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(54) **ELECTRIC CABINET OF AIR CONDITIONER AND AIR CONDITIONER HAVING THE SAME**

(57) An electric cabinet of an air conditioner, comprising a box body (1), a bottom plate (2), and a ventilation cover plate (3). The bottom plate (2) is installed at the bottom of the box body (1) and the ventilation cover plate (3) is installed at the bottom of the bottom plate (2), forming a cavity (4) with the bottom plate (2). Air vents (21) are provided on the bottom plate (2) and shutters (31)

are provided on the ventilation cover plate (3) with the shutters (31) aligned with the air vents (21) on the bottom plate (2). This apparatus reduces air duct resistance and accelerates heat dissipation inside the electronic cabinet body. The shutters (31) can also achieve the purpose of waterproof and rainproof while improving the ventilation and heat dissipation effect inside the electric cabinet.

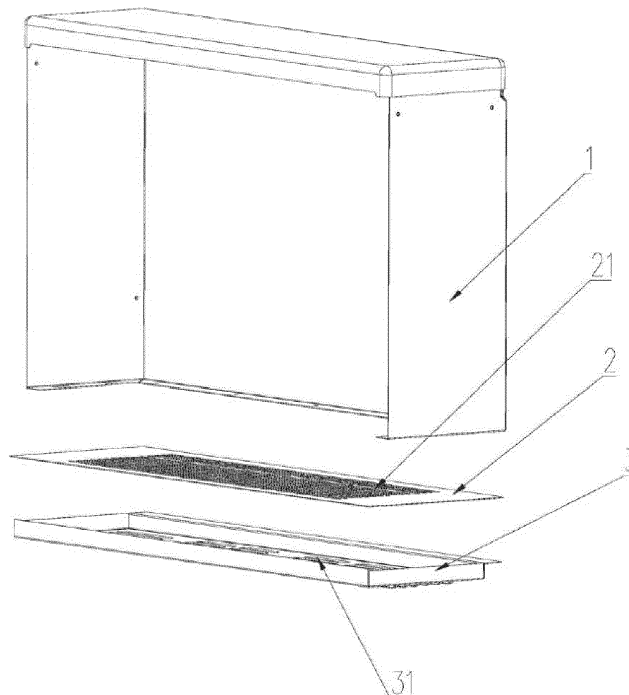


FIG. 1

Description

[0001] The present invention relates to the technical field of air conditioning devices, especially to an electric cabinet of an air conditioner.

[0002] When an air-conditioning device is running for a long time, electronic components inside the electric cabinet will generate heat. When the heat cannot be dissipated or the heat dissipation is not good, it will seriously affect the normal operation of the machine and the service life of the electronic components. Moreover, air-conditioning equipment will also be installed outdoors, facing the problem of waterproof and rainproof. In conventional compact electric cabinets, some only consider heat dissipation, and some are able to perform heat dissipation and rain protection at the same time. However, the heat dissipation channel is small, resulting in poor heat dissipation; and the design of an air duct structure is defective. In order to prevent rainwater from entering the inside of the electric cabinet, air vents are designed to be misplaced, which causes the air duct of the box body to be blocked, affecting the heat dissipation efficiency of the electric cabinet body.

[0003] A main purpose of the present invention is to provide an electric cabinet of an air conditioner and an air conditioner having the same, which solves the technical problem of low heat dissipation efficiency while preventing rain in the prior art.

[0004] According to a first aspect, the present invention provides an electric cabinet of an air conditioner, comprising a box body, a bottom plate, and a ventilation cover plate, wherein the bottom plate is installed at the bottom of the box body, the ventilation cover plate is installed at the bottom of the bottom plate and forms a cavity with the bottom plate; air vents are provided on the bottom plate, shutters are provided on the ventilation cover plate, and the shutters are aligned with the air vents on the bottom plate.

[0005] Optionally, there are a plurality of air vents, and the plurality of air vents are closely arranged on the bottom plate.

[0006] Optionally, sizes and shapes of the air vents are different from each other.

[0007] Optionally, slats of the shutters are opened downwards.

