion of the centrifugal fan serves as the end of the centrifugal impeller 201, that is, an end face of the wheel disc. The wind outlet portion of the centrifugal fan is the periphery of the centrifugal impeller 201. A wind inlet opening is provided on the end of the centrifugal fan for gas to enter the centrifugal fan. The air gaps penetrate through the periphery of the centrifugal fan to allow the gas to easily leave from the periphery of the centrifugal fan.

Optionally, the centrifugal fan further includes a volute corresponding to the periphery of the centrifugal impeller 201. After the heat dissipation airflow which has absorbed heat flows out of the heat dissipation duct 43, the heat dissipation airflow flows into the centrifugal fan through the cross section of the wheel disc, then flows to the air gaps between the blades, and finally flows out of the periphery of the centrifugal impeller 201 and is discharged from the volute wind outlet of the centrifugal fan.

For the convenience of description, the following introduction will be based on the structure shown in Figs. 19 to 20. In the structure shown in Figs. 19 to 20, the first wind opening 431 faces the wind inlet portion of the first fan 21, and the second wind opening 432 is arranged relatively away from the first fan 21. When the air regulation device 20 also includes a second fan 22 installed in the housing 11, the second wind opening 432 faces the

wind inlet portion of the second fan 22.

When the first fan 21 is operating and the second fan 22 is not operating, it is difficult for the gas entering the heat dissipation duct 43 to maintain a static state, and will spontaneously move away from the second wind opening 432 and flow towards the first wind opening 431 along the heat dissipation duct 43. Therefore, there is no need to install a heat dissipation fan at the second wind opening 432 to form a heat dissipation airflow. Compared with the airflow generated by the heat dissipation fan, the heat dissipation airflow formed by the first fan 21 has stronger wind force and higher wind speed.

Based on the working characteristics of the centrifugal fan, the first fan 21 can quickly drain the gas which has absorbed heat in the heat dissipation duct 43 to vacate the heat dissipation duct 43, reduce the resistance for new air to enter the heat dissipation duct 43, and increase the total amount of new air entering the heat dissipation duct 43.

Optionally, the first wind opening 431 is arranged opposite to the first impeller center 211. The opening direction of the first wind opening 431 allows the first wind opening 431 to be located within a low-pressure area formed when the first fan 21 is brought into operation.

Optionally, the center line of the opening of the first wind opening 431 is parallel to the first impeller center 211, and the first impeller center 211 extends into the opening of the first wind opening 431. The center line of the opening of the first wind opening 431 is an imaginary straight line that passes through a geometric center of the opening of the first wind opening 431, and the extension direction of this straight line is consistent with the instantaneous velocity direction of the heat dissipation airflow flowing out of the first wind opening 431.

Optionally, after the housing 11 is installed in the ceiling space of the bathroom, the first fan 21, the heat dissipation duct 43, and the rejuvenation lamp 30 are sequentially arranged in a vertical direction close to the ground.

Referring to Figs. 19 to 20, the opening direction of the first wind opening 431 and the second wind opening 432 faces away from the ground. After the housing 11 is installed on the bathroom ceiling, the first wind opening 431 and the second wind opening 432 are opened vertically upwards, and the first impeller center 211 extends in a vertical direction.

Optionally, when the second fan 22 is a centrifugal fan, after the housing 11 is installed

on the bathroom ceiling, the impeller center 2011 of the second fan 22 extends in the vertical direction.

Optionally, the center line of the opening of the first wind opening 431 and the center line of the opening of the second wind opening 432 are both straight lines extending vertically. The opening shapes of the first wind opening 431 and the second wind opening 432 are not limited and can be circular, square, or other shapes.

If a plane perpendicular to the first impeller center 211 is defined as a first airflow cross-sectional plane, the point where the first impeller center 211 is orthographically projected onto the first airflow cross-sectional plane is located inside the figure where the first wind opening 431 is orthographically projected onto the first airflow cross-sectional plane. With such an arrangement, the heat dissipation airflow discharged from the first wind opening 431 can blow towards the wind inlet portion of the first fan 21 to a greater extent and can be more fully absorbed by the first fan 21.

Optionally, the airflow channel 202 includes a ventilation duct 23, and the wind outlet end 203 includes a ventilation discharge end 2031. The ventilation discharge end 2031 is located at an end of the ventilation duct 23 relatively away from the main body 10 and is in communication with the outdoor space. The airflow entering the ventilation duct 23 is finally discharged to the outdoor space from the ventilation discharge end 2031.

