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(54) **AIR OUTLET MECHANISM AND AIR TREATMENT DEVICE**

(57) The present application relates to an air outlet mechanism and an air treatment device. The air treatment device is provided with a vertical air duct. A first upper end surface of the vertical air duct is obliquely arranged. The air outlet mechanism includes a first air outlet plate and a second air outlet plate. The first air outlet plate surrounds a higher side of the first upper end surface and is rotatably connected to the air treatment device. The second air outlet plate surrounds other parts of the first upper end surface and is connected to the air treatment device. The first air outlet plate includes a straight plate rotatably connected to the air treatment device and an arc-shaped plate connected to the straight plate. An end of the second air outlet plate away from the first upper end surface is inclined toward an outer side of the air duct. An air outlet is formed between the first air outlet plate and the second air outlet plate. The air outlet is capable of being adjusted by rotating the first air outlet plate. The rotation of the first air outlet plate can adjust the shape, size and air flow direction of the air outlet, increasing the flexibility and controllability of the air output, which is easy to control and achieve satisfactory air supply volume and air blow-down effect, and eliminates the dead corners of the air supply. The air outlet

mechanism has high integrity, and can be conveniently produced and easily assembled.

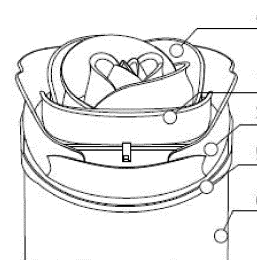


FIG. 1

Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present application claims the priority of the Chinese patent application 201910340629.3 filed on April 25, 2019, titled "AIR OUTLET MECHANISM AND AIR TREATMENT DEVICE", the content of which is hereby incorporated by reference in its entirety.

FIELD

[0002] The present application relates to the field of household appliances, and in particular to an air outlet mechanism and an air treatment device.

BACKGROUND

[0003] With the continuous improvement of quality of life, people have higher requirements for environmental comfort. Therefore, a variety of air treatment devices for improving the environment continuously emerges, and the forms and functions thereof are becoming more abundant. The air treatment device generally needs to input air into the environment to be treated to achieve the purpose of air treatment. In the related art, the air treatment device discharges air flow from a grille, and guides the air flow through transverse air deflectors and longitudinal air blades. This type of air outlet structure is complicated in assemblage and has a monotonic form and dead corners of air supply. In addition, the volume of air supply and the effect of blowing air down are also difficult to control.

[0004] Therefore, it is necessary to provide an air outlet mechanism and an air treatment device.

SUMMARY

[0005] In order to solve the above-described problems, the present application provides an air outlet mechanism and an air treatment device.

[0006] The air outlet mechanism is applied to the air treatment device. The air treatment device is provided with a vertical air duct. A first upper end surface of the vertical air duct is obliquely arranged. The air outlet mechanism includes a first air outlet plate and a second air outlet plate. The first air outlet plate surrounds a higher side of the first upper end surface and is rotatably connected to the air treatment device. The second air outlet plate surrounds other parts of the first upper end surface and is connected to the air treatment device.

[0007] The first air outlet plate includes a straight plate rotatably connected to the air treatment device and an arc-shaped plate connected to the straight plate. An end of the second air outlet plate away from the first upper end surface is inclined toward an outer side of the air duct. An air outlet is formed between the first air outlet plate and the second air outlet plate. The air outlet is

capable of being adjusted by rotating the first air outlet plate.

[0008] In an embodiment, the first upper end surface is surrounded and defined by a straight edge and an arc-shaped edge. The straight edge is perpendicular to an inclination direction of the upper end surface and is at the highest position of the upper end surface. The height of the arc-shaped edge gradually decreases in a direction away from the straight edge.

[0009] The straight plate is rotatably connected to the air treatment device through a rotating shaft parallel to the straight edge. The second air outlet plate is fixedly connected to the arc-shaped edge.

[0010] In an embodiment, an angle between the straight plate and a vertical direction is in a range from 10° to 70°.

[0011] In an embodiment, a tilt angle of the first upper end surface relative to a horizontal plane is in a range from 20° to 50°.

[0012] In an embodiment, a height difference between the highest point and the lowest point of the first upper end surface is in a range from 50 mm to 150 mm.

[0013] In an embodiment, a projection point of a free end of the arc-shaped plate on a horizontal plane is located in a first range. The first range is from a point at an inner side of and distanced from the lowest point of the first upper end surface by 5 mm to another point at an outer side of and distanced from the lowest point of the first upper end surface by 10 mm.

[0014] In an embodiment, a height difference between a free end of the arc-shaped plate and a free end of the second air outlet plate is in a range from 35 mm to 120 mm.

[0015] In an embodiment, a horizontal distance between the highest point of the first upper end surface and the lowest point of the first upper end surface is in a range from 100 mm to 200 mm.

[0016] In an embodiment, a horizontal distance between a free end of the second air outlet plate, which is substantially in the same vertical plane with the lowest point of the first upper end surface, and the lowest point of the first upper end surface is in a range from 0 to 50 mm.

[0017] In an embodiment, a vertical distance between a free end of the second air outlet plate, which is substantially in the same vertical plane with the lowest point of the first upper end surface, and the lowest point of the first upper end surface is in a range from 0 to 100 mm.

[0018] In an embodiment, a height of an air flow guide section of the air duct is in a range from 0 to 150 mm.

[0019] In one embodiment, a second upper end surface of the air treatment device is obliquely arranged. The first upper end surface is arranged at a lower side of the second upper end surface.

[0020] The second air outlet plate is arranged around the edge of the second upper end surface. A decorative component is provided between a surface of the first air outlet plate away from the air duct and the second air outlet plate in the second upper end surface.

[0021] Both ends of the first air outlet plate are provided with decorative ears facing the decorative components, and round chamfers are provided between the decorative ears and the first air outlet plate.

[0022] Based on the same inventive concept, the present application also provides an air treatment device, including the air outlet mechanism as above.

[0023] Compared with the closest prior art, the technical solution of the present application has the following advantages:

[0024] In the air outlet mechanism provided in the technical solution of the present application, the first air outlet plate and the second air outlet plate surround the first upper end surface to form the air outlet, and thus the air outlet extends from the vertical air duct and diverts the air flow direction. The rotation of the first air outlet plate can adjust the shape, size and air flow direction of the air outlet, increasing the flexibility and controllability of the air output, which is easy to control and achieve satisfactory air supply volume and air blow-down effect, meets the individual requirements of different users, and eliminates dead corners of the air supply. The air outlet mechanism has high integrity, and can be produced conveniently and assembled easily. Opposed to the conventional monotonic air outlets, different shapes of air outlets, such as petal shapes, can be realized by designing the shapes of the first air outlet plate and the second air outlet plate, which greatly increases the diversity and aesthetics of the air outlets.