[0008] Optionally, air inlets and air outlets are formed between the slats of the shutters and the ventilation cover plate, and the air outlets are aligned with the air vents.

[0009] Optionally, the air outlets are communicated with the cavity.

[0010] Optionally, there are a plurality of shutters, and the plurality of shutters are arranged in an array on the ventilation cover plate.

[0011] Optionally, the air outlets of the shutters are each aligned with at least one air vent.

[0012] Optionally, the slats of the plurality of shutters are opened in the same direction.

[0013] Viewed from another aspect, the present inven-

tion further provides an air conditioner comprising the electric cabinet of an air conditioner.

[0014] In an electric cabinet of an air conditioner and an air conditioner having the same provided in the present invention, air vents are arranged on a bottom plate, shutters are arranged on a ventilation cover plate, a cavity is formed between the bottom plate and the ventilation cover plate, and the air vents are aligned with the shutters, which can reduce air duct resistance and accelerate heat dissipation inside the electronic cabinet body. The shutters can also achieve the purpose of waterproof and rainproof while improving the ventilation and heat dissipation effect inside the electric cabinet.

[0015] Certain exemplary embodiments will now be described in greater detail by way of example only and with reference to the accompanying drawings in which:

FIG. 1 is an exploded view of an electric cabinet of an air conditioner;

FIG. 2 is a schematic cross section of an electric cabinet of an air conditioner;

FIG. 3 is an enlarged schematic diagram of a wind field in area B of FIG. 2;

FIG. 4 is an enlarged schematic diagram of a wind field and a rainwater path in area B of FIG. 2; and
FIG. 5 is a schematic structural diagram of a ventilation cover plate.

[0016] In the drawings, box body 1, bottom plate 2, air vent 21, ventilation cover plate 3, shutter 31, air inlet 311, air outlet 312, cavity 4 are shown.

[0017] The realization of the purpose, functional characteristics, and advantages of the present invention will be further described in conjunction with the embodiments and with reference to the accompanying drawings.

[0018] With reference to FIGs. 1 and 2, the present invention provides an electric cabinet of an air conditioner, comprising box body 1, bottom plate 2, and ventilation cover plate 3. Bottom plate 2 is installed at the bottom of box body 1, ventilation cover plate 3 is installed at the bottom of bottom plate 2 and forms cavity 4 with bottom plate 2. Air vents 21 are provided on bottom plate 2, shutters 31 are provided on ventilation cover plate 3, and shutters 31 are aligned with air vents 21 on bottom plate 2.

[0019] Box body 1 is used to install and electrically control main electronic components, circuit boards, etc.; bottom plate 2 is used for air intake and protection; and ventilation cover plate 3 is mainly used for ventilation, heat dissipation, and rain prevention of the electric cabinet.

[0020] Shutters 31 are aligned with air vents 21 on bottom plate 2. It may be understood that after entering cavity 4 from shutters 31, wind may directly flow out through air vents 21 since shutters 31 are aligned with air vents 21, thereby reducing air duct resistance and improving heat dissipation efficiency of the electric cabinet.

[0021] It should be noted that the electrical components in the electric cabinet are compactly arranged and generate a large amount of heat. Electrical components

under high temperature have great safety risks. After ventilation, the heat of electrical components can be taken away in time to prevent the electrical components from being damaged under high temperature. As shown in FIG. 4, a plurality of air vents 21 are arranged on bottom plate 2 in a spaced way, and shutters 31 are arranged in an array on ventilation cover plate 3. Wind flows into cavity 4 from the direction of the arrow shown in the figure, and may flow directly from air vents 21 into box body 1 without turning to cool down the electrical components inside the electric cabinet. Hence, by aligning air vents 21 with shutters 31, the air duct resistance can be effectively reduced, and the heat dissipation efficiency of the electric cabinet can be improved. Moreover, shutters 31 can effectively prevent water vapor from entering box body 1 which damages the electrical components and affects the normal operation of the air conditioner.

