

(19)



(11)

EP 4 826 301 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
21.10.2026 Bulletin 2026/43

(51) International Patent Classification (IPC):
F24F 1/00 ^(2019.01) **F24F 11/79** ^(2018.01)
F24F 13/10 ^(2006.01)

(21) Application number: **25205549.6**

(52) Cooperative Patent Classification (CPC):
F24F 1/0011; F24F 1/0057; F24F 11/79; F24F 13/10

(22) Date of filing: **30.09.2025**

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

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(30) Priority: **15.04.2025 CN 202510473786**

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(54) **AIR CONDITIONER**

(57) Provided is an air conditioner including: a housing having an air outlet; and an air deflector, having, along a lengthwise direction thereof a first and second side opposite to each other, and along a widthwise direction thereof a third and fourth side opposite to each other, with through holes formed along a thickness direction of the air deflector, and the air deflector being movably connected with the housing between a

first and second position, where at the first position, a side air outlet is formed between at least one of the first and second sides and the housing, and the air inside the housing blows out through the through holes and the side air outlet; and at the second position, the air inside the housing blows out through the through holes, at least one of the first and second sides, and at least one of the third and fourth sides.

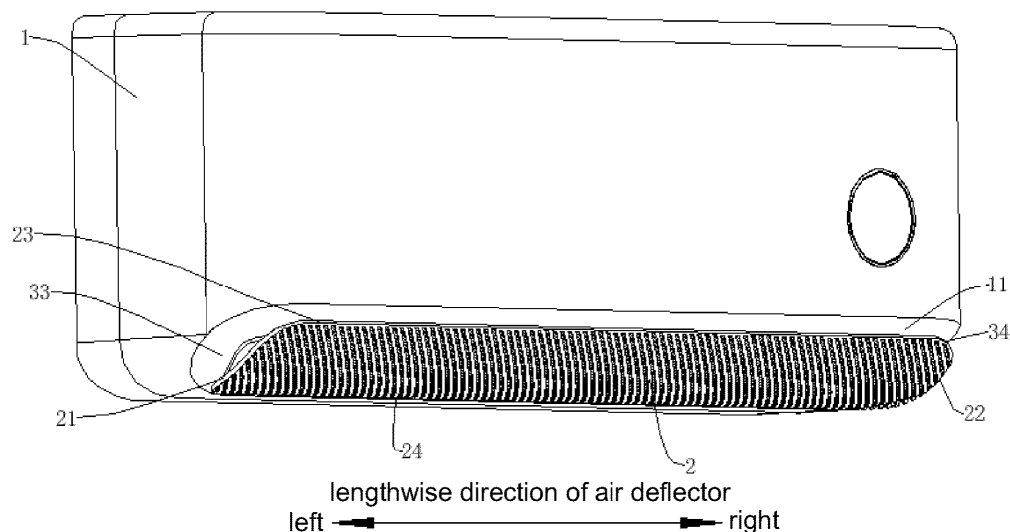


Fig. 1

Description

FIELD

[0001] The present invention relates to the technical field of air-conditioning, and specifically to an air conditioner.

BACKGROUND

[0002] In the related art, an air conditioner includes a housing and an air deflector, where the housing is provided with an air inlet, an air outlet and a side air outlet, the air outlet is opened forwards and arranged with the air deflector to adjust an air outlet direction, and the side air outlet is arranged at a side plate of the housing to enlarge an air outlet range and regulate an air supplying effect.

[0003] However, in order to form a side air outlet passage, the arrangement of the side air outlet of the air conditioner in the related art is prone to occupy partial space inside the housing, thus reducing the volume of a heat exchange air passage in the air conditioner and negatively affecting the air supplying effect at the air outlet.

SUMMARY

[0004] The present invention aims at solving one of the technical problems in the related art at least to some extent. For this, the present invention provides in embodiments an air conditioner which realizes side air outlet of the air conditioner, ensuring the volume of a heat exchange air passage in the air conditioner, thereby improving the air supplying effect.

[0005] According to embodiments of the present invention, the air conditioner includes: a housing provided with an air outlet; and an air deflector, having a first side and a second side opposite to each other along a lengthwise direction of the air deflector, and a third side and a fourth side opposite to each other along a widthwise direction of the air deflector, with a through hole being formed along a thickness direction of the air deflector, and the air deflector being movably connected with the housing between a first position and a second position, where at the first position, a side air outlet is formed between at least one of the first side and the second side and the housing, and the air inside the housing blows out through the through hole and the side air outlet; and at the second position, the air inside the housing blows out through the through hole, at least one of the first side and the second side, and at least one of the third side and the fourth side.

[0006] According to embodiments of the present invention, in the air conditioner, the air deflector is switched between the first position and the second position through the movement of the air deflector relative to the housing. In the case of the air deflector being at

the first position, a side air outlet is formed between at least one of the first side and the second side and the housing, and the airflow inside the housing flows out through the side air outlet and the through hole on the air deflector. Since formed between the housing and the air deflector, the side air outlet does not occupy the volume of the heat exchange air passage inside the air conditioner, which enables side air supplying by the air conditioner while ensuring the volume of the heat exchange air passage inside the air conditioner, thereby improving the air supplying effect and enhancing user experience.

[0007] In some embodiments, at least a part of an outer peripheral contour of the side air outlet is arc-shaped in a plane orthogonal to the lengthwise direction of the air deflector. The arrangement of the arc-shape can guide the airflow better, thus to reduce a flow resistance to the airflow at the side air outlet, thereby improving the airflow flow efficiency.

[0008] In some embodiments, the outer peripheral contour of the side air outlet includes a first contour portion defined by the air deflector and a second contour portion defined by the housing, where at least a part of at least one of the first contour portion and the second contour portion is arc-shaped.

[0009] In embodiments of the present invention, providing at least a part of at least one of the first contour portion and the second contour portion as being arc-shaped, on one hand, makes the airflow flows through the side air outlet more smoothly, thus facilitating airflow guiding by the contour portion(s), and, on the other hand, enhances the aesthetics of the side air outlet and simplifies its structure.

[0010] In some embodiments, one contour portion of the first contour portion and the second contour portion is arc-shaped, and the other is linear-shaped.

[0011] In embodiments of the present invention, one of the first contour portion and the second contour portion is arc-shaped, so as to, with the arc-shaped contour portion, reduce resistance and eddy to the airflow flowing through the arc-shaped contour portion, thus to allow the airflow to pass smoothly and stably; and the other of the first contour portion and the second contour portion is linear-shaped, so as to increase a passing speed of the airflow with the linear-shaped contour portion. The arrangement of the arc-shaped contour portion as well as the linear-shaped contour portion ensures the airflow passing through the side air outlet smoothly while increasing the flow speed of the airflow, thereby improving the efficiency of the air conditioner.

[0012] In some embodiments, said one contour portion is of an arc-shape convex towards or away from said the other contour portion.

[0013] In embodiments of the present invention, one contour portion is of an arc-shape convex towards the other contour portion or one contour portion is of an arc-shape convex away from the other contour portion, which, with the different convex directions of the arc-

shaped contour portions, facilitates re-arrangement and guidance on the airflow passing through the side air outlet, so as to guide the airflow to a position required by a user, thereby improving the air supplying effect and enhancing user experience.

[0014] In some embodiments, the first contour portion and the second contour portion are both arc-shaped, the first contour portion is convex towards or away from the second contour portion, and a convex direction of the first contour portion is opposite to or identical with that of the second contour portion.

[0015] In embodiments of the present invention, both the first contour portion and the second contour portion provided as being arc-shaped can further reduce resistance to the airflow passing through the side air outlet, thus distributing the airflow more even, thereby enhancing the stability of the airflow.

[0016] In some embodiments, the outer peripheral contour of the side air outlet includes a first contour portion defined by the air deflector and a second contour portion defined by the housing, where at least a part of the first contour portion and at least a part of the second contour portion are both linear-shaped.

[0017] In embodiments of the present invention, at least a part of the first contour portion and at least a part of the second contour portion both provided as being linear-shaped enable the air inside the air conditioner to quickly enter the room through the side air outlet with a relatively fast diffusion speed, thus increasing an air circulation speed, thereby enhancing the performance of the air conditioner.

[0018] In some embodiments, the side air outlet includes a first side air outlet formed by the first side of the air deflector and the housing, and a second side air outlet formed by the second side of the air deflector and the housing.

[0019] In embodiments of the present invention, the arrangement of the first side air outlet and the second side air outlet enables a part of the airflow inside the air conditioner to be blown out via the first side air outlet and the other part of the airflow to be blown out via the second side air outlet, realizing simultaneous air blowing at both sides of the air conditioner in the lengthwise direction of the housing.

[0020] In some embodiments, the air conditioner further includes a flow guide member provided at the side air outlet and arranged on at least one of the housing and the air deflector.

[0021] In embodiments of the present invention, the flow guide member is provided in the side air outlet so as to direct the airflow from the side air outlet to a set area, such that the flow guide member can re-arrange and guide the airflow from the side air outlet, thus to guide the airflow to a position required by a user, thereby improving the air supplying effect and enhancing user experience.

[0022] In some embodiments, the flow guide member includes a flow guide plate provided at the side air out-

let, dividing the side air outlet into at least two flow guide areas. Accordingly, the air blown out by the side air outlet can enter different flow guide areas individually, and then be led out of the air conditioner under the guidance of the guide areas, so as to improve the diffusion of the air blown out by the side air outlet, thereby enlarging the air supplying area.

[0023] In some embodiments, the flow guide member includes a ventilation plate covering the side air outlet and provided with a plurality of ventilation holes punching through the ventilation plate along a thickness direction thereof. Accordingly, on the one hand, the airflow blown from the side air outlet can be scattered by the ventilation plate, rendering the air blown out from the side air outlet softer, thereby improving user experience. On the other hand, since the ventilation plate covers the side air outlet, dust or foreign matter from the outside can be prevented from entering the air conditioner, that is, the ventilation plate has a certain dust-proof effect, thereby enhancing the reliability of the air conditioner.

[0024] In some embodiments, the flow guide member includes a flow guide fan provided at the side air outlet. Accordingly, the flow guide fan can guide the airflow blown out from the side air outlet to diffuse the airflow into all directions, thus to improve the diffusion of the airflow at the side air outlet, thereby enlarging the air supplying area.

[0025] In some embodiments, there are a plurality of the through holes arranged at intervals, at least a part of the air deflector is configured as a grid portion formed by ribs, and at least a part of the through holes are formed by grid holes in the grid portion.

[0026] According to embodiments of the present invention, as the air deflector is provided with a plurality of through holes, the air conditioner can still operate and supply air via the through holes and the side air outlet formed between the air deflector and the housing, when the air deflector is reset (i.e., positioned at the first position), thus improving flexibility on air blowing of the air conditioner and rendering air supplying softer, which is beneficial to enhance user experience. Additionally, at least a part of the air deflector is configured as a grid portion formed by ribs, and at least a part of the through holes are formed by grid holes in the grid portion, which therefore allows increased arrangement density of the through holes on the basis of ensuring the air deflector with sufficient structural strength, thereby improving the air supplying effect.

[0027] In some embodiments, the ribs include a first rib and a second rib intersected with each other in a same plane or intersected with each other and stacked along the thickness direction of the air deflector. The arrangement of the air deflector with the grid portion adopting the above design can enhance the structural strength of the air deflector, thereby reducing the probability of damage caused by collision to the air deflector.

[0028] In some embodiments, at least a part of the ribs are linear ribs or curved ribs, which thereby improves the modeling integrity of the air deflector, and facilitates processing and manufacturing thereof.

[0029] In some embodiments, the through hole includes a first through hole and a second through hole, and the air deflector includes the grid portion and a non-grid portion, where the first through hole is formed by the grid hole of the grid portion, and the second through hole is formed in the non-grid portion. Therefore, the air deflector is provided with the grid holes and non-grid holes, which increases the diversity of air supplying by the air deflector, and has an attractive appearance with good integrity.

[0030] In some embodiments, at the first position, the side air outlet has an air outlet sectional area A, and the housing has a projected area B of the outer peripheral contour in a projective plane orthogonal to the lengthwise direction of the air deflector, where $0 < A/B \leq 8\%$.

[0031] According to embodiments of the present invention, a relationship between the air outlet sectional area of the side air outlet and the projected area of the outer peripheral contour of the housing is defined in the case of the air deflector being at the first position, which not only ensures normal side air supplying of the air conditioner at the first position, but also avoids the problem that a user could directly observe parts inside the housing via the side of the air conditioner due to an excessively large air outlet sectional area of the side air outlet, thus to improve the integrity of the appearance of the air conditioner, thereby providing better user experience.