BRIEF DESCRIPTION OF THE DRAWINGS

[0025]

FIG. 1 is a front view of an air outlet mechanism provided in the present application.

FIG. 2 is a side view of the air outlet mechanism provided in the present application.

FIG. 3 is a cross-sectional view of the side view of the air outlet mechanism provided in the present application.

FIG. 4 is a schematic view showing air discharged from the air outlet mechanism provided in the present application.

FIG. 5 is a simplified schematic view of an air outlet of the air outlet mechanism provided in the present application.

FIG. 6 is a schematic view showing sizes of the air outlet of the air outlet mechanism provided in the present application.

FIG. 7 is a schematic view of the air outlet of the air outlet mechanism provided in the present application before and after an angle between a straight plate and a vertical direction changes.

FIG. 8 is a schematic view of the air outlet of the air outlet mechanism provided in the present application before and after a tilt angle of a first upper end surface relative to a horizontal plane changes.

FIG. 9 is a schematic view showing an air blow-down effect of the air outlet mechanism provided by the present application in an air blow-down state.

[0026] 1-first air outlet plate; 2-second air outlet plate; 3-air duct; 4-decorative component; 5-second upper end surface; 6-air treatment device body; 7-rotating shaft; α -angle between a straight plate and a vertical direction; α' -first angle between the straight plate and the vertical direction; α'' -second angle between the straight plate and the vertical direction; β -tilt angle of the first upper end surface relative to a horizontal plane; β'' -second tilt angle of the first upper end surface relative to the horizontal plane; a-height difference between the highest point and the lowest point of the first upper end surface; b-distance between a projection point of a free end of the arc-shaped plate on a horizontal plane and the lowest point of the first upper end surface; b'-first distance between the projection point of the free end of the arc-shaped plate on the horizontal plane and the lowest point of the first upper end surface; b''-second distance between the projection point of the free end of the arc-shaped plate on the horizontal plane and the lowest point of the first upper end surface; c- height difference between the free end of the arc-shaped plate and a free end of the second air outlet plate; c'-first height difference between the free end of the arc-shaped plate and the free end of the second air outlet plate; c''-second height difference between the free end of the arc-shaped plate and the free end of the second air outlet plate; d-horizontal distance between the highest point of the first upper end surface and the lowest point of the first upper end surface; e-horizontal distance between the free end of the second air outlet plate, which is substantially in the same vertical plane with the lowest point of the first upper end surface, and the lowest point of the first upper end surface; f-vertical distance between the free end of the second air outlet plate, which is substantially in the same vertical plane with the lowest point of the first upper end surface, and the lowest point of the first upper end surface; g-height of a air flow guide section.

DETAILED DESCRIPTION

[0027] To make the purpose, technical solutions, and advantages of embodiments of the present application clearer, the technical solutions in the embodiments of the present application will be clearly and completely described below in conjunction with the drawings in the embodiments of the present application. Obviously, the embodiments described below are only a part of, not all of, the embodiments of the invention. Based on the embodiments in the present application, all other embodiments obtained by those of ordinary skill in the art without creative work shall fall within the protection scope of the present application.

[0028] As shown in FIGs. 1 to 5, the present application provides an air outlet mechanism applied to an air treat-

ment device. The air treatment device is provided with a vertical air duct 3. A first upper end surface of the vertical air duct 3 is obliquely arranged. The air outlet mechanism includes a first air outlet plate 1 and a second air outlet plate 2. The first air outlet plate 1 surrounds a higher side of the first upper end surface and is rotatably connected to the air treatment device. The second air outlet plate 2 surrounds other parts of the first upper end surface and is connected to the air treatment device. The first air outlet plate 1 includes a straight plate rotatably connected to the air treatment device and an arc-shaped plate connected to the straight plate. An end of the second air outlet plate 2 away from the first upper end surface is inclined toward an outer side of the air duct 3. An air outlet is formed between the first air outlet plate 1 and the second air outlet plate 2. The air outlet can be adjusted by rotating the first air outlet plate 1.

[0029] The first air outlet plate 1 and the second air outlet plate 2 surround the first upper end surface to form the air outlet, and thus the air outlet extends from the vertical air duct 3 and diverts the air flow direction. The rotation of the first air outlet plate 1 can adjust the shape, size and the air flow direction of the air outlet, increasing the flexibility and controllability of the air output, which is easy to control and achieve satisfactory air supply volume and air blow-down effect, meets the individual requirements of different users, and eliminates dead corners of the air supply. Opposed to the conventional monotonic air outlets, different shapes of air outlets, such as petal shapes, can be realized by designing the shapes of the first air outlet plate 1 and the second air outlet plate 2, which greatly increases the diversity and aesthetics of the air outlets.

[0030] In some embodiments of the present application, the first upper end surface is surrounded and defined by a straight edge and an arc-shaped edge. The straight edge is perpendicular to the inclination direction of the upper end surface and is located at the highest position of the upper end surface. The height of the arc-shaped edge gradually decreases in a direction away from the straight edge. The straight plate is rotatably connected to the air treatment device through a rotating shaft 7 parallel to the straight edge. The second air outlet plate 2 is fixedly connected to the arc-shaped edge.

[0031] The straight edge of the first upper end surface facilitates the mounting of the rotating shaft 7 connected to the first air outlet plate 1 and facilitates the rotation of the first air outlet plate 1. The rotating shaft 7 is parallel to the straight edge, which increases the airtightness of the connection between the air duct 3 and the air outlet to prevent air leakage. The arc-shaped edge cooperates with the straight edge to surround the air duct 3.

[0032] In some embodiments of the present application, an angle α between the straight plate and a vertical direction is in a range from 10° to 70° .

[0033] As shown in FIG. 6 and FIG. 7, when the angle α between the straight plate and the vertical direction is increased to a first angle α' between the first straight plate

and the vertical direction, a distance b between a projection point of the free end of the arc-shaped plate on a horizontal plane and the lowest point of the first upper end surface becomes a first distance b' between the projection point of the free end of the arc-shaped plate on the horizontal plane and the lowest point of the first upper end surface, and a height difference c between the free end of arc-shaped plate and the free end of the second air outlet plate becomes a first height c' difference between the free end of the arc-shaped plate and the free end of the second air outlet plate. Therefore, when the angle α between the straight plate and the vertical direction is increased, the projection point of the free end of the arc-shaped plate on the horizontal plane moves away from the air duct 3, that is, the distance that the arc-shaped plate extends out from the air duct 3 is increased, and the height difference c between the free end of the arc-shaped plate and the free end of the second air outlet plate is decreased, that is, the height of the air outlet becomes smaller. At this time, the first air outlet plate 1 is tilted forward, and an air flow guide length of the air outlet is increased, so that the air flow is forcibly redirected. The air will flow in an oblique downward direction, which achieves the effect of air blowing forward and downward from the air outlet, obtaining a relatively good air blow-down effect. However, if the first air outlet plate 1 is overly tilted forward, the area of the air outlet will be decreased, which increases resistance to the air flow and decreases the volume of the output air. Tests show that when the angle α between the straight plate and the vertical direction is in the range from 10° to 70° , a balance between the air blow-down effect and the air supply volume can be achieved, that is, better air blow-down effect and larger air supply volume can be both obtained at the same time. The two aspects can be both optimized.