[0022] Optionally, there are a plurality of air vents 21, and the plurality of air vents 21 are closely arranged on bottom plate 2.

[0023] After wind enters cavity 4 from shutters 31, it flows out from the plurality of air vents 21 arranged on bottom plate 2. The more the air vents 21 are, the faster the wind flows out, which can further improve the heat dissipation efficiency of the electric cabinet, making the ventilation and heat dissipation effect of the electric cabinet better.

[0024] Optionally, sizes and shapes of air vents 21 are different from each other.

[0025] There are a plurality of air vents 21 with different sizes and shapes. Air vents 21 can be set larger in some parts where strong heat dissipation is required, so as to speed up wind from air vents 21 into box body 1 and improve the heat dissipation efficiency of the electric cabinet.

[0026] Optionally, slats of shutters 31 are opened downwards.

[0027] As shown in FIG. 5, the slats of shutters 31 are opened downwards and form a certain angle with box body 1, thus preventing rainwater from entering cavity 4 and then entering box body 1 when rain is falling, so as to prevent rainwater from damaging the components in box body 1.

[0028] Optionally, air inlets 311 and air outlets 312 are formed between the slats of shutters 31 and ventilation cover plate 3, and air outlets 312 are aligned with air vents 21.

[0029] As shown in FIG. 5, wind enters cavity 4 through air inlets 311 and air outlets 312 of shutters 31. Because air outlets 312 are aligned with air vents 21, wind may flow directly from air vents 21 into box body 1 without turning to improve the heat dissipation effect of the internal components of the electric cabinet.

[0030] Optionally, air outlets 312 are communicated with cavity 4.

[0031] Air outlets 312 on shutters 31 are communicated with cavity 4, thus wind enters from air inlets 311 and flows directly into cavity 4, and then flows into box body

1 through air vents 21 to conduct heat dissipation for the electrical components in box body 1.

[0032] Optionally, there are a plurality of shutters 31, and the plurality of shutters 31 are arranged in an array on ventilation cover plate 3.

[0033] As shown in FIG. 3, there are a plurality of shutters 31; wind enters cavity 4 from shutters 31 and then enters box body 1 to conduct heat dissipation for the components, and therefore, setting the number of shutters 31 as multiple can increase the air volume, so that more wind can be achieved inside box body 1, and the heat dissipation efficiency of the electric cabinet can be further improved.

[0034] Optionally, air outlets 312 of shutters 31 are each aligned with at least one air vent 21.

[0035] Hence, all the wind entering from shutters 31 can flow into box body 1 directly through air vents 21 without turning in cavity 4 to conduct heat dissipation for the components in box body 1 and improve the heat dissipation efficiency.

[0036] Optionally, the slats of the plurality of shutters 31 are opened in the same direction.

[0037] As shown in FIG. 5, the slats of the plurality of shutters 31 are arranged in the same direction. When rainwater is falling, it can prevent rainwater from entering cavity 4 and then entering box body 1, avoiding that part of rainwater enters box body 1 from air inlets 311 when shutters 31 are opened in the reverse direction, causing damage to the components in box body 1.

[0038] An air conditioner can be provided, and the air conditioner is provided with the above electric cabinet of an air conditioner. Since the air conditioner has the above electric cabinet of an air conditioner, and the electric cabinet of an air conditioner has above advantages, by setting the electric cabinet of an air conditioner, the air conditioner has corresponding advantages. Therefore, the air conditioner of this embodiment has good ventilation and heat dissipation effects, good electric control and rainproof effects, low air duct resistance, and high electric cabinet heat dissipation efficiency.

[0039] It should be noted that the terms "comprise," "include," or any other variants thereof herein are intended to cover non-exclusive inclusion, thus a process, a device, an article, or a method that includes a series of elements not only includes those elements, but also includes other elements that are not explicitly listed, or also includes elements inherent to such a process, device, article, or method. If there are no more restrictions, the element defined by the sentence "comprising a..." does not exclude the existence of other identical elements in the process, device, article, or method that includes the element.