BRIEF DESCRIPTION OF THE DRAWINGS

[0032]

Fig. 1 is a schematic diagram showing an air conditioner according to an embodiment of the present invention.

Fig. 2 is a schematic diagram showing an air conditioner according to a first embodiment of the present invention.

Fig. 3 is a schematic diagram showing an air conditioner according to a second embodiment of the present invention.

Fig. 4 is a schematic diagram showing an air conditioner according to a third embodiment of the present invention.

Fig. 5 is a schematic diagram showing an air conditioner according to a fourth embodiment of the present invention.

Fig. 6 is a schematic diagram showing an air conditioner according to a fifth embodiment of the present invention.

Fig. 7 is a schematic diagram showing an air conditioner according to a sixth embodiment of the present invention.

Fig. 8 is a schematic diagram showing an air conditioner according to a seventh embodiment of the present invention.

Fig. 9 is a schematic diagram showing an air conditioner according to an eighth embodiment of the present invention.

Fig. 10 is a schematic diagram showing an air conditioner according to a ninth embodiment of the present invention.

Fig. 11 is a schematic diagram showing a flow guide member according to an embodiment of the present invention.

Fig. 12 is a schematic diagram showing a flow guide member according to another embodiment of the present invention.

Fig. 13 is a schematic diagram showing a flow guide member according to yet another embodiment of the present invention.

Fig. 14 is a schematic diagram showing a ventilation plate according to an embodiment of the present invention.

Fig. 15 is a schematic diagram showing a flow guide fan according to an embodiment of the present invention.

Fig. 16 is a schematic diagram showing an air deflector according to an embodiment of the present invention.

Fig. 17 is a schematic diagram showing an air deflector according to another embodiment of the present invention.

Fig. 18 is a schematic diagram showing an air deflector according to yet another embodiment of the present invention.

Fig. 19 is a schematic diagram showing an air deflector according to still another embodiment of the present invention.

[0033] Drawing references:

housing 1; air outlet 11;
air deflector 2; first side 21; second side 22; third side 23; fourth side 24; through hole 25; first through hole 251; second through hole 252; grid portion 26; first rib 261; second rib 262; non-grid portion 27;
side air outlet 3; first contour portion 31; second contour portion 32; first side air outlet 33; second side air outlet 34; flow guide area 35;
flow guide member 4; flow guide plate 41; ventilation plate 42; ventilation holes 421; flow guide fan 43.

DETAILED DESCRIPTION

[0034] Reference will now be made in detail to embodiments, examples of which are illustrated in the accompanying drawings. The embodiments described herein with reference to drawings are explanatory, illus-

trative, and used to generally understand the present invention. The embodiments shall not be construed to limit the present invention.

[0035] Description will be made to an air conditioner according to embodiments of the present invention below with reference to Figs. 1 to 19.

[0036] According to embodiments of the present invention, the air conditioner includes: a housing 1 provided with an air outlet 11; and an air deflector 2, having, along a lengthwise direction of the air deflector 2, a first side 21 and a second side 22 opposite to each other, and a third side 23 and a fourth side 24 opposite to each other along a widthwise direction of the air deflector 2. The air deflector 2 has a through hole 25 being formed along a thickness direction of the air deflector 2, and is movably connected with the housing 1 between a first position and a second position, where at the first position, a side air outlet 3 is formed between at least one of the first side 21 and the second side 22 and the housing 1, and the air inside the housing 1 blows out through the through hole 25 and the side air outlet 3; and at the second position, the air inside the housing 1 blows out through the through hole 25, at least one of the first side 21 and the second side 22, and at least one of the third side 23 and the fourth side 24.

[0037] According to embodiments of the present invention, in the air conditioner, the air deflector 2 is switched between the first position and the second position through the movement of the air deflector 2 relative to the housing 1. In the case of the air deflector 2 being at the first position, a side air outlet 3 is formed between at least one of the first side 21 and the second side 22 and the housing 1, and the airflow inside the housing 1 flows out through the side air outlet 3 and the through hole 25 on the air deflector 2. Since formed between the housing 1 and the air deflector 2, the side air outlet 3 does not occupy the volume of the heat exchange air passage inside the air conditioner, which enables side air supplying by the air conditioner while ensuring the volume of the heat exchange air passage inside the air conditioner, thereby improving the air supplying effect and enhancing user experience.

[0038] Specifically, as shown in Fig. 1, the lengthwise direction of the air deflector 2 is consistent with a left-right direction, the air deflector 2 is provided at the air outlet 11, and an rear end of the air deflector 2 is movably connected with the housing 1 such that the air deflector 2 is switchable between the first position and the second position. "At least one of the first side 21 and the second side 22 of the air deflector 2" may be understood as forming the side air outlet 3 between the left side of the air deflector 2 and the housing 1; or forming the side air outlet 3 between the right side of the air deflector 2 and the housing 1; or forming a side air outlet 3 between the left side of the air deflector 2 and the housing 1, and forming a side air outlet 3 between the right side of the air deflector 2 and the hous-

ing 1, i.e., there are two side air outlets 3 as formed.

[0039] In the case of the air deflector 2 being at the first position, the air deflector 2 moves, relative to the housing 1, in a direction close to the air outlet 11 to form a baffle at the air outlet 11, that is, the third side 23 and the fourth side 24 of the air deflector 2 abut against the housing 1, forming the side air outlet 3 between: the first side 21 and/or the second side 22 of the air deflector 2; and the housing 1. In other words, the air deflector 2 closes the front side of the air outlet 11. At this time, the air inside the housing 1 can be blown out through the side air outlet 3 and the through hole 25, preventing the airflow from blowing directly to the human body, thus to provide stronger comfort feeling, thereby enhancing user experience.

[0040] In the case of the air deflector 2 being at the second position, the air deflector 2 moves, relative to the housing 1, in a direction away from the air outlet 11 to open the front side of the air outlet 11, where the air deflector 2 is spaced apart from the air outlet 11, such that the airflow is allowed to blow out via the air outlet 11 and, with the guidance of the air deflector 2, to blow out through at least one side in the widthwise direction of the air deflector 2, at least one side in the lengthwise direction of the air deflector 2 and the through hole 25, which provides a relatively large air outlet area, thereby realizing rapid cooling and heating with the air conditioner.

[0041] That is, under a condition of the air deflector 2 being at the first position, the air deflector 2 may close the air outlet 11, at which the air outlet 11 may not emit air or emit air with a small quantity of flow. Under a condition of the air deflector 2 being at the second position, the air deflector 2 may open the air outlet 11, at which the air outlet 11 emits air with a large quantity of flow. Additionally, the side air outlet 3 could be formed between the housing 1 and the air deflector 2 and the air inside the housing 1 could be blown out through the side air outlet 3 only when the air deflector 2 is at the first position, since the side air outlet 3 is formed between the housing 1 and the air deflector 2. The air deflector 2 may be switchable between the first position and the second position, allowing a user to adjust the air deflector 2 according to needs to let the airflow blow out through either the air outlet 11 or the side air outlet 3, thereby realizing front air supplying or side air supplying by the air conditioner.

[0042] In some embodiments, as shown in Figs. 2 to 9, at least a part of an outer peripheral contour of the side air outlet 3 is arc-shaped in a plane orthogonal to the lengthwise direction of the air deflector 2. The arrangement of the arc-shape can guide the airflow better, thus to reduce a flow resistance to the airflow at the side air outlet 3, thereby improving the airflow flow efficiency.

[0043] In some embodiments, the outer peripheral contour of the side air outlet 3 includes a first contour portion 31 defined by the air deflector 2 and a second

contour portion 32 defined by the housing 1, where at least a part of at least one of the first contour portion 31 and the second contour portion 32 is arc-shaped.

[0044] Specifically, as shown in Figs. 2 to 9, "at least a part of at least one of the first contour portion 31 and the second contour portion 32 being arc-shaped" may be understood as at least a part of the first contour portion 31 being arc-shaped; or at least a part of the second contour portion 32 being arc-shaped; or at least a part of the first contour portion 31 and at least a part of the second contour portion 32 both being arc-shaped. The arrangement of the arc-shaped contour portion(s) on one hand, makes the airflow flows through the side air outlet 3 more smoothly, thus facilitating airflow guiding by the contour portion(s), and, on the other hand, enhances the aesthetics of the side air outlet 3 and simplifies its structure.

[0045] Optionally, "at least a part of the first contour portion 31 being arc-shaped" may be a part of the first contour portion 31 being arc-shaped, or the first contour portion 31 entirely being arc-shaped. "At least a part of the second contour portion 32 being arc-shaped" may be a part of the second contour portion 32 being arc-shaped, or the second contour portion 32 entirely being arc-shaped. "At least a part of the first contour portion 31 and at least a part of the second contour portion 32 both being arc-shaped" may be a part of the first contour portion 31 being arc-shaped, and a part of the second contour portion 32 being arc-shaped; or a part of the first contour portion 31 being arc-shaped, and the second contour portion 32 entirely being arc-shaped; or the first contour portion 31 entirely being arc-shaped, and a part of the second contour portion 32 being arc-shaped; or the first contour portion 31 entirely being arc-shaped, and the second contour portion 32 entirely being arc-shaped.

[0046] In some embodiments, one of the first contour portion 31 and the second contour portion 32 is arc-shaped, and the other is linear-shaped.

[0047] Specifically, as shown in Figs. 2 to 5, the first contour portion 31 is linear-shaped, and the second contour portion 32 is arc-shaped; or the first contour portion 31 is arc-shaped, and the second contour portion 32 is linear-shaped.

[0048] Fig. 2 shows an air conditioner according to a first example, where the first contour portion 31 defined by the air deflector 2 is arc-shaped being convex away from the second contour portion 32, and the second contour portion 32 defined by the housing 1 is linear-shaped.

[0049] Fig. 3 shows an air conditioner according to a second example, where the first contour portion 31 defined by the air deflector 2 is linear-shaped, and the second contour portion 32 defined by the housing 1 is arc-shaped being convex towards the first contour portion 31.

[0050] Fig. 4 shows an air conditioner according to a third example, where the first contour portion 31 de-

fined by the air deflector 2 is linear-shaped, and the second contour portion 32 defined by the housing 1 is arc-shaped being convex away from the first contour portion 31.

5 [0051] Fig. 5 shows an air conditioner according to a fourth example, where the first contour portion 31 defined by the air deflector 2 is arc-shaped being convex towards the second contour portion 32, and the second contour portion 32 defined by the housing 1 is linear-shaped.

10 [0052] In embodiments of the present invention, one of the first contour portion 31 and the second contour portion 32 is arc-shaped, so as to, with the arc-shaped contour portion, reduce resistance and eddy to the airflow flowing through the arc-shaped contour portion, thus to allow the airflow to pass smoothly and stably; and the other of the first contour portion and the second contour portion is linear-shaped, so as to increase a passing speed of the airflow with the linear-shaped contour portion. The arrangement of the arc-shaped contour portion as well as the linear-shaped contour portion ensures the airflow passing through the side air outlet 3 smoothly while increasing the flow speed of the airflow, thereby improving the efficiency of the air conditioner.

[0053] In some embodiments, one contour portion is of an arc-shape convex towards or away from the other contour portion.

30 [0054] In embodiments of the present invention, one contour portion is of an arc-shape convex towards the other contour portion or one contour portion is of an arc-shape convex away from the other contour portion, which, with the different convex directions of the arc-shaped contour portions, facilitates re-arrangement and guidance on the airflow passing through the side air outlet 3, so as to guide the airflow to a position required by a user, thereby improving the air supplying effect and enhancing user experience.

35 [0055] Specifically, as shown in Figs. 2 and 4, the first contour portion 31 is formed in a linear-shape and the second contour portion 32 is formed in an arc-shape being convex away from the first contour portion 31; or the first contour portion 31 is formed in an arc-shape being convex away from the second contour portion 32, and the second contour portion 32 is formed in linear-shape, which facilitates the connection between the air deflector 2 and the housing 1 and simplifies the structure.

40 [0056] As shown in Figs. 3 and 5, the arrangement of the first contour portion 31 formed in a linear-shape and the second contour portion 32 formed in an arc-shape being convex towards the first contour portion 31, or the arrangement of the first contour portion 31 formed in an arc-shape being convex towards the second contour portion 32 and the second contour portion 32 formed in linear-shape, increases the diversity of air supplying from the side air outlet 3 and improves its aesthetics meanwhile.