[0034] In some embodiments of the present application, a tilt angle β of the first upper end surface relative to the horizontal plane is in a range from 20° to 50° .

[0035] As shown in FIG. 6 and FIG. 8, when the tilt angle β of the first upper end surface relative to the horizontal plane is increased to a second tilt angle β'' between the first upper end surface and the horizontal plane, the angle α between the straight plate and the vertical direction increases to a second angle α'' between the straight plate and the vertical direction, the distance b between the projection point of the free end of the arc-shaped plate on the horizontal plane and the lowest point of the first upper end surface becomes the second distance b'' between the projection point of the free end of the arc-shaped plate on horizontal plane and the lowest point of the first upper end surface, and the height difference c between the free end of arc-shaped plate and the free end of the second air outlet plate becomes the second height difference c'' between the free end of the arc-shaped plate and the free end of the second air outlet plate. Therefore, when the tilt angle β of the first upper end surface relative to the horizontal plane is increased, the angle α between the straight plate and the vertical

direction increases, the projection point of the free end of the arc-shaped plate on the horizontal plane moves away from the air duct 3, that is, the distance that the arc-shaped plate extends out from the air duct 3 is increased, and the height difference c between the free end of the arc-shaped plate and the free end of the second air outlet plate is decreased, that is, the height of the air outlet becomes smaller. At this time, the first air outlet plate 1 is tilted forward, and an air flow guide length of the air outlet is increased, so that the air flow is forcibly redirected. The air will flow in an oblique downward direction, which achieves the effect of air blowing forward and downward from the air outlet, obtaining relatively good air blow-down effect. However, if the first air outlet plate 1 is overly tilted forward, the area of the air outlet will be decreased, which increases resistance to the air flow and decreases the volume of the output air. Tests show that when the tilt angle β of the first upper end surface relative to the horizontal plane is in the range from 20° to 50° , a balance between the air blow-down effect and the air supply volume can be achieved, that is, better air blow-down effect and larger air supply volume can be both obtained at the same time. The two aspects can be both optimized.

[0036] In some embodiments of the present application, a height difference a between the highest point and the lowest point of the first upper end surface is in a range from 50 mm to 150 mm.

[0037] When the height difference a between the highest point and the lowest point of the first upper end surface is in the above-described range, a balance between the air blow-down effect and the air supply volume can be achieved, that is, better air blow-down effect and larger air supply volume can be both obtained at the same time. The two aspects can be both optimized.

[0038] In some embodiments of the present application, the projection of the free end of the arc-shaped plate on the horizontal plane is located in a first range. The first range is from a point at an inner side of and distanced from the lowest point of the first upper end surface by 5 mm to another point at an outer side of and distanced from the lowest point of the first upper end surface by 10 mm.

[0039] The projection point of the free end of the arc-shaped plate on horizontal plane can be located at the inner side of the lowest point of the first upper end surface or located at the outer side of the lowest point of the first upper end surface, that is, the distance that the arc-shaped plate extends out from the air duct 3 can be a positive value or a negative value. When the distance that the arc-shaped plate extends out from the air duct 3 is a positive value, e.g., the first distance b' between the projection point of the free end of the arc-shaped plate on the horizontal plane and the lowest point of the first upper end surface and the second distance b'' between the projection point of the free end of the arc-shaped plate on the horizontal plane and the lowest point of the first upper end surface, the projection point of the free

end of the arc-shaped plate on the horizontal plane is located at the outer side of the lowest point of the first upper end surface. When the distance that the arc-shaped plate extends out from the air duct 3 is a negative value, e.g., the distance b between the projection point of the free end of the arc-shaped plate on the horizontal plane and the lowest point of the first upper end surface, the projection point of the free end of the arc-shaped plate on the horizontal plane is located at the inner side of the lowest point of the first upper end surface. When the projection point of the free end of the arc-shaped plate on the horizontal plane is located in the first range, a balance between the air blow-down effect and the air supply volume can be achieved, that is, better air blow-down effect and larger air supply volume can be both obtained at the same time. The two aspects can be both optimized.

[0040] In some embodiments of the present application, the height difference c between the free end of the arc-shaped plate and the free end of the second air outlet plate is in a range from 35 mm to 120 mm.

[0041] The height difference c between the free end of the arc-shaped plate and the free end of the second air outlet plate is the height of the air outlet. When height difference is within the above-described range, a balance between the air blow-down effect and the air supply volume can be achieved, that is, better air blow-down effect and larger air supply volume can be both obtained at the same time. The two aspects can be both optimized.

[0042] In some embodiments of the present application, a horizontal distance d between the highest point of the first upper end surface and the lowest point of the first upper end surface is in a range from 100 mm to 200 mm.

[0043] The horizontal distance d between the highest point of the first upper end surface and the lowest point of the first upper end surface is the width of the air duct. When it is in the above-described range, a balance between the air blow-down effect and the air supply volume can be achieved, that is, better air blow-down effect and larger air supply volume can be both obtained at the same time.

[0044] In some embodiments of the present application, a horizontal distance e between the free end of the second air outlet plate, which is substantially in the same vertical plane with the lowest point of the first upper end surface, and the lowest point of the first upper end surface is in a range from 0 to 50 mm.

[0045] The horizontal distance e between the free end of the second air outlet plate, which is substantially in the same vertical plane with the lowest point of the first upper end surface, and the lowest point of the first upper end surface is the distance that the second air outlet plate is deviated from the first upper end surface. When it is in the above-described range, a balance between the air blow-down effect and the air supply volume can be achieved, that is, better air blow-down effect and larger air supply volume can be both obtained at the same time.

[0046] In some embodiments of the present application, a vertical distance f between the free end of the second air outlet plate, which is substantially in the same vertical plane with the lowest point of the first upper end surface, and the lowest point of the first upper end surface is in a range from 0 to 100 mm.

[0047] The vertical distance f between the free end of the second air outlet plate, which is substantially in the same vertical plane with the lowest point of the first upper end surface, and the lowest point of the first upper end surface is the height of the second air outlet plate above the first upper end surface. When it is in the above-described range, a balance between air blow-down effect and the air supply volume can be achieved, that is, better air blow-down effect and larger air supply volume can be both obtained at the same time.