Optionally, the airflow channel 202 includes a wind-blowing duct 24, and the wind outlet end 203 includes a wind blowing discharge end 2032. The wind blowing discharge end 2032 is in communication with the wind outlet window 125, such that the wind blowing discharge end 2032 is in communication with the indoor space, and the airflow entering the wind blowing discharge end 2032 is finally discharged from the wind outlet window 125 into the indoor space.

Optionally, referring to Figs. 19 to 20 and Fig. 22, the airflow channel 202 includes both the ventilation duct 23 and the wind-blowing duct 24. The wind outlet end 203 includes the ventilation discharge end 2031 and the wind blowing discharge end 2032.

The wind outlet portion of the first fan 21 is simply referred to as the first wind outlet portion 212, and the wind outlet portion of the second fan 22 is simply referred to as the second wind outlet portion 222. After the heat dissipation airflow flows into the first fan 21, it

is discharged from the first wind outlet portion 212. When the wind outlet ends 203 are all in communication with the wind outlet window 125, the airflow will flow towards the wind outlet end 203 and is finally discharged from the wind outlet window 125 to the bathroom. At this time, all the airflow channels 202 are wind-blowing ducts 24. The first wind outlet portion 212 is located inside the wind-blowing duct 24. The first fan 21 realizes the function of air supply and blowing, and the air regulation device 20 operates in a blowing mode.

When the wind outlet ends 203 are all in communication with the outdoor space, the airflow will flow towards the wind outlet ends 203 and will be finally discharged to the outdoor space. At this time, all the airflow channels 202 are ventilation ducts 23. The first wind outlet portion 212 is located within the ventilation duct 23. The first fan 21 realizes the ventilation and wind outlet functions, and the air regulation device 20 operates in a ventilation mode.

When a plurality of wind outlet ends 203 are provided, one part of the wind outlet ends 203 is in communication with the wind outlet window 125, and the other part of the wind outlet ends 203 is in communication with the outdoor space. The airflow will be divided into two parts, wherein one part of the airflow is discharged into the indoor space from the wind outlet window 125, and the other part of the airflow is discharged to the outdoor space. At this time, the first fan 21 can simultaneously supply wind for blowing and perform ventilation and wind exhaust. The air regulation device 20 operates in both the blowing mode and the ventilation mode.

Therefore, the first fan 21 can not only serve as a power source for generating heat dissipation airflow, but also realize at least one of the functions of ventilation and wind exhaust or air supply and blowing.

Optionally, the airflow channel 202 includes a ventilation duct 23, a wind-blowing duct 24, and a common duct. At least the first wind outlet portion 212 is located within the common duct. Both the ventilation duct 23 and the wind-blowing duct 24 are in communication with the common duct. The wind outlet end 203 includes a ventilation discharge end 2031 and a wind blowing discharge end 2032. The ventilation discharge end 2031 is located at an end of the ventilation duct 23 away from the common duct, and the wind blowing discharge end 2032 is located at an end of the wind-blowing duct 24 relatively away

from the common duct.

The heat dissipation airflow leaving the heat dissipation duct 43 first flows into the common duct in a concentrated manner. After the first fan 21 starts to operate, the airflow quickly flows towards the air inlet portion of the first fan 21, and then leaves the first fan 21 from the first wind outlet portion 212. Afterwards, the airflow is divided into two parts, wherein one part of the airflow flows into the ventilation duct 23 and is finally discharged to the outdoor space; the other part of the airflow flows into the wind-blowing duct 24 and is finally discharged into the bathroom. Therefore, the first fan 21 has dual functions of ventilation and wind exhaust and wind supplying and blowing.

Optionally, the wind inlet portion of the first fan 21 is located in the common duct. After the first fan 21 is started, the air pressure in the common duct is firstly reduced. Under the action of the difference between internal pressure and external pressure, the airflow leaving the heat dissipation duct 43 is pushed into the common duct. In this way, the heat dissipation duct 43 can be quickly drained, thereby allowing more air to form a heat dissipation airflow and flow into the heat dissipation duct 43 in a concentrated manner.