[0057] In some embodiments, as shown in Figs. 6 to 9, the first contour portion 31 and the second contour portion 32 are both arc-shaped, the first contour portion 31 is convex towards or away from the second contour portion 32, and a convex direction of the first contour portion 31 is opposite to or identical with that of the second contour portion 32. Both the first contour portion 31 and the second contour portion 32 provided as being arc-shaped can further reduce resistance to the airflow passing through the side air outlet 3, thus distributing the airflow more even, thereby enhancing the stability of the airflow.

[0058] Fig. 6 shows an air conditioner according to a fifth example, where the first contour portion 31 is formed in an arc-shape being convex away from the second contour portion 32, and the second contour portion 32 is formed in an arc-shape being convex towards the first contour portion 31, with identically convex directions between the first contour portion 31 and the second contour portion 32.

[0059] Fig. 7 shows an air conditioner according to a sixth example, where the first contour portion 31 is formed in an arc-shape being convex away from the second contour portion 32, and the second contour portion 32 is formed in an arc-shape being convex away from the first contour portion 31, with oppositely convex directions between the first contour portion 31 and the second contour portion 32. The first contour portion 31 and the second contour portion 32 convex respectively in directions away from each other, on one hand, ensure an air outlet area of the side air outlet 3 thus to ensure the quantity of flow from the air conditioner, and, on the other hand, enable the airflow to smoothly flow along the curves of the two arc-shaped contour portions, thus to effectively disperse wind power to reduce wind pressure of the airflow, thereby improving the air supplying effect.

[0060] Fig. 8 shows an air conditioner according to a seventh example, where the first contour portion 31 is formed in an arc-shape being convex towards the second contour portion 32, and the second contour portion 32 is formed in an arc-shape being convex towards the first contour portion 31, with oppositely convex directions between the first contour portion 31 and the second contour portion 32.

[0061] Fig. 9 shows an air conditioner according to an eighth example, where the first contour portion 31 is formed in an arc-shape being convex towards the second contour portion 32, and the second contour portion 32 is formed in an arc-shape being convex away from the first contour portion 31, with identically convex directions between the first contour portion 31 and the second contour portion 32.

[0062] In some embodiments, the outer peripheral contour of the side air outlet 3 includes a first contour portion 31 defined by the air deflector 2 and a second contour portion 32 defined by the housing 1, where at least a part of the first contour portion 31 and at least a

part of the second contour portion 32 are both linear-shaped.

[0063] Specifically, as shown in Fig. 10, "at least a part of the first contour portion 31 and at least a part of the second contour portion 32 both being linear-shaped" may be understood as a part of the first contour portion 31 being linear-shaped and a part of the second contour portion 32 being linear-shaped; or the first contour portion 31 entirely being linear-shaped, and the second contour portion 32 entirely being linear-shaped; or the a part of the first contour portion 31 being linear-shaped and the second contour portion 32 entirely being linear-shaped; or the first contour portion 31 entirely being linear-shaped, and a part of the second contour portion 32 being linear-shaped.

[0064] Fig. 10 shows an air conditioner according to a ninth example, where the first contour portion 31 and the second contour portion 32 are both linear-shaped, enabling the air inside the housing 1 to quickly enter the room through the side air outlet 3 with a relatively fast diffusion speed, thus increasing an air circulation speed, thereby enhancing the performance of the air conditioner.

[0065] In some embodiments, the side air outlet 3 includes a first side air outlet 33 formed by the first side 21 of the air deflector 2 and the housing 1, and a second side air outlet 34 formed by the second side 22 of the air deflector 2 and the housing 1.

[0066] Specifically, as shown in Fig. 1, the first side 21 of the air deflector 2 corresponds to the left side of the air deflector 2, and the second side 22 of the air deflector 2 corresponds to the right side of the air deflector 2, forming the first side air outlet 33 by the left side of the air deflector 2 and the left side of the housing 1, and forming the second side air outlet 34 by the right side of the air deflector 2 and the right side of the housing 1. The arrangement of the first side air outlet 33 and the second side air outlet 34 enables a part of the airflow inside the housing 1 to be blown out and flow to the left via the first side air outlet 33 and the other part of the airflow to be blown out flow to the right via the second side air outlet 34, thereby realizing left and right air supplying by the air conditioner.

[0067] In some embodiments, the air conditioner further includes a flow guide member 4 provided at the side air outlet 3 and arranged on at least one of the housing 1 and the air deflector 2.

[0068] Specifically, as shown in Figs. 11 to 15, the flow guide member 4 is provided in the side air outlet 3 so as to direct the airflow from the side air outlet 3 to a set area, such that the flow guide member 4 can rearrange and guide the airflow from the side air outlet 3, thus to guide the airflow to a position required by a user, thereby improving the air supplying effect and enhancing user experience.

[0069] It would be understood that the flow guide member 4 can rearrange and guide the airflow from the side air outlet 3, which, on one hand, can reduce

turbulence occurring at the side air outlet 3 as well as a flow resistance to the air supplying, and on the other hand, can guide the airflow, benefiting the increase of an air supply range or air supply distance of the side air outlet 3, thus meeting the air supply demand under different working modes of the air conditioner.

[0070] The flow guide member 4 is arranged on at least one of the housing 1 and the air deflector 2. For example, the flow guide member 4 is arranged on the housing 1. For another example, the flow guide member 4 is arranged on the air deflector 2. For yet another example, there are two flow guide members 4, one of which is arranged on the housing 1 and the other is arranged on the air deflector 2. According to embodiments of the present invention, for the air conditioner, the flow guide member 4 connected thorough the above manner simplifies the arrangement of the flow guide member 4, which facilitates the assembly and manufacturing of the flow guide member 4, compared with a solution of integrating the flow guide member 4 in a heat exchanger of the housing 1.

[0071] In some embodiments, as shown in Figs. 11 to 13, the flow guide member 4 includes a flow guide plate 41 provided at the side air outlet 3, dividing the side air outlet 3 into at least two flow guide areas 35. The air blown out by the side air outlet 3 can thus enter different flow guide areas 35 individually, and then be led out of the housing 1 under the guidance of the guide areas 35, so as to improve the diffusion of the air blown out by the side air outlet 3, thereby enlarging the air supplying area.

[0072] Different guide areas 35 may have identical or different air supplying directions, which is not limited in embodiments of the present invention.

[0073] Illustratively, as shown in Figs. 13 and 14, there are a plurality of flow guide plate 41 arranged at the side air outlet 3 at intervals, thus to improve the diffusion of the airflow from the side air outlet 3, thereby enlarging the air supplying area.

[0074] In some embodiments, as shown in Fig. 14, the flow guide member 4 includes a ventilation plate 42 covering the side air outlet 3 and provided with a plurality of ventilation holes 421 punching through the ventilation plate 42 along a thickness direction thereof. Accordingly, on the one hand, the airflow blown from the side air outlet 3 can be scattered by the ventilation plate 42, rendering the air blown out from the side air outlet 3 softer, thereby improving user experience. On the other hand, since the ventilation plate 42 covers the side air outlet 3, dust or foreign matter from the outside can be prevented from entering the housing 1, that is, the ventilation plate 42 has a certain dustproof effect, thereby enhancing the reliability of the air conditioner.

[0075] In some embodiments, as shown in Fig. 15, the flow guide member 4 includes a flow guide fan 43 provided at the side air outlet 3. Accordingly, the flow guide fan 43 can guide the airflow blown out from the side air outlet 3 to diffuse the airflow into all directions,

thus to improve the diffusion of the airflow at the side air outlet 3, thereby enlarging the air supplying area.

[0076] Illustratively, the flow guide fan 43 has a flow guide vane rotatable relative to the housing 1 under the action of airflow. That is, the flow guide fan 43 is a non-powered fan and is rotatable relative to the housing 1 when the airflow passes through it, to guide the airflow thus to improve the diffusion of the airflow, thereby enlarging the air supplying area.

[0077] The flow guide vane has a rotation axis substantially parallel to the left-right direction to improve the air supplying effect of the side air outlet 3.

[0078] In other examples, the flow guide vane is fixed relative to the air deflector 2. The flow guide vane may be in the form of a guide grid or a fixed fan-like structure. When blowing through the flow guide vane, the airflow could be directed to a set area in a room with the guidance of an outer wall surface of the flow guide vane, thereby improving the air supply effect of the air conditioner.

[0079] As shown in Fig. 15, there may be one or more flow guide fan 43. For example, in example of the present invention, there may be two flow guide fans 43 arranged in the side air outlet 3 at intervals. The flow guide fan 43 may be connected with the housing 1, thus facilitating the assembly and manufacturing of the flow guide fan 43.

[0080] In some embodiments, as shown in Figs. 16 to 19, there are a plurality of the through holes 25 arranged at intervals, at least a part of the air deflector 2 is configured as a grid portion 26 formed by ribs, and at least a part of the through holes 25 are formed by grid holes in the grid portion 26.

[0081] According to embodiments of the present invention, as the air deflector 2 is provided with a plurality of through holes 25, the air conditioner can still operate and supply air via the through holes 25 and the side air outlet 3 formed between the air deflector 2 and the housing 1, when the air deflector 2 is reset (i.e., positioned at the first position), thus improving flexibility on air blowing of the air conditioner and rendering air supplying softer, which is beneficial to enhance user experience. Additionally, at least a part of the air deflector 2 is configured as a grid portion 26 formed by ribs, and at least a part of the through holes 25 are formed by grid holes in the grid portion 26, which therefore allows increased arrangement density of the through holes 25 on the basis of ensuring the air deflector 2 with sufficient structural strength, thereby improving the air supplying effect.

[0082] For example, the air deflector 2 may be entirely composed of the grid portion 26. For another example, a part of the air deflector 2 is the grid portion 26, and another part of the air deflector 2 is the non-grid portion 27, which is not limited in the present invention.

[0083] In some embodiments, as shown in Figs. 16 to 18, the ribs include a first rib 261 and a second rib 262 intersected with each other in a same plane or inter-

sected with each other and stacked along the thickness direction of the air deflector 2.

[0084] It would be understood that there are a plurality of the first ribs 261 and a plurality of the second ribs 262, where the first ribs 261 and the second ribs 262 are arranged to intersect with each other, forming the grid holes. The arrangement of the air deflector 2 with the grid portion 26 adopting the above design can further enhance the structural strength of the air deflector 2, thereby reducing the probability of damage caused by collision to the air deflector 2.

[0085] Taking the first rib 261 and the second rib 262 intersected in the same plane as an example. The first rib 261 and the second rib 262 may intersect with each other in the same plane or in the same curved surface. In the case of the air deflector 2 being a flat plate, the first rib 261 and the second rib 262 intersect in the same plane; while in the case of the air deflector 2 being a curved plate, the first rib 261 and the second rib 262 intersect in the same curved surface.

[0086] Taking the first rib 261 and the second rib 262 intersected with each other and stacked along the thickness direction of the air deflector 2 as an example. As shown in Fig. 16, the first rib 261 and the second rib 262 may be located in different planes, i.e., the first rib 261 and the second rib 262 are stacked along the thickness direction of the air deflector 2, thus to increase the thickness of the air deflector 2 while reducing materials, thereby improving the structural stability of the air deflector 2, presenting an attractive appearance with good integrity.

[0087] In some embodiments, at least a part of the ribs are linear ribs or curved ribs. It should be understood that the ribs may extend in a path either linear or curved.

[0088] In an example, as shown in Fig. 17, all of the ribs are linear, and there is an included angle between the extending path of the linear rib and the widthwise direction of the air deflector 2. That is, the linear ribs are arranged obliquely, which benefits the appearance integrity of the air deflector 2 and facilitates processing and manufacturing thereof.

[0089] In another example, as shown in Fig. 18, all of the ribs are curved, where the curved rib may extend in a path being C-shaped, S-shaped or other curved shapes, thereby improving the integrity of the air deflector 2 and presenting an attractive appearance.

[0090] In some embodiments, as shown in Figs. 17 to 19, the through hole 25 includes a first through hole 251 and a second through hole 252, and the air deflector 2 includes the grid portion 26 and a non-grid portion 27, where the first through hole 251 is formed by the grid hole of the grid portion 26, and the second through hole 252 is formed in the non-grid portion 27. It should be understood that an area provided with the second through hole 252 in the air deflector 2 is of a non-grid structure, that is, there are two types of holes, the grid holes (i.e. the first through hole 251) and non-grid holes

(i.e. the second through hole 252) one the air deflector 2, which increases the diversity of air supplying by the air deflector 2, and has an attractive appearance with good integrity.