[0040] The above description is only concerned with preferred embodiments of the present invention, and do not limit the patent scope of the present invention, which is instead as defined by the appended claims. Any equivalent structure or equivalent process transformation made by using the content of the description and draw-

ings of the present invention, or directly or indirectly used in other related technical fields, are similarly included in the scope of patent protection of the present invention, as defined by the appended claims.

an air conditioner according to any preceding claim.

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Claims

1. An electric cabinet of an air conditioner, comprising a box body (1), a bottom plate (2), and a ventilation cover plate (3), wherein the bottom plate (2) is installed at the bottom of the box body (1), the ventilation cover plate (3) is installed at the bottom of the bottom plate (2) and forms a cavity (4) with the bottom plate (2); air vents (21) are provided on the bottom plate (2), shutters (31) are provided on the ventilation cover plate (3), and the shutters (31) are aligned with the air vents (21) on the bottom plate (2). 10
2. The electric cabinet of an air conditioner according to claim 1, wherein there are a plurality of air vents (21), and the plurality of air vents (21) are closely arranged on the bottom plate (2). 15
3. The electric cabinet of an air conditioner according to claim 1 or 2, wherein sizes and shapes of the air vents (21) are different from each other. 20
4. The electric cabinet of an air conditioner according to any preceding claim, wherein slats of the shutters (31) are opened downwards. 25
5. The electric cabinet of an air conditioner according to claim 4, wherein air inlets (311) and air outlets (312) are formed between the slats of the shutters (31) and the ventilation cover plate (3), and the air outlets (312) are aligned with the air vents (21). 30
6. The electric cabinet of an air conditioner according to claim 5, wherein the air outlets (312) are communicated with the cavity (4). 35
7. The electric cabinet of an air conditioner according to any of claims 4 to 6, wherein there are a plurality of shutters (31), and the plurality of shutters (31) are arranged in an array on the ventilation cover plate (3). 40
8. The electric cabinet of an air conditioner according to any of claims 5 to 7, wherein the air outlets (312) of the shutters (31) are each aligned with at least one air vent (21). 45
9. The electric cabinet of an air conditioner according to any of claims 4 to 8, wherein the slats of the plurality of shutters (31) are opened in the same direction. 50
10. An air conditioner, comprising the electric cabinet of 55