[0048] In some embodiments of the present application, a height g of an air flow guide section of the air duct 3 is in a range from 0 to 150 mm. The height g of the air flow guide section of the air duct 3 is the distance from the lowest point of the first upper end surface to the bottom of the air duct 3. When the distance is in the above-described range, a balance between the air blow-down effect and the air supply volume can be achieved, that is, better air blow-down effect and larger air supply volume can be obtained both at the same time.

[0049] In some embodiments of the present application, a second upper end surface 5 of the air treatment device is arranged obliquely. The first upper end surface is arranged at a lower side of the second upper end surface 5. The second upper end surface 5 is an upper end surface of an air treatment device body 6. The second air outlet plate 2 is arranged around the edge of the second upper end surface 5. A decorative component 4 is provided between the surface of the first air outlet plate 1 away from the air duct 3 and the second air outlet plate 2 in the second upper end surface 5. Both ends of the first air outlet plate 1 are provided with decorative ears facing the decorative component 4, and round chamfers are provided between the decorative ears and the first air outlet plate 1.

[0050] The above arrangement increases aesthetics of the second upper end surface 5 of the air treatment equipment. The second air outlet plate 2 surrounds the second upper end surface 5 as a whole, having the decorative component 4 located therein, which, as well as the round chamfer design of the first air outlet plate 1, makes the entire second upper end surface 5 present a artistic flower-like appearance and is also easy to produce and assemble. The air outlet is integrated with the air treatment device, rendering a complete appearance, which can be conveniently produced and assembled with good performance.

[0051] When the above parameters are within the ranges, a balance between the air blow-down effect and the air supply volume can be achieved, that is, better air blow-down effect and larger air supply volume can be obtained at the same time. However, the air blow-down

effect and the air supply volume are not optimized. In order to adapt to the individual needs of different users, the air blow-down effect and the air supply volume were tested in the range of each of the above-described parameters. The position parameters achieving the optimized air blow-down effect and the air supply volume were found.

[0052] When the air volume is the largest, the air resistance would be the smallest, but the air blow-down effect would be poor. The user may need the air to be quickly supplied to adjust and treat the air in the environment to be treated. Direct supplying air to the user is not required or unfavorable. For example, when an air conditioner refrigerates, rapid cooling and large volume of air supply are required, and it is not suitable to supply air directly to the user. To meet this requirement, the parameters can be adjusted to the following ranges or positions:

[0053] The angle α between the straight plate and the vertical direction is in a range from 47° to 50° ;

the tilt angle β of the first upper end surface relative to the horizontal plane is in a range from 36° to 38° ; the height difference a between the highest point and the lowest point of the first upper end surface is in a range from 103 mm to 112 mm;

the projection point of the free end of the arc-shaped plate on the horizontal plane is located at an outer side of and distanced from the lowest point of the first upper end surface by 0 to 3 mm;

the height difference c between the free end of arc-shaped plate and the free end of the second air outlet plate 2 is in a range from 92 mm to 96 mm;

the horizontal distance d between the highest point of the first upper end surface and the lowest point of the first upper end surface is 143 mm;

the horizontal distance e between the free end of the second air outlet plate, which is substantially in the same vertical plane with the lowest point of the first upper end surface, and the lowest point of the first upper end surface is 22 mm;

the vertical distance f between the free end of the second air outlet plate, which is substantially in the same vertical plane with the lowest point of the first upper end surface, and the lowest point of the first upper end surface is 58 mm;

the height g of the air flow guide section of the air duct 3 is 98 mm.

[0054] When the parameters are respectively in the above ranges or at the points, the air supply volume is the largest.

[0055] Opposed to the positions at the maximum air supply volume mentioned above, if the user has no special requirement for the air supply volume but needs the air to be blown down, the air outlet can be adjusted to the air blow-down state. At this time, the first air outlet plate 1 is inclined more forward compared to its position when the air supply volume is the largest, and the air flow

can be effectively directed to the user's activity area, while the air supply volume which is not too small can also meet the needs of the user. For example, when the air conditioner produces heats, it can be adjusted to this state. To meet this requirement, the parameters can be adjusted to the following ranges or positions:

[0056] The angle α between the straight plate and the vertical direction is in a range from 59° to 62° ;

the tilt angle β of the first upper end surface relative to the horizontal plane is in a range from 36° to 38° ; the height difference a between the highest point and the lowest point of the first upper end surface is in a range from 103 mm to 112 mm;

the projection point of the free end of the arc-shaped plate on the horizontal plane is located at an outer side of and distanced from the lowest point of the first upper end surface by 6 to 7 mm;

the height difference c between the free end of arc-shaped plate and the free end of the second air outlet plate is in a range from 46 mm to 49 mm;

the horizontal distance d between the highest point of the first upper end surface and the lowest point of the first upper end surface is 143 mm;

the horizontal distance e between the free end of the second air outlet plate, which is substantially in the same vertical plane with the lowest point of the first upper end surface, and the lowest point of the first upper end surface is 22 mm;

the vertical distance f between the free end of the second air outlet plate, which is substantially in the same vertical plane with the lowest point of the first upper end surface and the lowest point of the first upper end surface is 58 mm;

the height g of the air flow guide section of the air duct 3 is 98 mm.

[0057] When the parameters are respectively in the above ranges or at the points, the air blow-down effect is the best. As shown in FIG. 9, when the air treatment device is mounted at a distance of 1.7 m from the ground, the air can be blown down to a height of 0.5 m at a position in a distance of 3 m from the mounting wall. The length of a regular room can be up to 3 m, and 0.5 m is enough for the air to be blown to the user.

[0058] Based on the same inventive concept, the present application also provides an air treatment device, including the air outlet mechanism. The air treatment device can be an air conditioner or a fresh air ventilator.

[0059] It should be noted that relational terms such as "first" and "second" herein are only used to distinguish one entity or operation from another entity or operation, but do not necessarily require or imply any such actual relationship or order between these entities or operations.

[0060] Finally, it should be noted that the above embodiments are only used to illustrate but not limit the technical solution of the present application. Although the

present application has been described in detail with reference to the foregoing embodiments, those of ordinary skill in the art should understand that they can still modify the technical solutions described in the foregoing embodiments, or substitute some of the technical features with equivalents. However, regarding these modifications or substitutes, the essence of the corresponding technical solutions does not deviate from the spirit and scope of the technical solutions of the embodiments of the present application.