[0091] Illustratively, at least one of a sectional area, distribution density and cross sectional shape of the first through hole 251 and the second through hole 252 is different, thus increasing the diversity of air supplying by the air deflector 2, and presenting an attractive appearance with good integrity.

[0092] For example, the first through hole 251 and the second through hole 252 may be circular, elliptical, or polygonal in outline. The first through hole 251 may have a sectional area different from or the same as that of the second through hole 252, which is not limited in embodiments of the present invention.

[0093] In some embodiments, at the first position, the side air outlet 3 has an air outlet sectional area A, and the housing 1 has a projected area B of the outer peripheral contour in a projective plane orthogonal to the lengthwise direction of the air deflector 2, where $0 < A/B \leq 8\%$.

[0094] According to embodiments of the present invention, a relationship between the air outlet sectional area of the side air outlet 3 and the projected area of the outer peripheral contour of the housing 1 is defined in the case of the air deflector 2 being at the first position, which not only ensures normal side air supplying of the air conditioner at the first position, but also avoids the problem that parts inside the housing 1 are directly observable to a user via the side of the air conditioner due to an excessively large air outlet sectional area of the side air outlet 3, thus to improve the integrity of the appearance of the air conditioner, thereby providing better user experience.

[0095] It should be understood that with a ratio of A/B greater than 8%, the user can directly observe parts such as the heat exchanger inside the housing 1 and a driving mechanism of the air deflector 2 from the side of the air conditioner, thus negatively affecting the appearance integrity of the air conditioner. In addition, in the condition of the area of the side air outlet 3 being too large, dust or foreign matter from the outside is prone to enter the housing 1 through the side air outlet 3, which adversely impacts on the cleanliness inside the air conditioner thereby reducing the reliability of the air conditioner.

[0096] Optionally, $0.8\% \leq A/B \leq 5\%$. It would be understood that the ratio of A/B should be equal to or greater than 0.8% to ensure normal side air supplying of the air conditioner and thus meet the need of side air supplying by the air conditioner, in the case of the air deflector 2 being at the first position. Additionally, the ratio of A/B should be less than or equal to 5% so as to reduce an area occupied by the side air outlet 3 as much as possible, on the basis of ensuring the air conditioner for normal side air supplying.

[0097] Illustratively, the ratio of A/B may be 0.8%,

1%, 1.5%, 2%, 2.5%, 3%, 3.5%, 4%, 4.5% or 5%.

[0098] Optionally, $500\text{mm}^2 \leq A \leq 3000\text{mm}^2$. For example, A may be 500mm^2 , 1000mm^2 , 1500mm^2 , 2000mm^2 , 2500mm^2 or 3000mm^2 . The air conditioner according to embodiments of the present invention adopting the above area A is able to meet side air outlet requirements of most wall-mounted air conditioners, and has good side air supplying effect.

[0099] Correspondingly, the projected area B of the outer peripheral contour of the housing 1 in the projective plane orthogonal to the lengthwise direction of the air deflector 2 may be selected from 5000mm^2 to 7000mm^2 . For example, B may be 5000mm^2 , 6000mm^2 or 7000mm^2 , to satisfy the layout of components inside the housing 1.

[0100] In the specification, it should be understood that, the terms indicating orientation or position relationship such as "central", "longitudinal", "lateral", "length(wise)", "width(wise)", "thickness", "above", "below", "front", "rear", "right", "left", "vertical", "horizontal", "top", "bottom", "inner", "outer", "clockwise", "counterclockwise", "axial", "radial" and "circumferential" should be construed to refer to the orientation or position relationship as then described or as shown in the drawings. These terms are merely for convenience and concision of description and do not alone indicate or imply that the device or element referred to must have a particular orientation or must be configured or operated in a particular orientation. Thus, it cannot be understood to limit the present invention.

[0101] In addition, terms such as "first" and "second" are used herein for purposes of description and are not intended to indicate or imply relative importance or significance or impliedly indicate quantity of the technical feature referred to. Thus, the feature defined with "first" and "second" may comprise one or more this feature. In the description of the present invention, "a plurality of" means two or more than two this features, such as two, three, etc., unless specified otherwise.

[0102] In the present invention, unless specified or limited otherwise, the terms "mounted", "connected", "coupled", "fixed" and the like are used broadly, and may be, for example, fixed connections, detachable connections, or integrated connections; may also be mechanical or electrical connections or be communicable with each other; may also be direct connections or indirect connections via intervening structures; may also be inner communications of two elements or mutual interaction between two elements, which can be understood by those skilled in the art according to specific situations.

[0103] In the present invention, unless specified or limited otherwise, a structure in which a first feature is "on" or "below" a second feature may be an embodiment in which the first feature is in direct contact with the second feature, or an embodiment in which the first feature and the second feature are contacted indirectly via an intermediation. Furthermore, a first feature "on",

"above" or "on top of" a second feature may be an embodiment in which the first feature is right or obliquely "on", "above" or "on top of" the second feature, or just means that the first feature is at a height higher than that of the second feature; while a first feature "below", "under" or "on bottom of" a second feature may be an embodiment in which the first feature is right or obliquely "below", "under" or "on bottom of" the second feature, or just means that the first feature is at a height lower than that of the second feature.

[0104] Reference throughout this specification to "an embodiment", "some embodiments", "one embodiment", "another example", "an example", "a specific example", or "some examples," means that a particular feature, structure, material, or characteristic described in connection with the embodiment or example is included in at least one embodiment or example of the present invention. Thus, the appearances of the phrases such as "in some embodiments", "in one embodiment", "in an embodiment", "in another example", "in an example", "in a specific example," or "in some examples," in various places throughout this specification are not necessarily referring to the same embodiment or example of the present invention. Furthermore, the particular features, structures, materials, or characteristics may be combined in any suitable manner in one or more embodiments or examples. Besides, any different embodiments and examples and any different characteristics of embodiments and examples may be combined by those skilled in the art without contradiction.

[0105] Although explanatory embodiments have been shown and described, it would be appreciated by those skilled in the art that the above embodiments cannot be construed to limit the present invention, and changes, alternatives, and modifications can be made in the embodiments in the scope of the present invention.

Claims

1. An air conditioner, comprising:

a housing (1) provided with an air outlet (11); and
an air deflector (2), having a first side (21) and a second side (22) opposite to each other along a lengthwise direction of the air deflector (2), and a third side (23) and a fourth side (24) opposite to each other along a widthwise direction of the air deflector (2), with a through hole (25) being formed along a thickness direction of the air deflector (2), and the air deflector (2) being movably connected with the housing (1) between a first position and a second position, wherein
at the first position, a side air outlet (3) is

- formed between at least one of the first side (21) and the second side (22) and the housing (1), and the air inside the housing (1) blows out through the through hole (25) and the side air outlet (3); and
 at the second position, the air inside the housing (1) blows out through the through hole (25), at least one of the first side (21) and the second side (22), and at least one of the third side (23) and the fourth side (24).
2. The air conditioner according to claim 1, wherein at least a part of an outer peripheral contour of the side air outlet (3) is arc-shaped, in a plane orthogonal to the lengthwise direction of the air deflector (2).
 3. The air conditioner according to claim 2, wherein the outer peripheral contour of the side air outlet (3) comprises a first contour portion (31) defined by the air deflector (2) and a second contour portion (32) defined by the housing (1), at least a part of at least one of the first contour portion (31) and the second contour portion (32) is arc-shaped.
 4. The air conditioner according to claim 3, wherein one contour portion of the first contour portion (31) and the second contour portion (32) is arc-shaped, and the other contour portion is linear-shaped.
 5. The air conditioner according to claim 4, wherein said one contour portion of the first contour portion (31) and the second contour portion (32) is of an arc-shape convex towards or away from said the other contour portion.
 6. The air conditioner according to claim 3, wherein the first contour portion (31) and the second contour portion (32) are both arc-shaped, the first contour portion (31) is convex towards or away from the second contour portion (32), and a convex direction of the first contour portion (31) is opposite to or identical with that of the second contour portion (32).
 7. The air conditioner according to claim 1, wherein the outer peripheral contour of the side air outlet (3) comprises a first contour portion (31) defined by the air deflector (2) and a second contour portion (32) defined by the housing (1), at least a part of the first contour portion (31) and at least a part of the second contour portion (32) are both linear-shaped.
 8. The air conditioner according to any one of claims 1 to 7, wherein the side air outlet (3) comprises a first side air outlet (33) formed by the first side (21) of the air deflector (2) and the housing (1) and a second side air outlet (34) formed by the second side (22) of the air deflector (2) and the housing (1).
 9. The air conditioner according to any one of claims 1 to 8, wherein the air conditioner further comprises a flow guide member (4) provided at the side air outlet (3) and arranged on at least one of the housing (1) and the air deflector (2).
 10. The air conditioner according to claim 9, wherein the flow guide member (4) comprises a flow guide plate (41) provided at the side air outlet (3), dividing the side air outlet (3) into at least two flow guide areas (35); and/or
 the flow guide member (4) comprises a ventilation plate (42) covering the side air outlet (3) and provided with a plurality of ventilation holes (421) punching through the ventilation plate (42) along a thickness direction thereof; and/or
 the flow guide member (4) comprises a flow guide fan (43) provided at the side air outlet (3).
 11. The air conditioner according to any one of claims 1 to 10, wherein there are a plurality of the through holes (25) arranged at intervals, at least a part of the air deflector (2) is configured as a grid portion (26) formed by ribs, and at least a part of the through holes (25) are formed by grid holes in the grid portion (26).
 12. The air conditioner according to claim 11, wherein the ribs comprise a first rib (261) and a second rib (262) intersected with each other in a same plane or intersected with each other and stacked along the thickness direction of the air deflector (2), and/or
 at least a part of the ribs are linear ribs or curved ribs; and/or
 the through hole (25) comprises a first through hole (251) and a second through hole (252), and the air deflector (2) comprises the grid portion (26) and a non-grid portion (27), wherein the first through hole (251) is formed by the grid hole of the grid portion (26), and the second through hole (252) is formed in the non-grid portion (27).
 13. The air conditioner according to any one of claims 1 to 12, wherein at the first position, the side air outlet (3) has an air outlet sectional area A, and the housing (1) has a projected area B of the outer peripheral contour in a projective plane orthogonal to the lengthwise direction of the air deflector (2),

wherein $0 < A/B \leq 8\%$.

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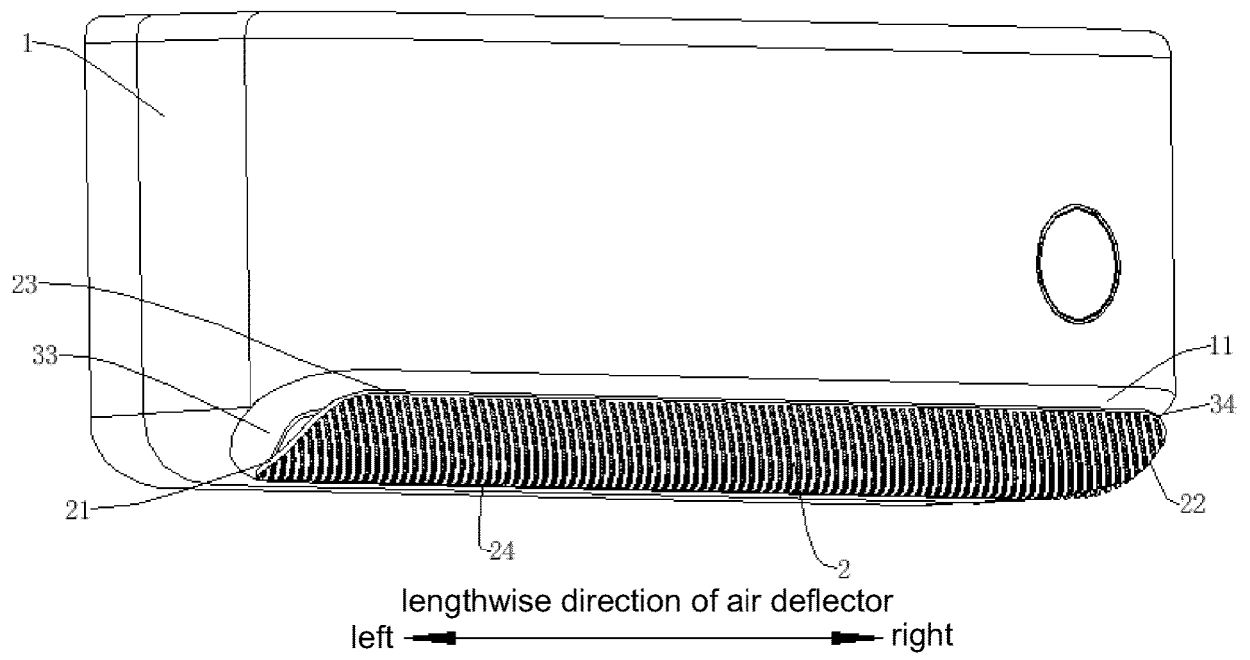