Optionally, the air regulation device 20 further includes a wind damper movably arranged in the common duct. The wind damper can close either the ventilation duct 23 or the wind-blowing duct 24, and can also open both the ventilation duct 23 and the wind-blowing duct 24 simultaneously.

Therefore, the wind damper can choose to open either the ventilation duct 23 or the wind-blowing duct 24 to enable the air regulation device 20 to operate in either the wind-blowing mode or the ventilation mode. The ventilation duct 23 and the wind-blowing duct 24 can also be simultaneously opened to enable the air regulation device 20 to operate in both the wind-blowing mode and the ventilation mode.

In the embodiments shown in Figs. 19 to 22, the airflow channel 202 includes a ventilation duct 23 and a wind-blowing duct 24. The wind outlet end 203 includes a ventilation discharge end 2031 and a wind blowing discharge end 2032. The ventilation discharge end 2031 is located at an end of the ventilation duct 23 relatively away from the main body 10 and in communication with the outdoor space. The wind blowing discharge end 2032 is in communication with the wind outlet window 125, so as to be in communication

with the internal space of the bathroom. The first wind outlet portion 212 is located in the ventilation duct 23. The air regulation device 20 further includes a second fan 22, and the second wind outlet portion 222 is located in the wind-blowing duct 24.

Therefore, the first fan 21 and the second fan 22 operate in a division of labor. The first fan 21 serves as a power source for discharging exhaust gas in the bathroom to the outdoor space, and the second fan 22 serves as a power source for transporting airflow into the bathroom. When one of the first fan 21 and the second fan 22 malfunctions, it will not affect normal operation of the other.

Optionally, the first fan 21 and the second fan 22 are arranged side by side along the extension direction of the heat dissipation duct 43. The second fan 22 is a centrifugal fan, and the second wind opening 432 faces the air inlet portion of the second fan 22. The second wind outlet portion 222 is the periphery of the centrifugal impeller 201 of the second fan 22, and the air inlet portion of the second fan 22 is the end of the centrifugal impeller 201 of the second fan 22. The second wind opening 432 is arranged opposite to the impeller center 2011 of the second fan 22. The impeller center 2011 of the second fan 22 is an axis of the wheel disc of the centrifugal impeller 201 of the second fan 22, and is simply referred to as the second impeller center 221.

Therefore, when the first fan 21 is operating and the second fan 22 is not operating, a low-pressure area is only formed near the first impeller center 211. Air can enter the heat dissipation duct 43 through the second wind opening 432, then flow towards the first wind opening 431, and finally flow out of the heat dissipation duct 43 and flow into the first fan 21. The heat dissipation airflow flowing out of the first wind opening 431 is finally discharged to the outdoor space under the suction action of the first fan 21. When the second fan 22 is operating and the first fan 21 is not operating, a low-pressure area is only formed near the second impeller center 221. Air can enter the heat dissipation duct 43 through the first wind opening 431, then flow towards the second wind opening 432, and finally flow out of the heat dissipation duct 43 and flow into the second fan 22. The heat dissipation airflow flowing out of the second wind opening 432 is finally discharged into the bathroom under the suction action of the second fan 22.

It is also possible to select only one of the first fan 21 and the second fan 22 to generate a

heat dissipation airflow. When the first fan 21 and the second fan 22 operate simultaneously, both the first wind opening 431 and the second wind opening 432 are possibly in a low-pressure state. At this time, it is difficult to form a large pressure difference at both ends of the heat dissipation duct 43. Therefore, it is difficult to generate a heat dissipation airflow in the heat dissipation duct 43.

Referring to Figs. 19 to 20, the heat dissipation structure 40 further includes a wind outlet member 46. The wind outlet member 46 is arranged at the first wind opening 431. The wind outlet member 46 protrudes outwards from the heat dissipation duct 43 and extends in a direction close to the first fan 21 in the direction away from the ground, such that the distance d between the wind outlet member 46 and the wind inlet portion of the first fan 21 is smaller than the distance c between the second wind opening 432 and the wind inlet portion of the second fan 22.

Therefore, it can be ensured that more air flowing into the second fan 22 comes from the bathroom, and the amount of gas flowing out of the heat dissipation duct 43 and flowing into the second fan 22 is reduced. At the same time, guided by the wind outlet member 46, more heat dissipation airflow in the heat dissipation duct 43 will flow out from the first wind opening 431 and flow into the first fan 21. The wind outlet member 46 can also play a certain blocking role in preventing the gas in the bathroom from flowing into the first fan 21. Therefore, the purpose of mainly relying on the first fan 21 to promote the formation of heat dissipation airflow is achieved.