Claims

1. An air outlet mechanism applied to an air treatment device, wherein the air treatment device is provided with a vertical air duct (3), and a first upper end surface of the vertical air duct (3) is obliquely arranged, **characterized in that** the air outlet mechanism comprises:

a first air outlet plate (1) that surrounds a higher side of the first upper end surface and is rotatably connected to the air treatment device, and a second air outlet plate (2) that surrounds other parts of the first upper end surface and is connected to the air treatment device;

the first air outlet plate (1) comprises a straight plate rotatably connected to the air treatment device and an arc-shaped plate connected to the straight plate, an end of the second air outlet plate (2) away from the first upper end surface is inclined toward an outer side of the air duct (3), an air outlet is formed between the first air outlet plate (1) and the second air outlet plate (2), and the air outlet is capable of being adjusted by rotating the first air outlet plate (1).

2. The air outlet mechanism according to claim 1, wherein the first upper end surface is surrounded and defined by a straight edge and an arc-shaped edge, the straight edge is perpendicular to an inclination direction of the upper end surface and is at the highest position of the upper end surface, and the height of the arc-shaped edge gradually decreases in a direction away from the straight edge; the straight plate is rotatably connected to the air treatment device through a rotating shaft (7) parallel to the straight edge, and the second air outlet plate (2) is fixedly connected to the arc-shaped edge.

3. The air outlet mechanism according to claim 2, wherein an angle (α) between the straight plate and a vertical direction is in a range from 10° to 70° .

4. The air outlet mechanism according to claim 2, wherein a tilt angle (β) of the first upper end surface relative to the horizontal plane is in a range from 20°

to 50°.

5. The air outlet mechanism according to claim 2, wherein a height difference (a) between the highest point and the lowest point of the first upper end surface is in a range from 50 mm to 150 mm. 5
6. The air outlet mechanism according to claim 2, wherein a projection point of a free end of the arc-shaped plate on the horizontal plane is located in a first range, and the first range is from a point at an inner side of and distanced from the lowest point of the first upper end surface by 5 mm to another point at an outer side of and distanced from the lowest point of the first upper end surface by 10 mm. 10 15
7. The air outlet mechanism according to claim 2, wherein a height difference (c) between a free end of the arc-shaped plate and a free end of the second air outlet plate is in a range from 35 mm to 120 mm. 20
8. The air outlet mechanism according to claim 2, wherein a horizontal distance (d) between the highest point of the first upper end surface and the lowest point of the first upper end surface is in a range from 100 mm to 200 mm. 25
9. The air outlet mechanism according to claim 2, wherein a horizontal distance (e) between a free end of the second air outlet plate, which is substantially in the same vertical plane with the lowest point of the first upper end surface, and the lowest point of the first upper end surface is in a range from 0 to 50 mm. 30 35
10. The air outlet mechanism according to claim 2, wherein a vertical distance (f) between a free end of the second air outlet plate, which is substantially in the same vertical plane with the lowest point of the first upper end surface, and the lowest point of the first upper end surface is in a range from 0 to 100 mm. 40
11. The air outlet mechanism according to claim 2, wherein a height (g) of a air flow guide section of the air duct (3) is in a range from 0 to 150 mm. 45
12. The air outlet mechanism according to any one of claims 2 to 11, wherein a second upper end surface (5) of the air treatment device is obliquely arranged, and the first upper end surface is arranged at a lower side of the second upper end surface (5); the second air outlet plate (2) is arranged around the edge of the second upper end surface (5), and a decorative component (4) is provided between a surface of the first air outlet plate (1) away from the air duct (3) and the second air outlet plate (2) in the second upper end surface (5); both ends of the first air outlet plate (1) are provided with decorative ears 50 55

facing the decorative components (4), and round chamfers are provided between the decorative ears and the first air outlet plate (1).