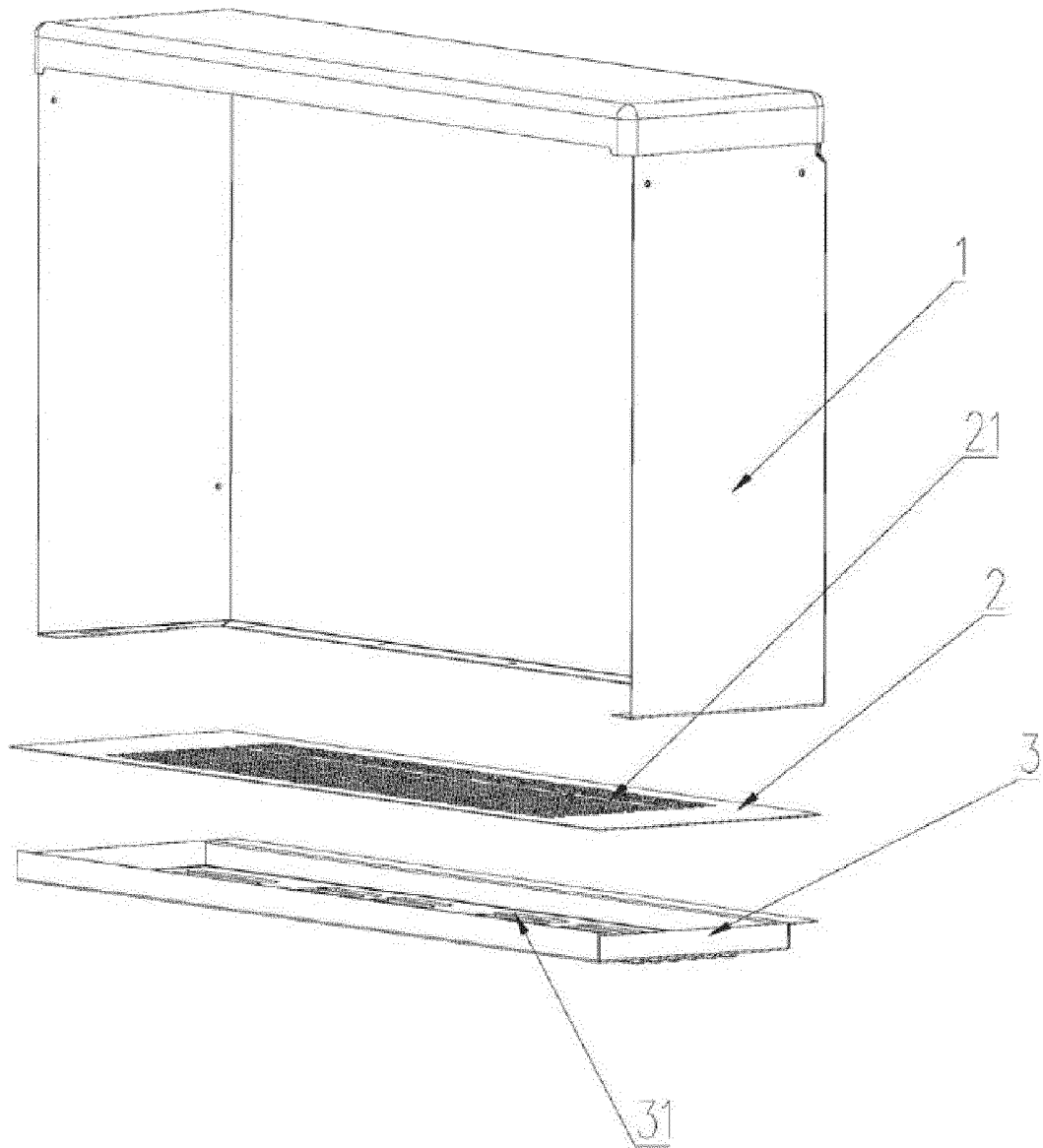


FIG. 1

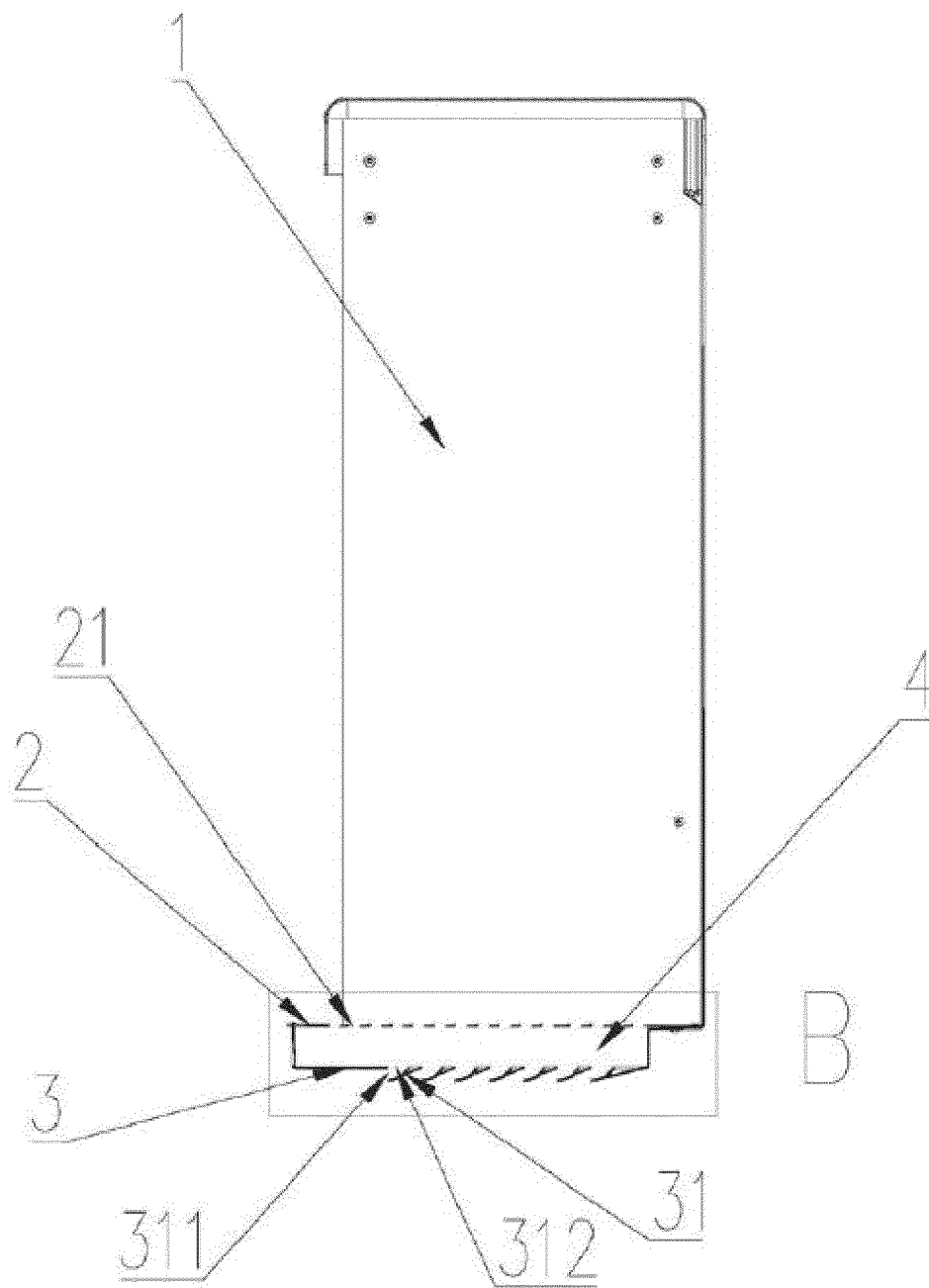


FIG. 2

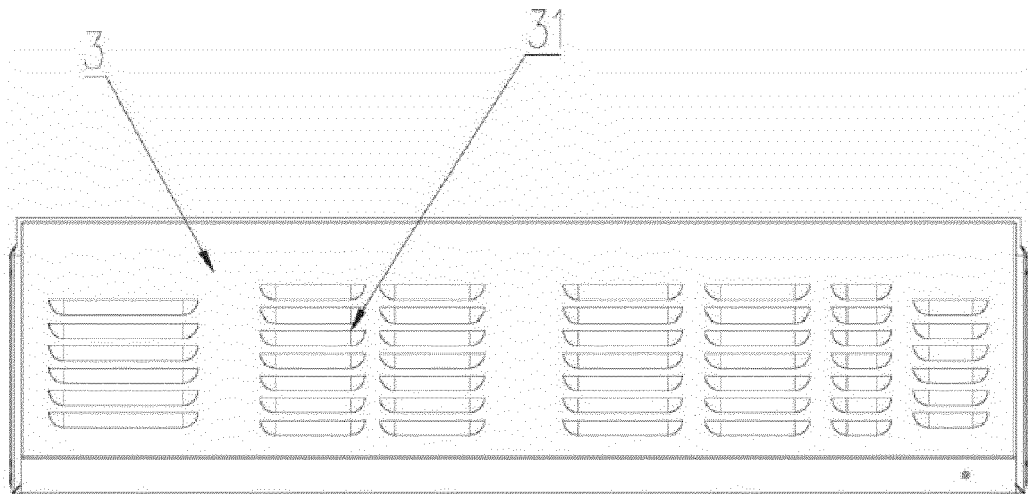


FIG. 3

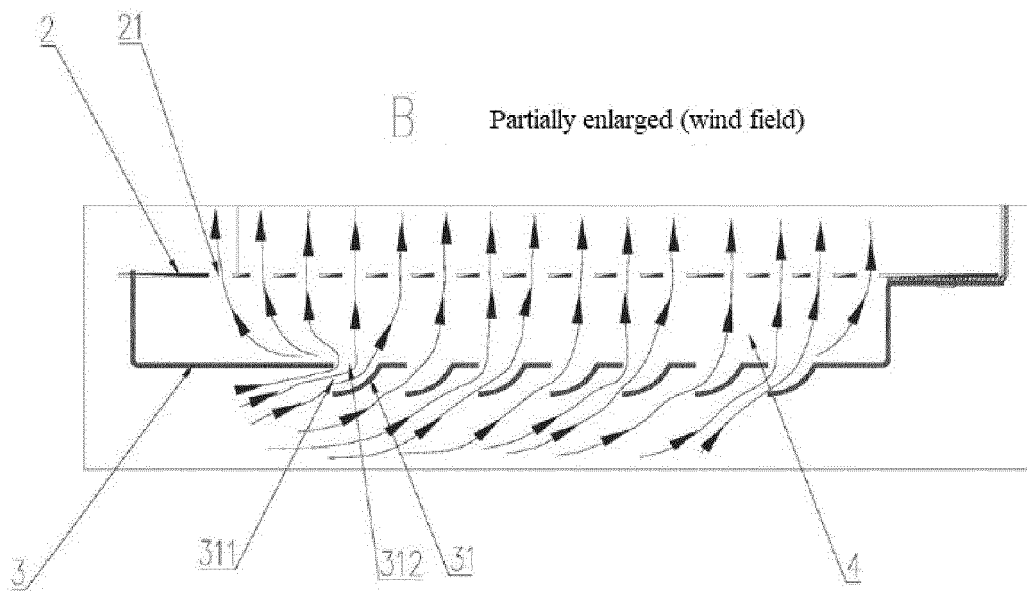