Optionally, the wind outlet member 46 can also be arranged at the second wind opening 432. Specifically, the wind outlet member 46 is arranged at one of the first wind opening 431 and the second wind opening 432 that faces the first fan 21.

When the air regulation device 20 operates in the blowing mode, it can either discharge room-temperature (15°C to 25°C) airflow into the bathroom or discharge warm airflow above 25°C into the bathroom. In order to enable the air regulation device 20 to discharge warm airflow into the bathroom, the air regulation device 20 further includes a heater. The heater is installed in the wind-blowing duct 24 and is configured to heat the airflow entering the wind-blowing duct 24 to form warm airflow.

When the air regulation device 20 includes a heater arranged in the wind-blowing duct

24, the first wind outlet portion 212 is arranged in the ventilation duct 23, and the rejuvenation lamp 30 is coupled to the first fan 21, such that the first fan 21 can be triggered to start running after the rejuvenation lamp 30 operates. Therefore, when the rejuvenation lamp 30 operates, the first fan 21 must operate, and the air regulation device 20 operates in the blowing mode and the ventilation mode. Although the second fan 22 discharges warm airflow into the bathroom at this time, at least part of the high-temperature gas in the bathroom can still be discharged to the outdoor space. Therefore, the temperature in the bathroom can still be maintained at a relatively low level, thereby preventing the temperature of the heat dissipation airflow flowing through the heat dissipation duct 43 from being too high due to the excessively high air temperature, and preventing the problem of poor cooling effect of the rejuvenation lamp 30.

Optionally, the main body 10 is provided with a first airflow inlet 131 in communication with the airflow channel 202. Referring to Figs. 19 to 20, the wind inlet portion of the first fan 21 is exposed through the first airflow inlet 131. The first wind opening 431 faces the wind inlet portion of the first fan 21 and is thus arranged opposite to the first airflow inlet 131. The opening area of the first wind opening 431 is larger than the area of the wind inlet portion of the first fan 21.

Optionally, the opening area of the first wind opening 431 is larger than the opening area of the wind inlet 411 of the wind inlet portion of the first fan 21.

In the embodiment shown in Fig. 20, both the first wind opening 431 and the first airflow inlet 131 are circular openings. The opening diameter of the first wind opening 431 is b , and the opening diameter of the first airflow inlet 131 is a , where b is greater than a .

Optionally, the wind outlet member 46 has an annular structure. An opening edge of the end of the wind outlet member 46 relatively close to the first fan 21 forms the opening of the first wind opening 431. The diameter b is an inner diameter of the end of the wind outlet member 46 relatively close to the first fan 21.

Therefore, it can be fully ensured that all the heat dissipation airflow flowing out of the heat dissipation duct 43 can flow into the first fan 21 under the suction action of the first fan 21, which is beneficial to maximizing the flow rate of the heat dissipation airflow. As a result, a larger amount of heat dissipation airflow can enter the heat dissipation duct 43 to achieve a

more significant heat dissipation effect.

In the embodiments shown in Figs. 19 to 20 and Fig. 22, the airflow channel 202 includes a wind-blowing duct 24 and a ventilation duct 23 that are separated from each other. The first airflow inlet 131 is in communication with the ventilation duct 23. The main body 10 is also provided with a second airflow inlet 132 that is in communication with the wind-blowing duct 24. At least part of the ventilation duct 23 is located inside the main body 10, and at least part of the wind-blowing duct 24 is also located inside the main body 10. Both the first airflow inlet 131 and the second airflow inlet 132 are provided on a side of the housing 11 relatively close to the ground.

Optionally, the first airflow inlet 131 and the second airflow inlet 132 are provided on the side of the housing 11 that is relatively close to the panel 12, the rejuvenation lamp 30, and the indoor space.