13. An air treatment device, comprising the air outlet mechanism according to any one of claims 1 to 12.

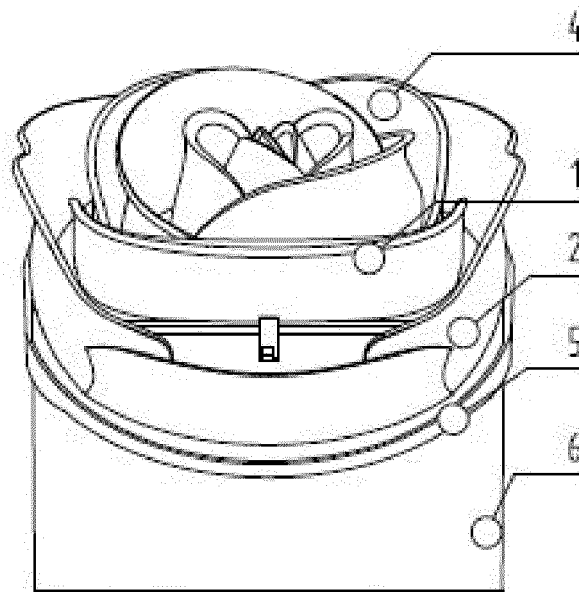


FIG. 1

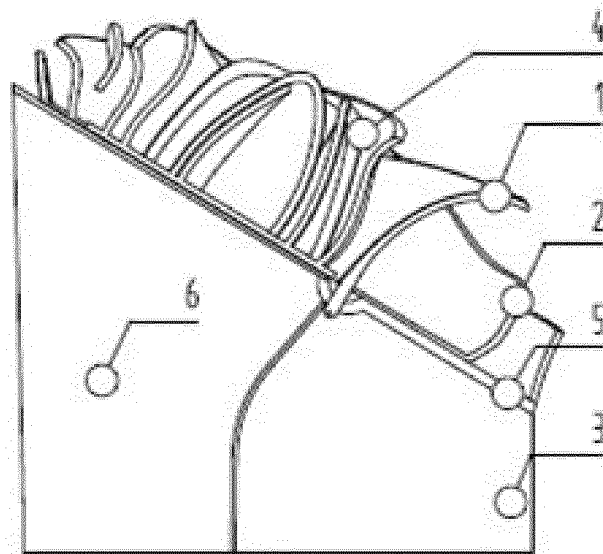


FIG. 3

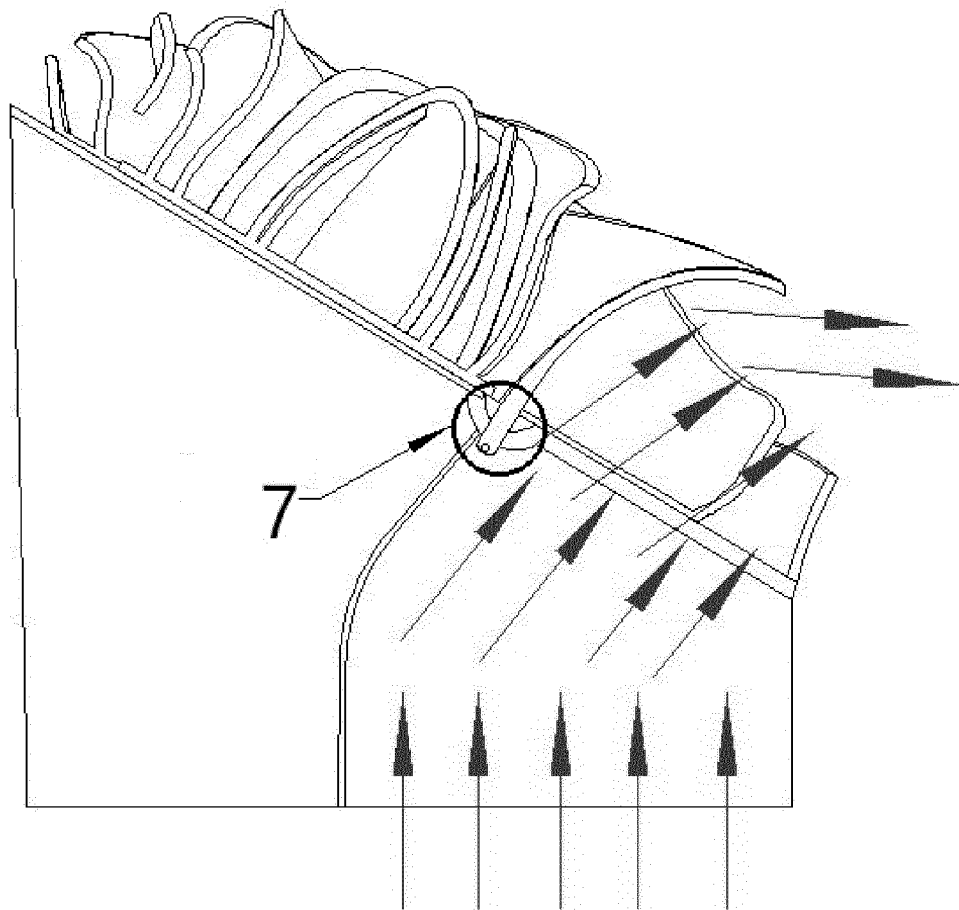


FIG. 4

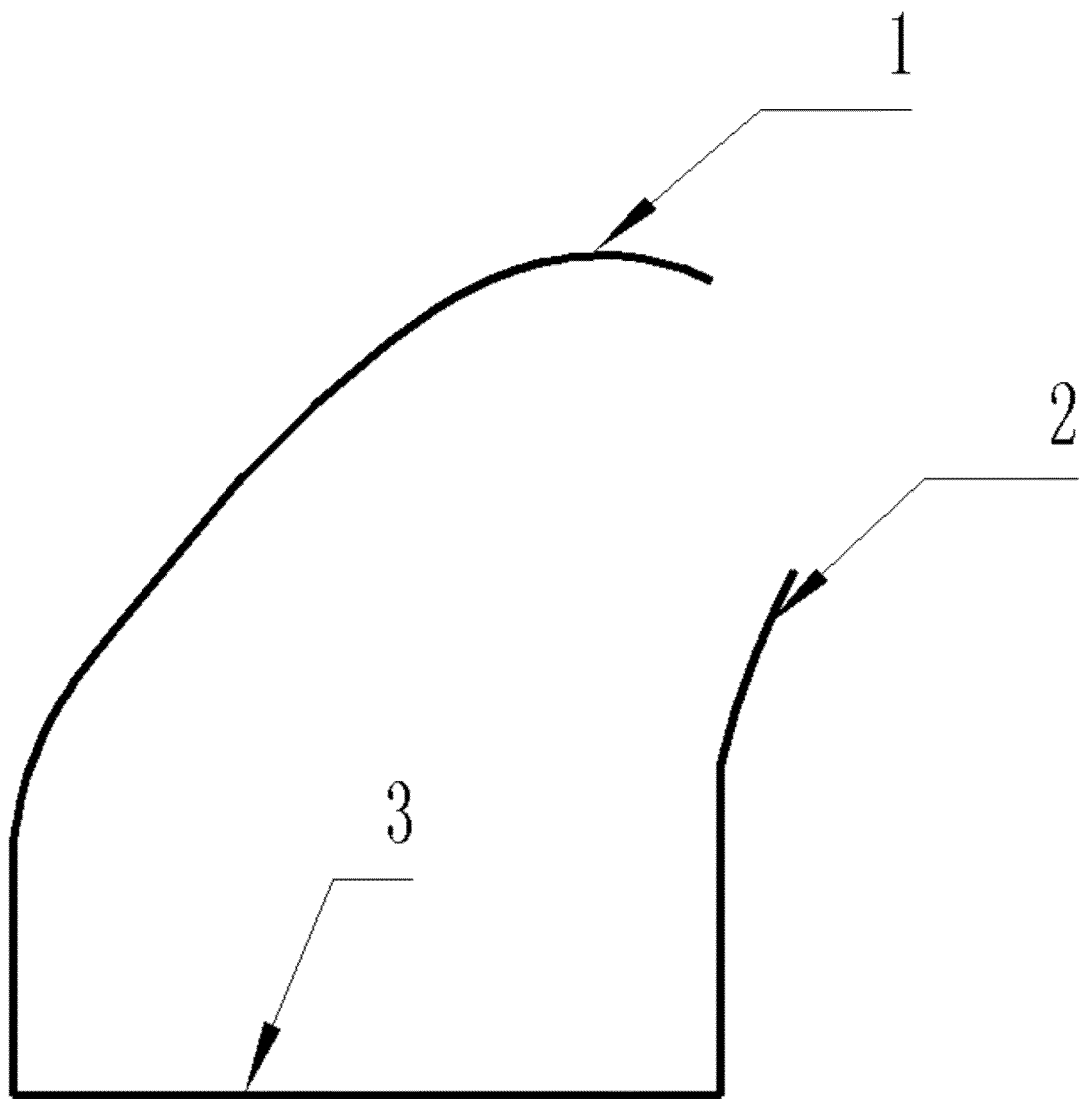


FIG. 5

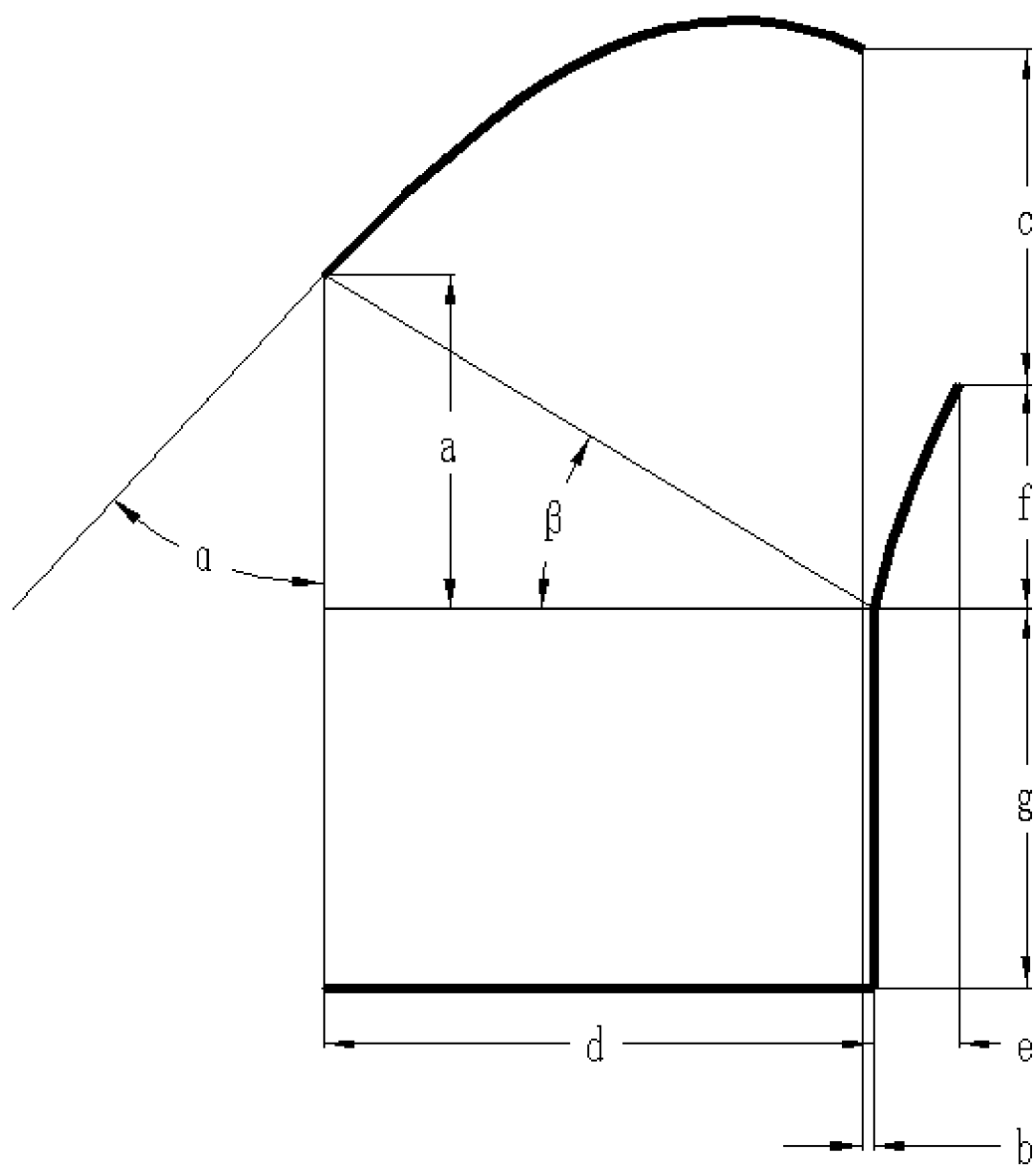


FIG. 6

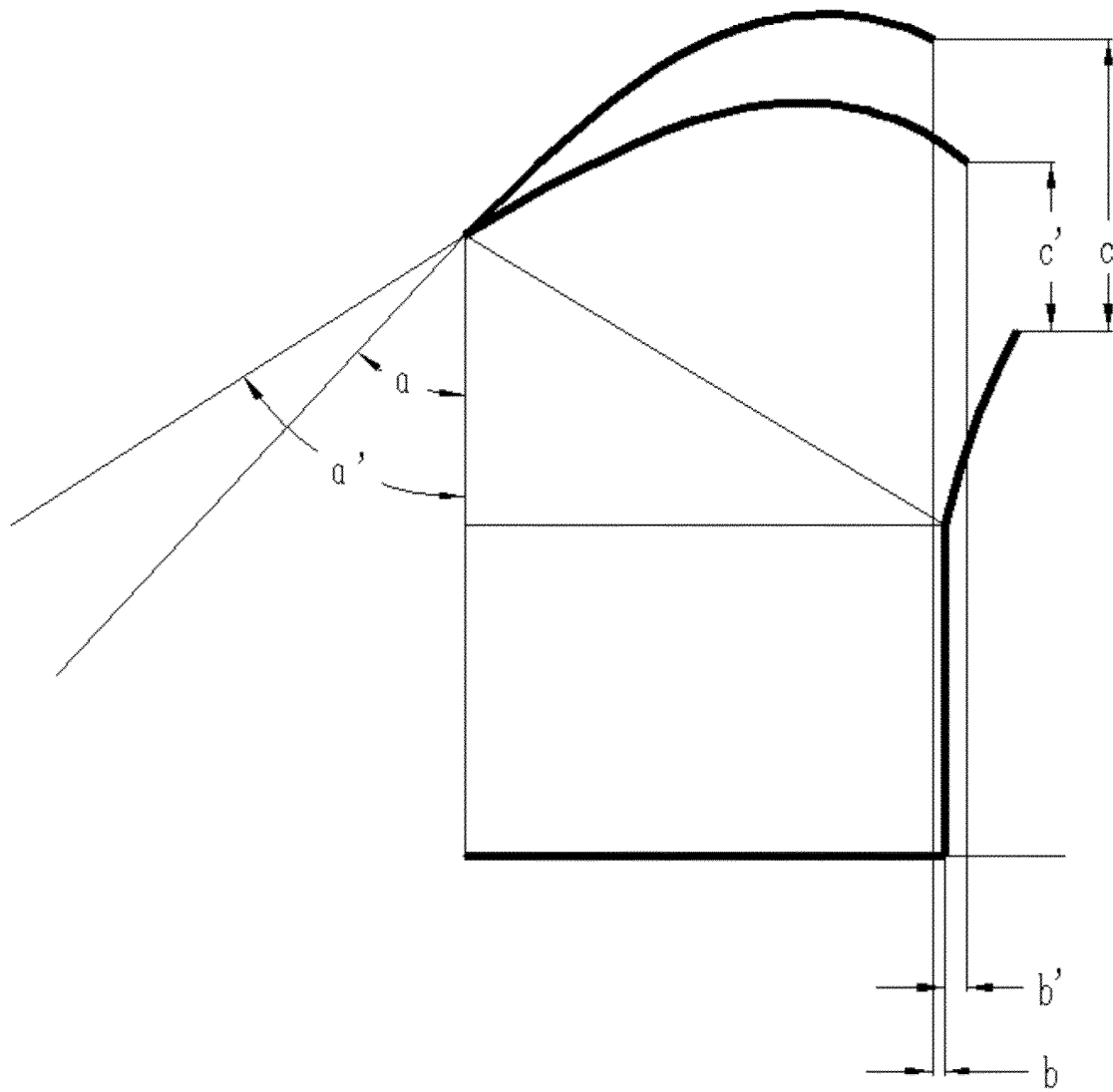


FIG. 7

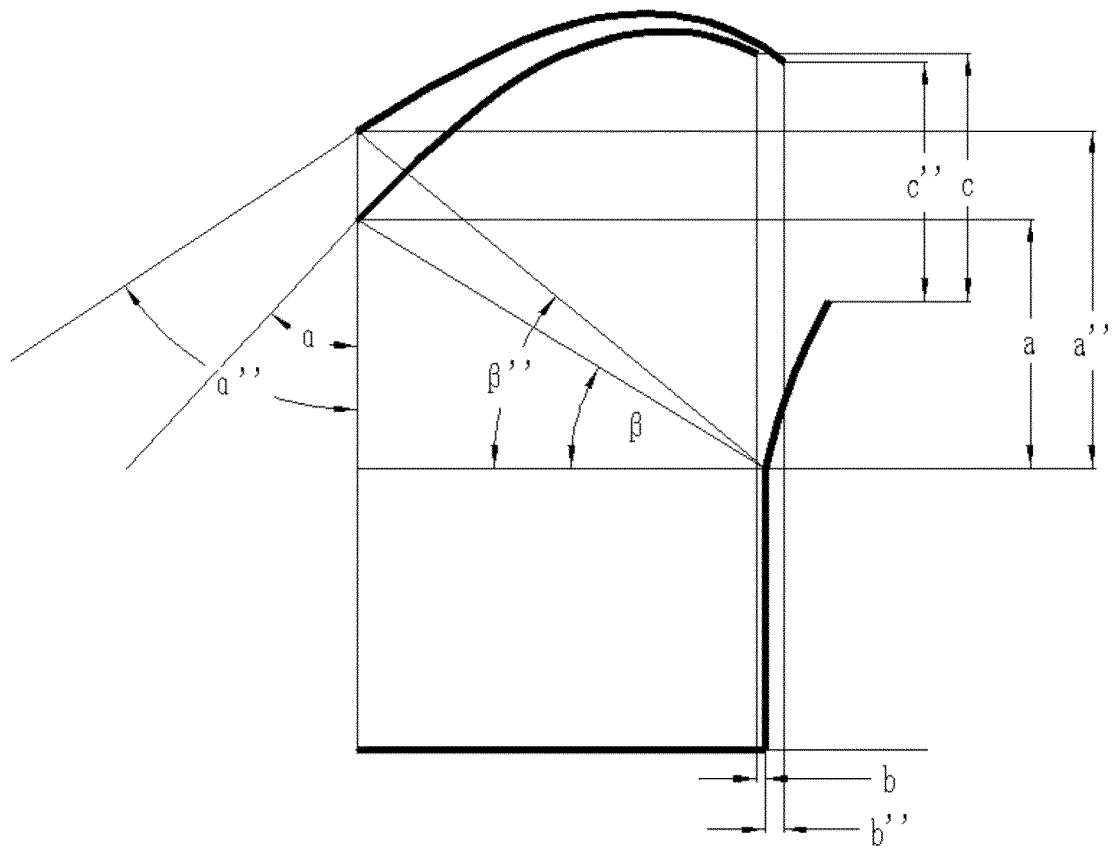


FIG. 8

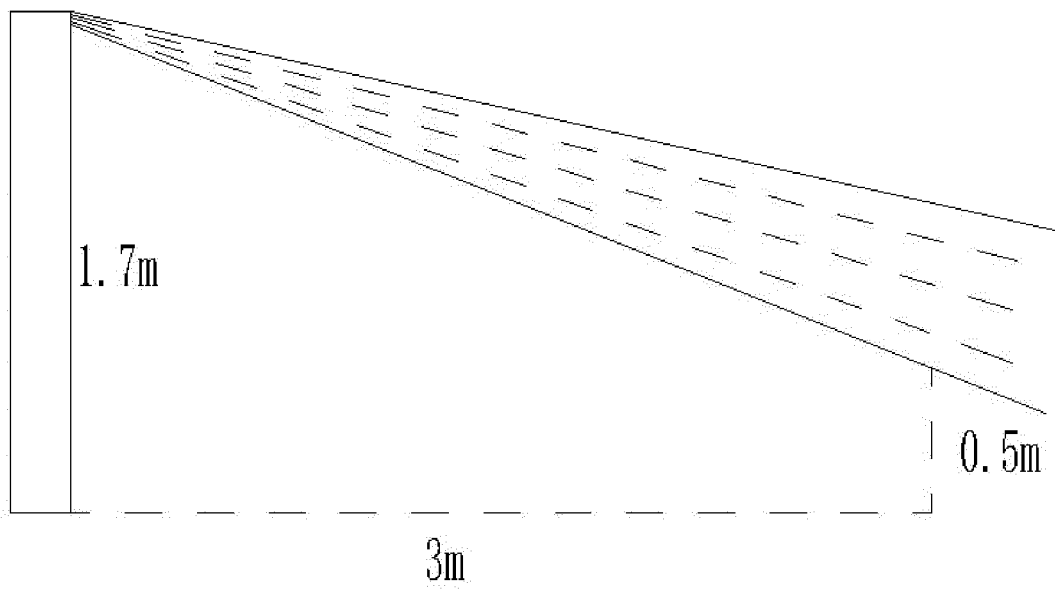


FIG. 9

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/129775

A. CLASSIFICATION OF SUBJECT MATTER

F24F 13/06(2006.01)i; F24F 13/08(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

F24F13

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNABS, CNTXT, DWPI, SIPOABS: 梁玉林, 邹云辉, 黄志辉, 余明养, 程春雨, 王千千, 珠海格力电器+, 板, 出风口, 风道, air outlet, 叶, 弧形, arc, cambered, embowed, 角度, 出风, air conduit

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X	CN 108386988 A (GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI) 10 August 2018 (2018-08-10) description, paragraphs 0026, 0027, 0034, 0038 and 0040, and figures 1-8	1, 13
A	CN 107131564 A (GD MIDEA AIR-CONDITIONING EQUIPMENT CO., LTD.) 05 September 2017 (2017-09-05) entire document	1-13
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☒ Further documents are listed in the continuation of Box C.
 ☒ See patent family annex.

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Date of the actual completion of the international search

18 March 2020

Date of mailing of the international search report

26 March 2020

Name and mailing address of the ISA/CN

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Authorized officer

Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/129775

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