Fig. 1

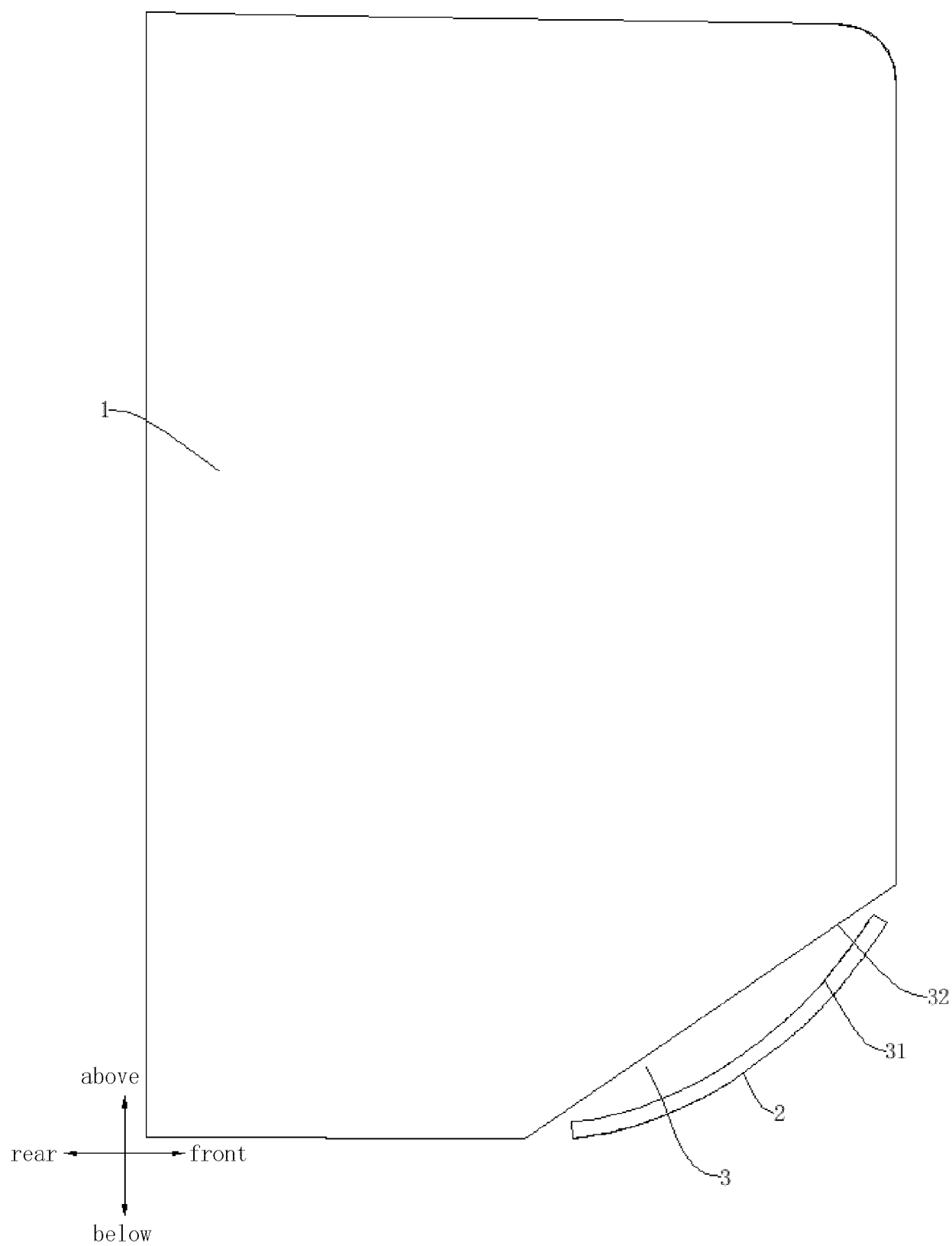


Fig. 2

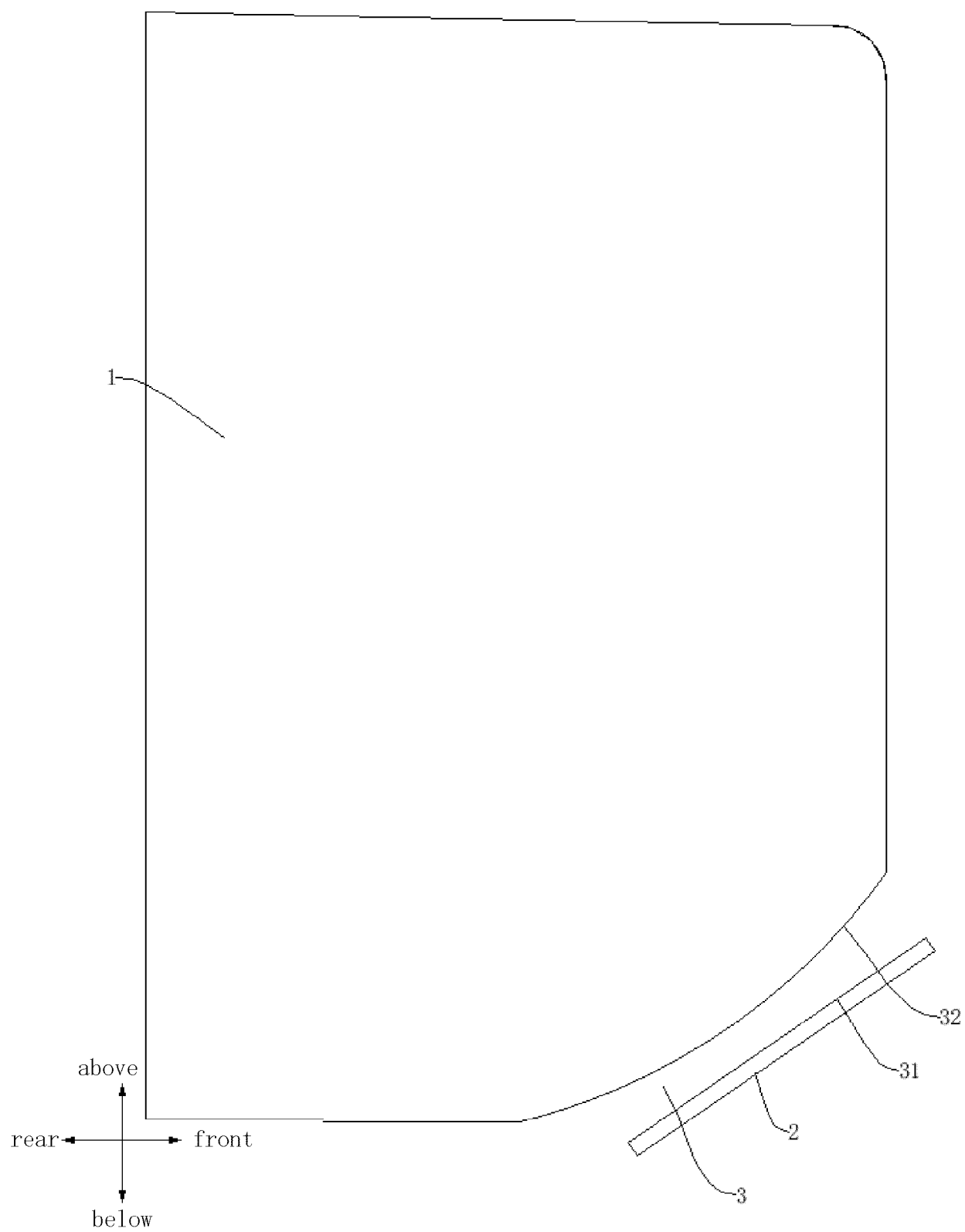


Fig. 3

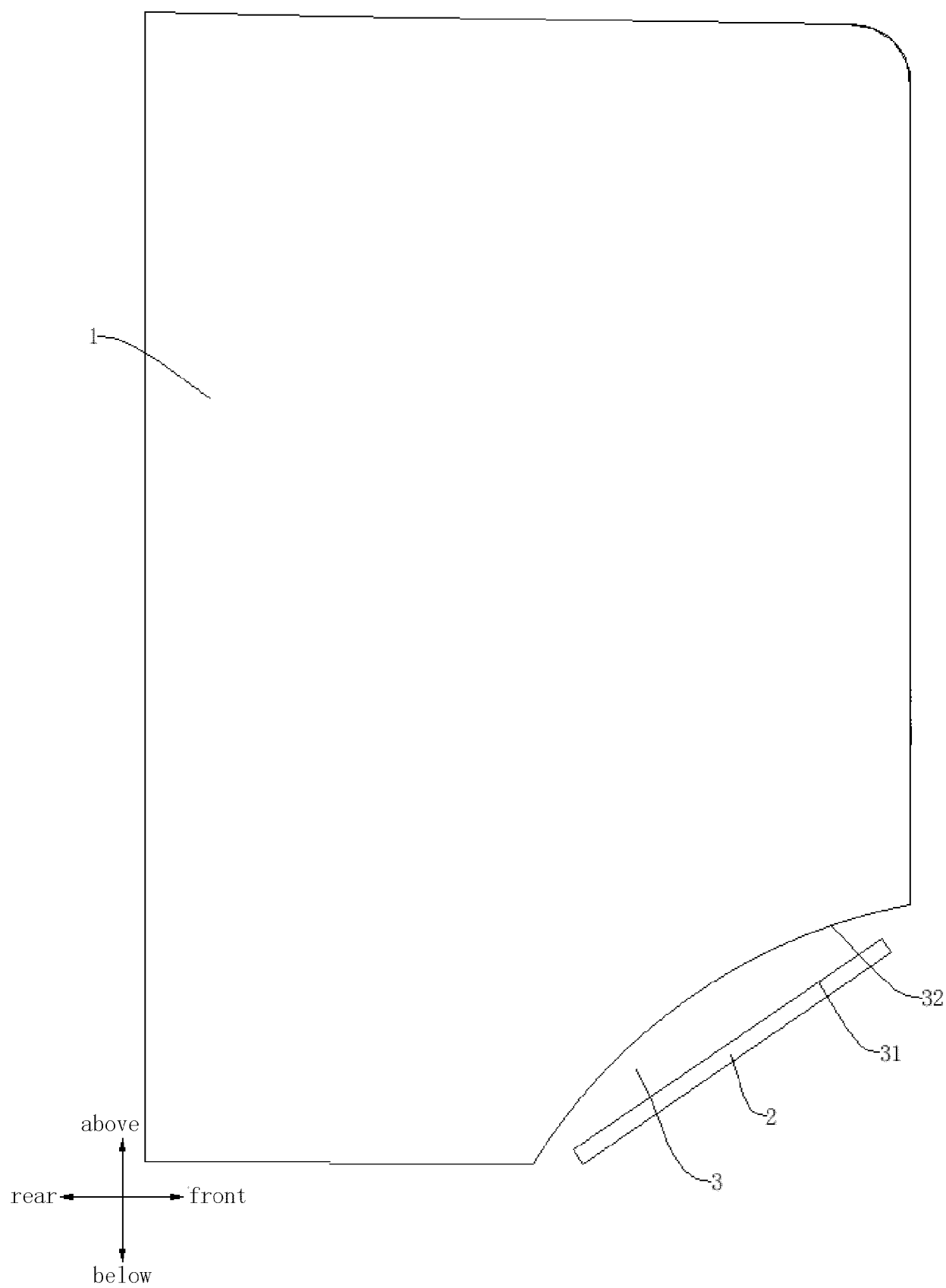


Fig. 4