In the embodiments shown in Figs. 19 to 21 and Fig. 22, part of the air in the bathroom directly enters the wind-blowing duct 24 from the second airflow inlet 132. Then, driven by the second fan 22, a blowing airflow is formed. The blowing airflow will be discharged into the bathroom again through the wind outlet window 125. Most of the air forming the blowing airflow does not flow through the heat dissipation duct 43. The other part of the air in the bathroom will first flow into the heat dissipation duct 43 to form a heat dissipation airflow. After the heat dissipation airflow absorbs the heat of the rejuvenation lamp 30, it leaves the heat dissipation duct 43. Then, driven by the first fan 21, the airflow flows into the ventilation duct 23 from the first airflow inlet 131 and is finally discharged to the outdoor space.

Optionally, after the housing 11 is installed on the bathroom ceiling, both the first fan 21 and the second fan 22 are arranged inside the housing 11. The housing 11, the heat dissipation duct 43, and the rejuvenation lamp 30 are sequentially arranged in a vertical direction close to the ground. The opening direction of the second wind opening 432 faces away from the ground. After the housing 11 is installed on the bathroom ceiling, the second wind opening 432 is provided vertically, and the second impeller center 221 extends in the vertical direction.

Optionally, the center line of the opening of the second wind opening 432 is parallel to the second impeller center 221, and the second impeller center 221 extends into the opening of the second wind opening 432. The center line of the opening of the second wind opening

432 is an imaginary straight line that passes through a geometric center of the second wind opening 432, and the extension direction of this straight line is parallel to the center line of the opening of the first wind opening 431.

If a plane perpendicular to the second impeller center 221 is defined as a second airflow cross-sectional plane, the point where the second impeller center 221 is orthographically projected onto the second airflow cross-sectional plane is located inside the figure where the second wind opening 432 is orthographically projected onto the second airflow cross-sectional plane. With such an arrangement, when the second fan 22 is responsible for generating the heat dissipation airflow, the heat dissipation airflow discharged from the second wind opening 432 can blow towards the wind inlet portion of the second fan 22 to a greater extent and can be more fully obtained by the second fan 22.

Optionally, the first fan 21, the second fan 22, at least part of the ventilation duct 23, and at least part of the wind-blowing duct 24 are all arranged on the side of the panel 12 away from the ground. As shown in Fig. 22, at least part of the ventilation duct 23 and at least part of the wind-blowing duct 24 are both located inside the housing 11.

Optionally, the wind outlet window 125 can be arranged either on the housing 11, or on the panel 12, or between the housing 11 and the panel 12. For example, the wind outlet window 125 can be located between the bottom of the housing 11 and the side of the panel 12 relatively close to the bottom of the housing 11.

Claims

1. An electrical appliance with a rejuvenation function, comprising a main body, an air regulation device arranged on the main body, a rejuvenation lamp arranged on the main body, and a heat dissipation structure connected to the rejuvenation lamp.

2. The electrical appliance with a rejuvenation function according to claim 1, wherein the rejuvenation lamp comprises a heat accumulation portion; the heat dissipation structure comprises a heat dissipation chamber and a fluid driving member; the heat dissipation chamber is connected to the heat accumulation portion; and the fluid driving member is configured to drive fluid to flow in the heat dissipation chamber.

3. The electrical appliance with a rejuvenation function according to claim 2, wherein the heat dissipation chamber comprises a wind inlet and a wind outlet that are in communication with each other; the fluid driving member comprises a wind driving member; and the wind driving member is arranged at one of the wind inlet and the wind outlet.

4. The electrical appliance with a rejuvenation function according to claim 2, wherein the heat dissipation structure further comprises a heat dissipation member connected to the heat accumulation portion; the heat dissipation member is configured as follows: the heat dissipation member comprises a plurality of fins spaced apart from one another; and/or the heat dissipation member is arranged in the heat dissipation chamber.

5. The electrical appliance with a rejuvenation function according to claim 2, wherein the rejuvenation lamp comprises a light-emitting portion; the heat dissipation structure further comprises a covering member that is covered on a side of the rejuvenation lamp facing away from the light-emitting portion; and the heat dissipation chamber is formed on a side of the covering member relatively close to the rejuvenation lamp.

6. The electrical appliance with a rejuvenation function according to claim 1, wherein the main body comprises a panel provided with the rejuvenation lamp, and further comprises an enclosure portion arranged on a side of the panel away from an indoor space; the enclosure portion has an installation space; the installation space is provided with a wind delivery opening leading to the heat accumulation portion of the rejuvenation lamp; the heat dissipation structure comprises a wind driving member; and the wind driving member is at least partially arranged in the installation space and is configured to drive air to flow out of

the installation space through the wind delivery opening and flow towards the heat accumulation portion.