FIG. 4

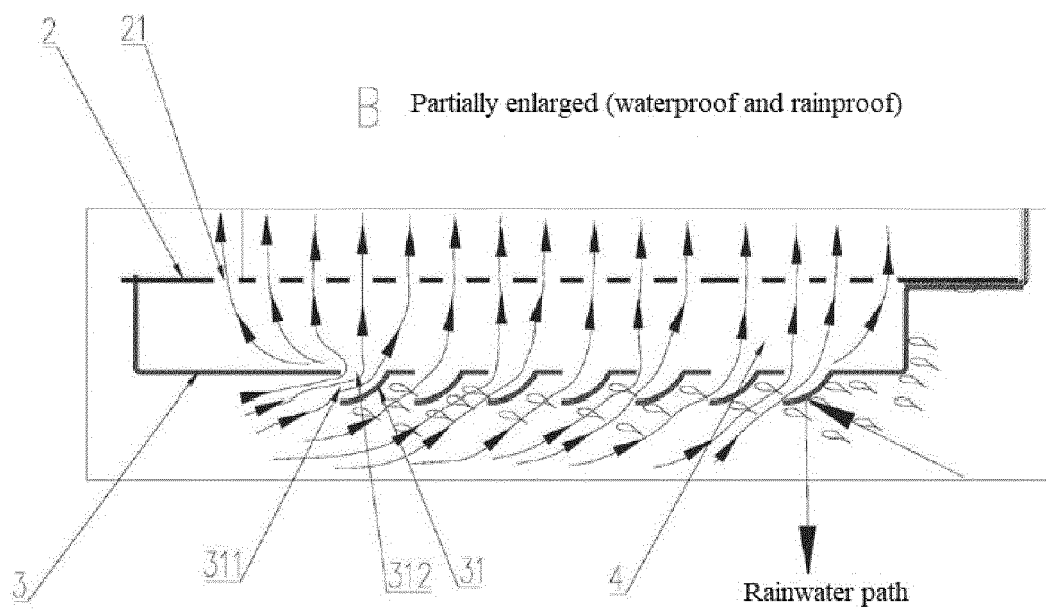


FIG. 5



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Application Number

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Place of search Munich		Date of completion of the search 31 March 2022	Examiner Lienhard, Dominique
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