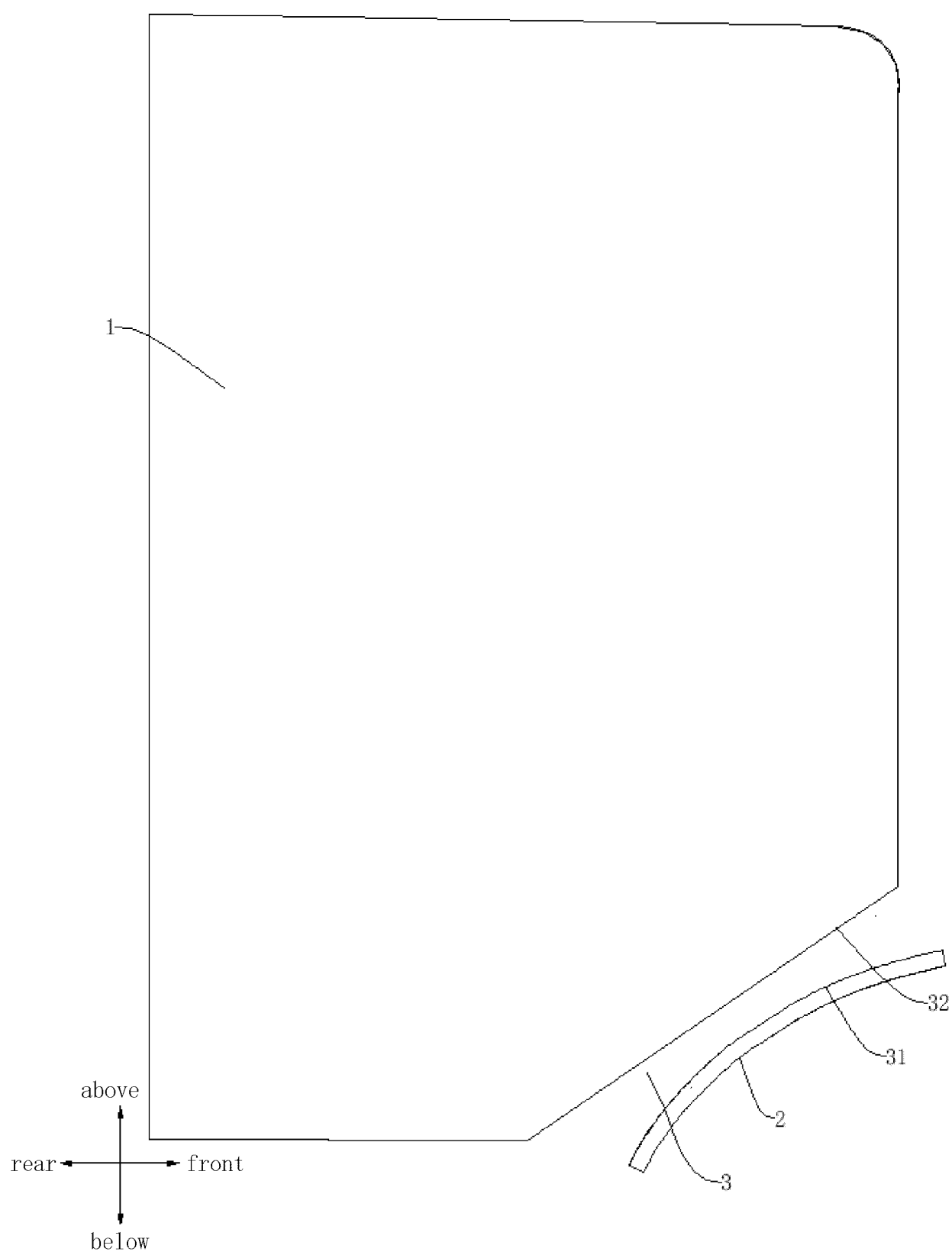


Fig. 5

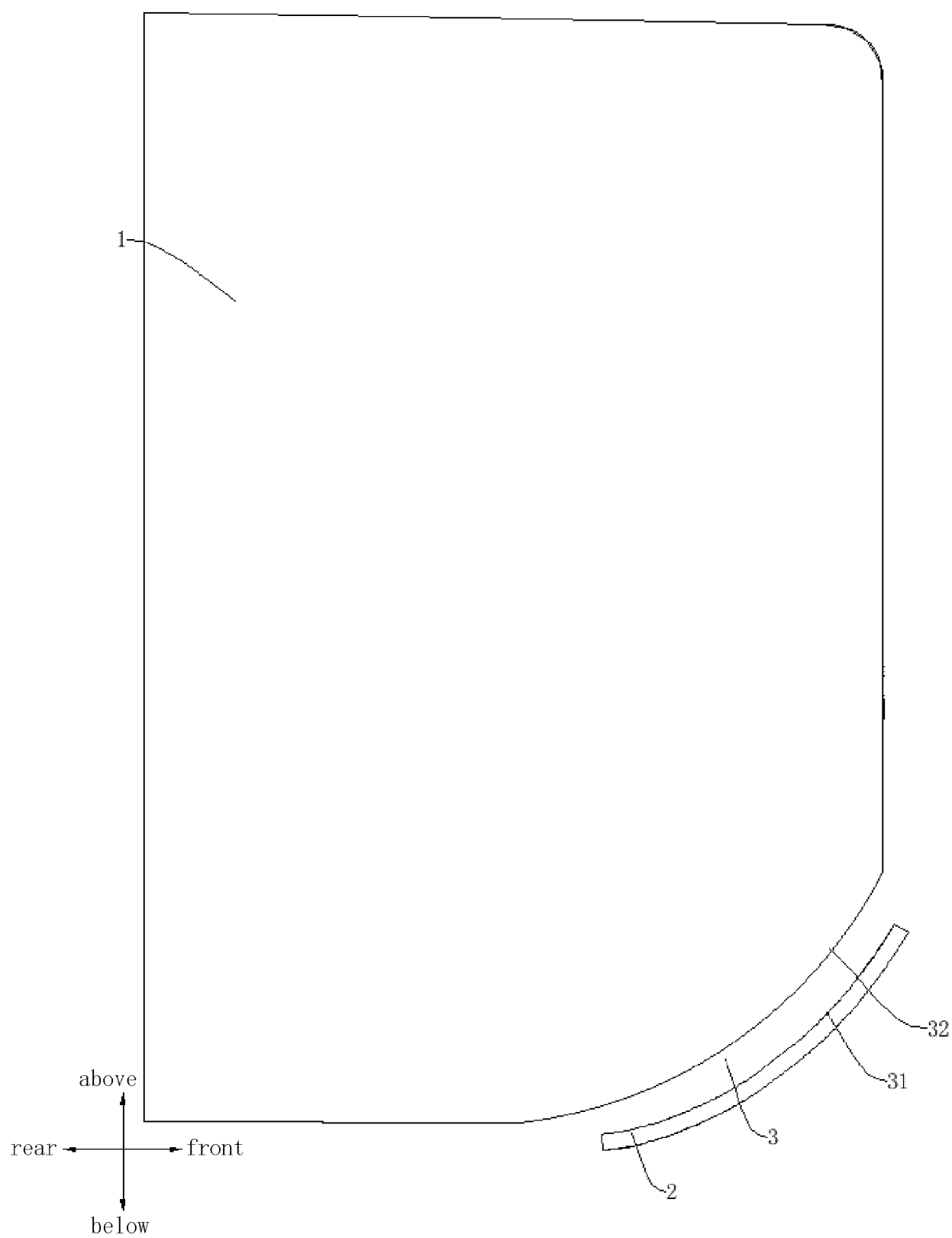


Fig. 6

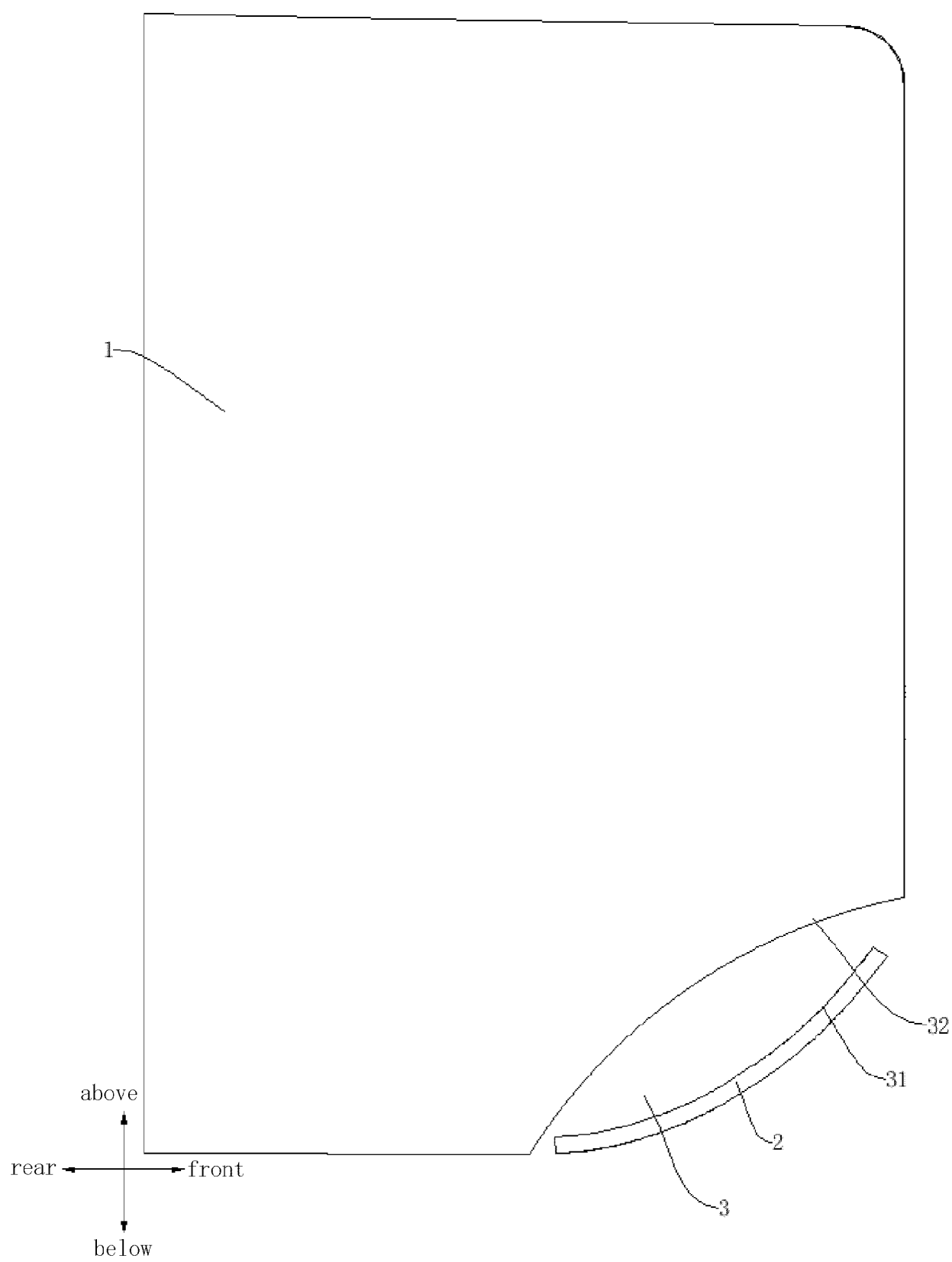


Fig. 7

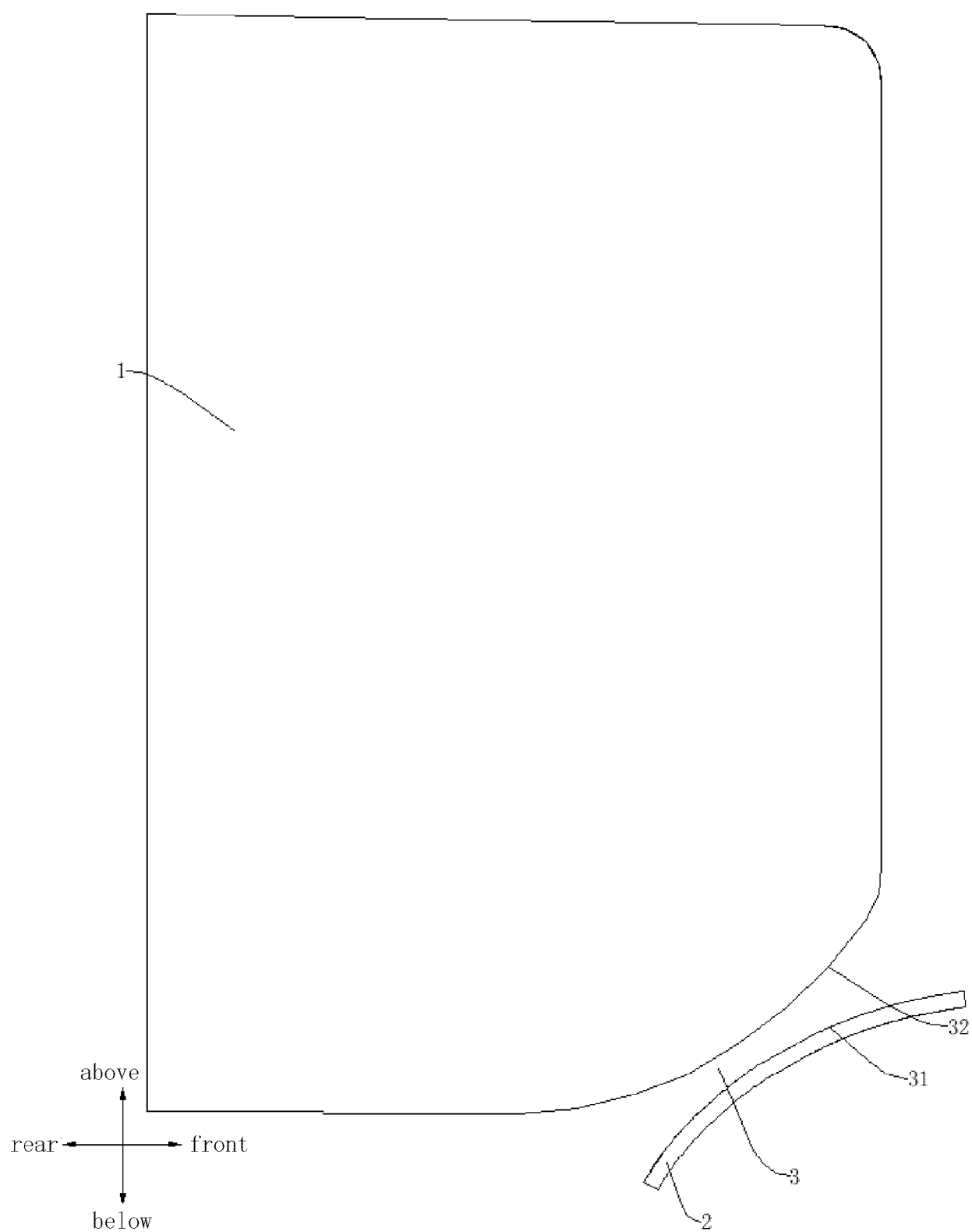