7. The electrical appliance with a rejuvenation function according to claim 6, wherein the main body further comprises a housing and a spacer; the panel and the rejuvenation lamp are arranged on one side of the spacer; and the other side of the spacer and the housing together enclose an inner cavity that accommodates the air regulation device.

8. The electrical appliance with a rejuvenation function according to claim 7, wherein the heat dissipation structure comprises the wind driving member arranged within the housing; the housing has the installation space and forms the enclosure portion; and/or

the enclosure portion comprises a hollow boss; the hollow boss has a hollow channel and at least part of the wind driving member is sleeved by the hollow boss through the hollow channel; and the wind delivery opening is an opening at an end of the hollow channel relatively close to the panel.

9. The electrical appliance with a rejuvenation function according to claim 8, wherein the enclosure portion comprises the hollow boss; the hollow boss has the hollow channel and at least part of the wind driving member is sleeved by the hollow boss through the hollow channel; and the wind delivery opening is an opening at the end of the hollow channel relatively close to the panel; and

the hollow boss is arranged on the spacer; the hollow channel penetrates through both sides of the spacer; and the heat dissipation structure further comprises a heat dissipation chamber formed between the panel and spacer.

10. The electrical appliance with a rejuvenation function according to claim 8, wherein the hollow boss is located inside the housing, and the hollow channel is in communication with the inner cavity; or,

the hollow boss is located on a side of the spacer away from the panel; the hollow boss is located outside the inner cavity; and the hollow channel is in communication with a space outside the housing.

11. The electrical appliance with a rejuvenation function according to any one of claims 6 to 10, wherein the main body is provided with a heat dissipation air inlet, and is internally provided with an inner cavity that is in communication with the installation space; the heat

dissipation air inlet communicates the inner cavity with a space outside the main body, thereby allowing the wind driving member to draw air from the space outside the main body into the installation space.

12. The electrical appliance with a rejuvenation function according to claim 11, wherein the main body comprises a grille; the heat dissipation air inlet is provided in the grille; and a side of the grille facing away from the inner cavity is inclined to face away from the ground.

13. The electrical appliance with a rejuvenation function according to claim 6, wherein the main body further comprises a covering member and a hollow flange connected to the enclosure portion; the covering member is covered on a side of the panel away from the indoor space, and the covering member and the panel together enclose the heat dissipation chamber; the covering member comprises a butt-joint portion; the butt-joint portion is provided with a butt-joint opening that is in communication with the heat dissipation chamber; and one of the hollow flange and the butt-joint portion is sleeved on the other of the hollow flange and the butt-joint portion to communicate the wind delivery opening with the butt-joint opening.

14. The electrical appliance with a rejuvenation function according to claim 1, wherein the air regulation device comprises a first fan arranged on the main body; the first fan is a centrifugal fan; the heat dissipation structure comprises a heat dissipation duct connected to the rejuvenation lamp; the heat dissipation duct comprises a first wind opening and a second wind opening; one of the first wind opening and the second wind opening forms a wind inlet, while the other of the first wind opening and the second wind opening forms a wind outlet; and an opening of the wind outlet is arranged opposite to an impeller center of the first fan.

15. The electrical appliance with a rejuvenation function according to claim 14, wherein the main body comprises a panel provided with the rejuvenation lamp; the first fan and the heat dissipation duct are both located on the same side of the panel; and the first fan, the heat dissipation duct, the rejuvenation lamp, and the panel are installed in a stacked manner in sequence.

16. The electrical appliance with a rejuvenation function according to claim 15, wherein the heat dissipation structure comprises a wind outlet member arranged on the heat dissipation duct; the wind outlet member protrudes outwards along a wind outlet direction of the wind

outlet and extends in a direction close to the first fan; and the wind outlet is in communication with the interior of the wind outlet member.

17. The electrical appliance with a rejuvenation function according to any one of claims 14 to 16, wherein a center line of an opening of the wind outlet is arranged parallel to a center line of the impeller center; and/or the impeller center extends into an opening of the wind outlet.

18. The electrical appliance with a rejuvenation function according to any one of claims 14 to 16, wherein the main body is provided with a wind outlet window that is in communication with an indoor space; the air regulation device further comprises an airflow channel; one of the first wind opening and the second wind opening faces an air inlet portion of the first fan; a wind outlet portion of the first fan is located within the airflow channel; the airflow channel comprises at least one wind outlet end; and each of the at least one wind outlet end is in communication with the wind outlet window or an outdoor space.