Fig. 8

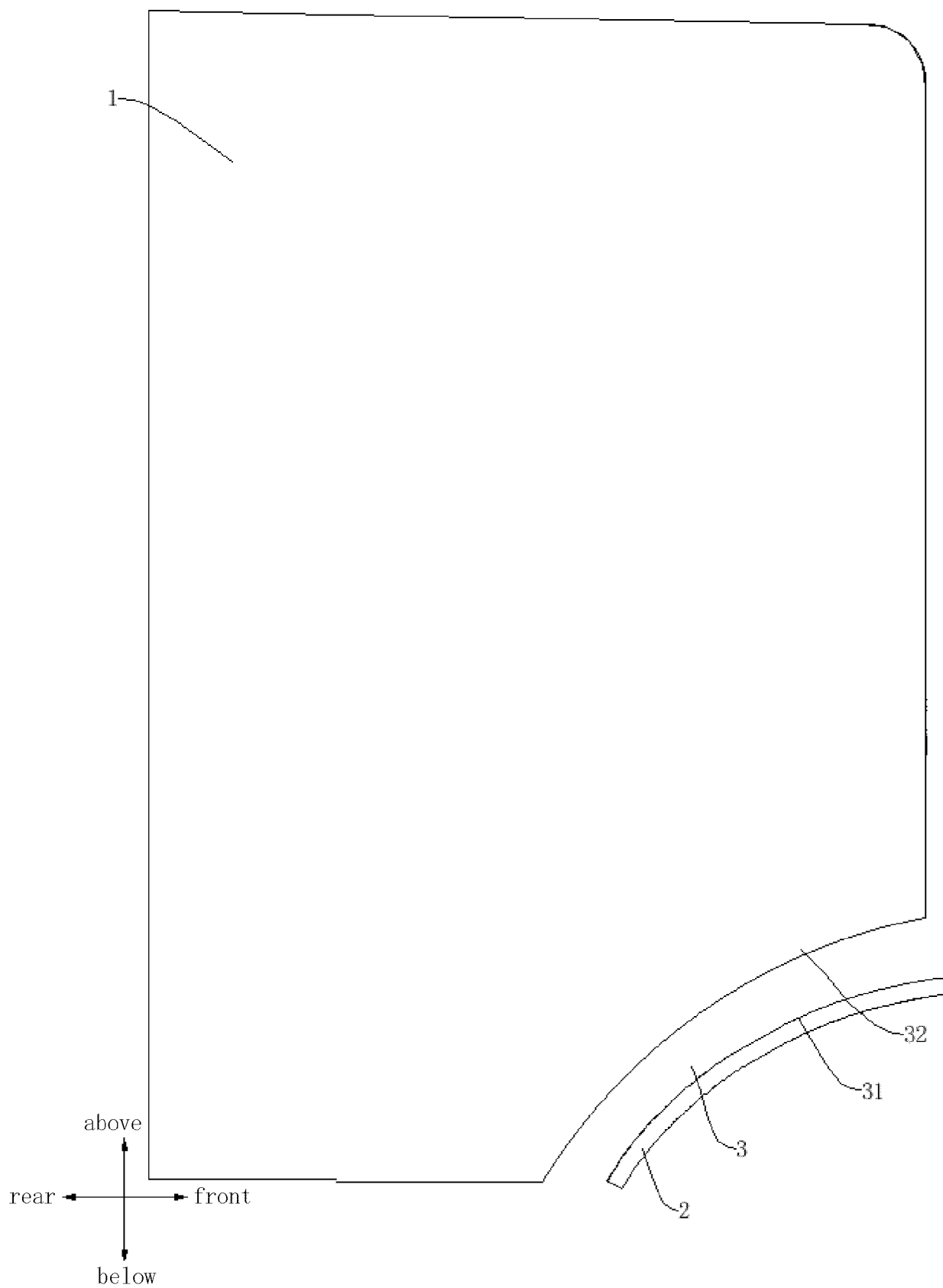


Fig. 9

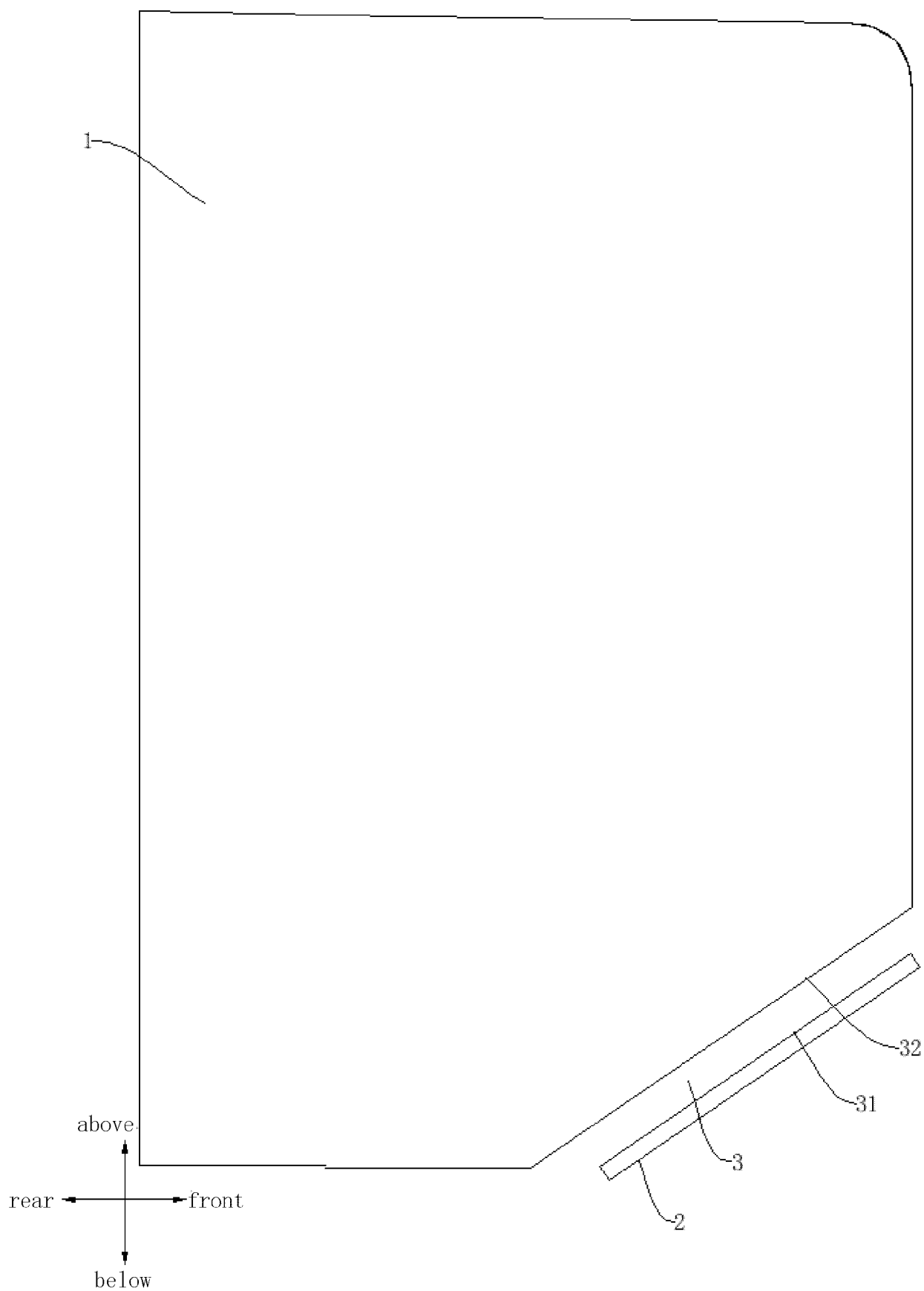


Fig. 10

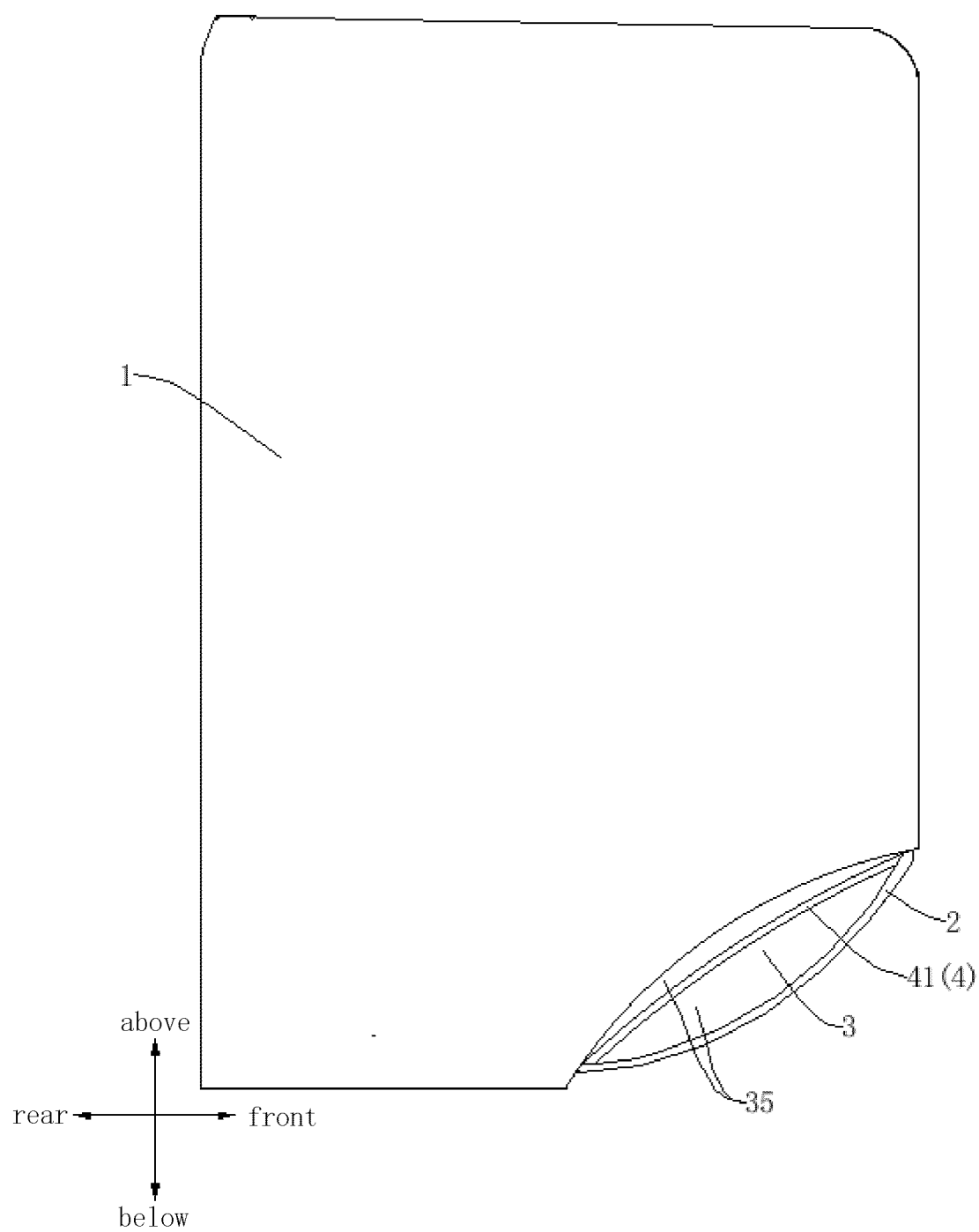