19. The electrical appliance with a rejuvenation function according to claim 18, wherein the airflow channel comprises a ventilation duct and a wind-blowing duct, and the wind outlet portion of the first fan is located within the ventilation duct;

the air regulation device further comprises a second fan; the second fan is a centrifugal fan; and a wind outlet portion of the second fan is located within the wind-blowing duct;

the first wind opening faces the wind inlet portion of the first fan and is arranged opposite to the impeller center of the first fan; and the second wind opening faces a wind inlet portion of the second fan and is arranged opposite to an impeller center of the second fan; and

the at least one wind outlet end comprises a ventilation discharge end and a wind blowing discharge end; the ventilation discharge end is located at an end of the ventilation duct away from the main body; and the wind blowing discharge end is in communication with the wind outlet window.

20. The electrical appliance with a rejuvenation function according to claim 18, wherein the airflow channel comprises a ventilation duct; the wind outlet portion of the first fan is located inside the ventilation duct; the wind outlet end comprises a ventilation discharge end in communication with the outdoor space; the ventilation discharge end is located at an end of the ventilation duct away from the main body; and the rejuvenation lamp is coupled to the

first fan, such that the first fan can be activated for operation after the rejuvenation lamp is brought into operation.

21. The electrical appliance with a rejuvenation function according to claim 18, further comprising a wind outlet member, wherein the wind outlet member is arranged at one of the first wind opening and the second wind opening that faces the first fan; and the wind outlet member protrudes outwards from the heat dissipation duct and extends in a direction close to the first fan;

the airflow channel comprises a ventilation duct and a wind-blowing duct, wherein the wind outlet portion of the first fan is located in the ventilation duct; the air regulation device further comprises the second fan; and a wind outlet portion of the second fan is located in the wind-blowing duct;

the at least one wind outlet end comprises a ventilation discharge end and a wind blowing discharge end, wherein the ventilation discharge end is located at an end of the ventilation duct away from the main body, and the wind blowing discharge end is in communication with the wind outlet window; and

the distance from the wind outlet member to the wind inlet portion of the first fan is d ; the other one of the first wind opening and the second wind opening faces a wind inlet portion of the second fan; and the distance from said other one of the first wind opening and the second wind opening that faces the second fan to the wind inlet portion of the second fan is c , and d is less than c .

22. The electrical appliance with a rejuvenation function according to claim 1, wherein the main body comprises a volute, a wind-collecting plate, a panel and a movable baffle; the volute has a volute passage therein; the wind-collecting plate is arranged between the volute and the panel; the panel is provided with the rejuvenation lamp; a cavity is formed between the panel and the wind-collecting plate; the panel is formed with an air inlet that is in communication with the volute passage; the wind-collecting plate is provided with a heat dissipation hole; air in the volute passage is able to enter the cavity through the heat dissipation hole; and the movable baffle is configured to close or open the heat dissipation hole.

23. The electrical appliance with a rejuvenation function according to claim 22, wherein the volute passage has a wind-blowing duct and a ventilation duct; at least two movable baffles are provided, at least one movable baffle is arranged in the wind-blowing duct and at least one movable baffle is arranged in the ventilation duct, respectively; and one heat dissipation hole is arranged to correspond to each of the movable baffles.

24. The electrical appliance with a rejuvenation function according to claim 22, wherein the volute passage has a wind-blowing duct; the movable baffle is arranged in the wind-blowing duct, and the heat dissipation hole is arranged to correspond to the movable baffle.

25. The electrical appliance with a rejuvenation function according to claim 23 or 24, wherein the panel is further provided with an air outlet; a heating device is further arranged in the wind-blowing duct; the heating device comprises a heating structure and an output pipe; an opening end of the heating structure is in communication with the wind-blowing duct; an output end of the heating structure is in communication with one end of the output pipe; the other end of the output pipe is connected to the air outlet; and the movable baffle in the wind-blowing duct is arranged on a front side of the opening end of the heating structure.

26. The electrical appliance with a rejuvenation function according to claim 22, wherein an opening height h of the movable baffle is less than or equal to $H/6$, and H is the height of the volute passage.