Fig. 11

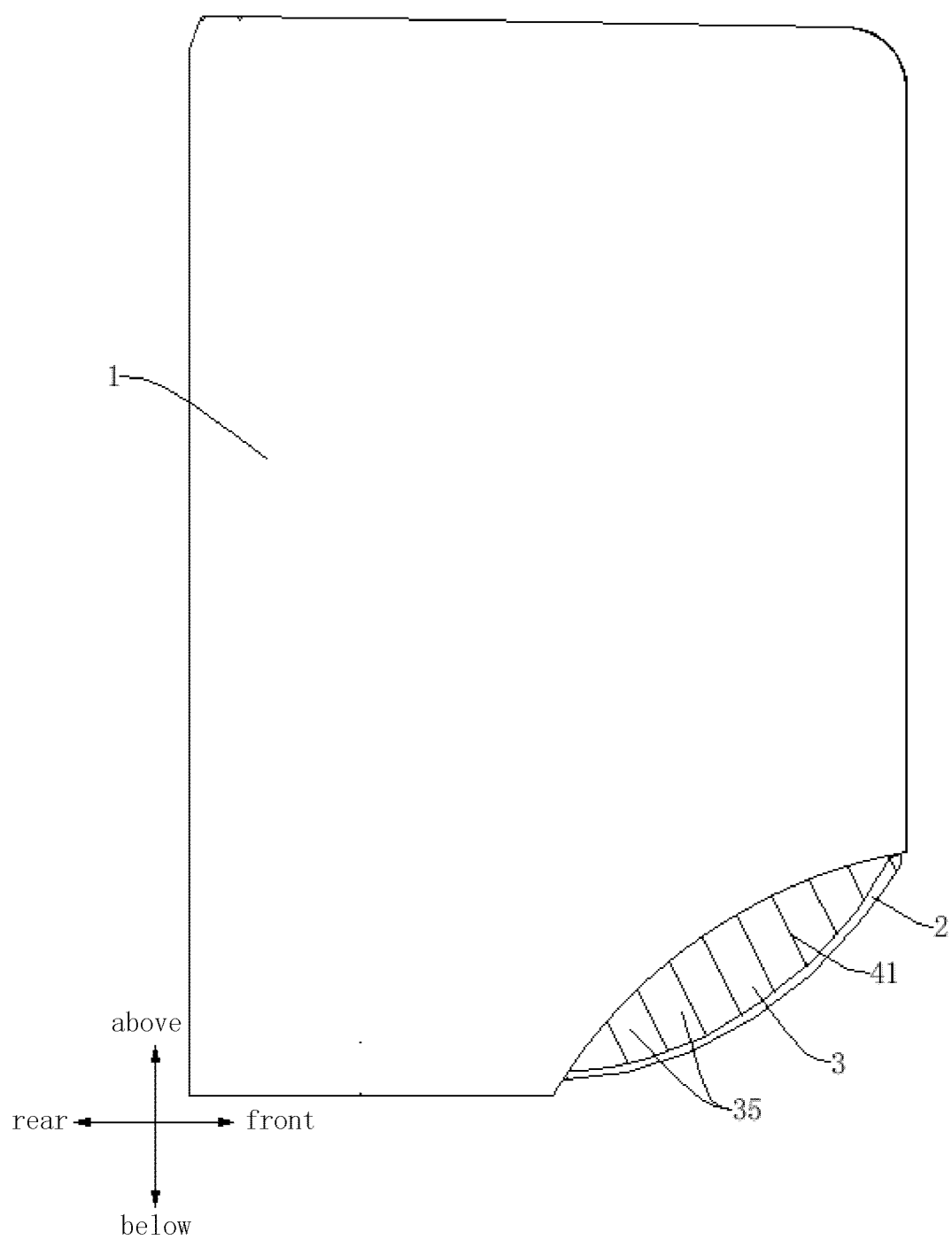


Fig. 12

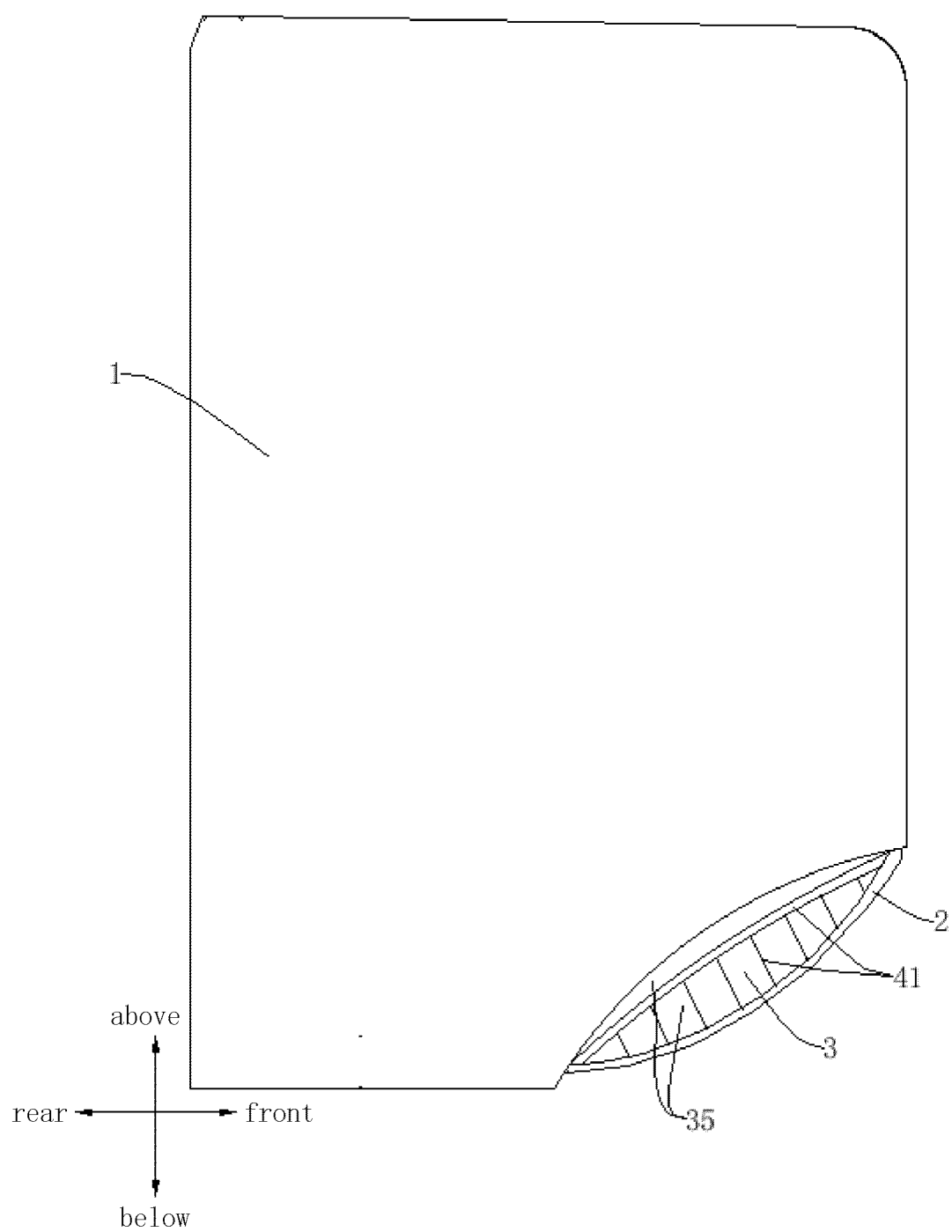


Fig. 13

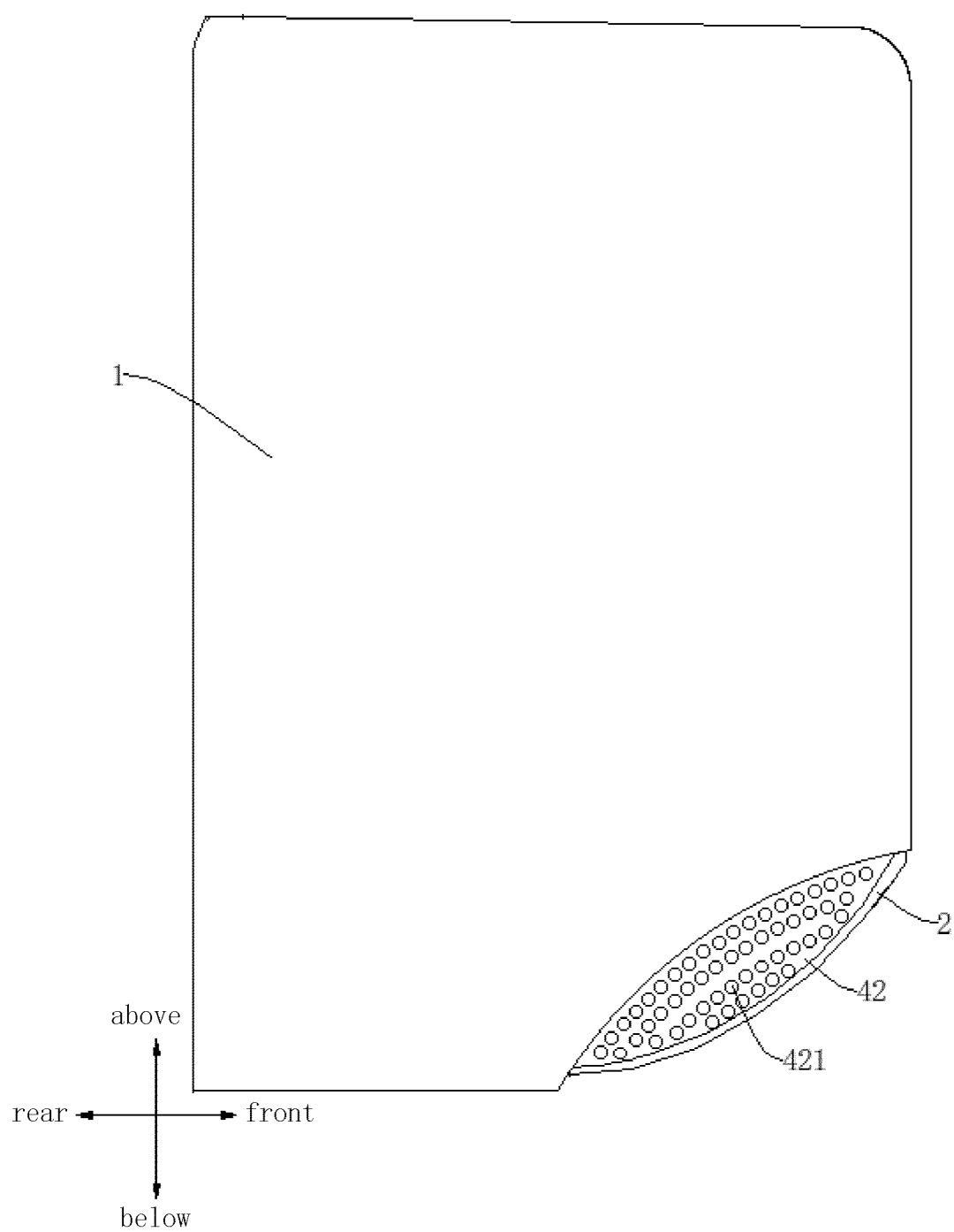


Fig. 14

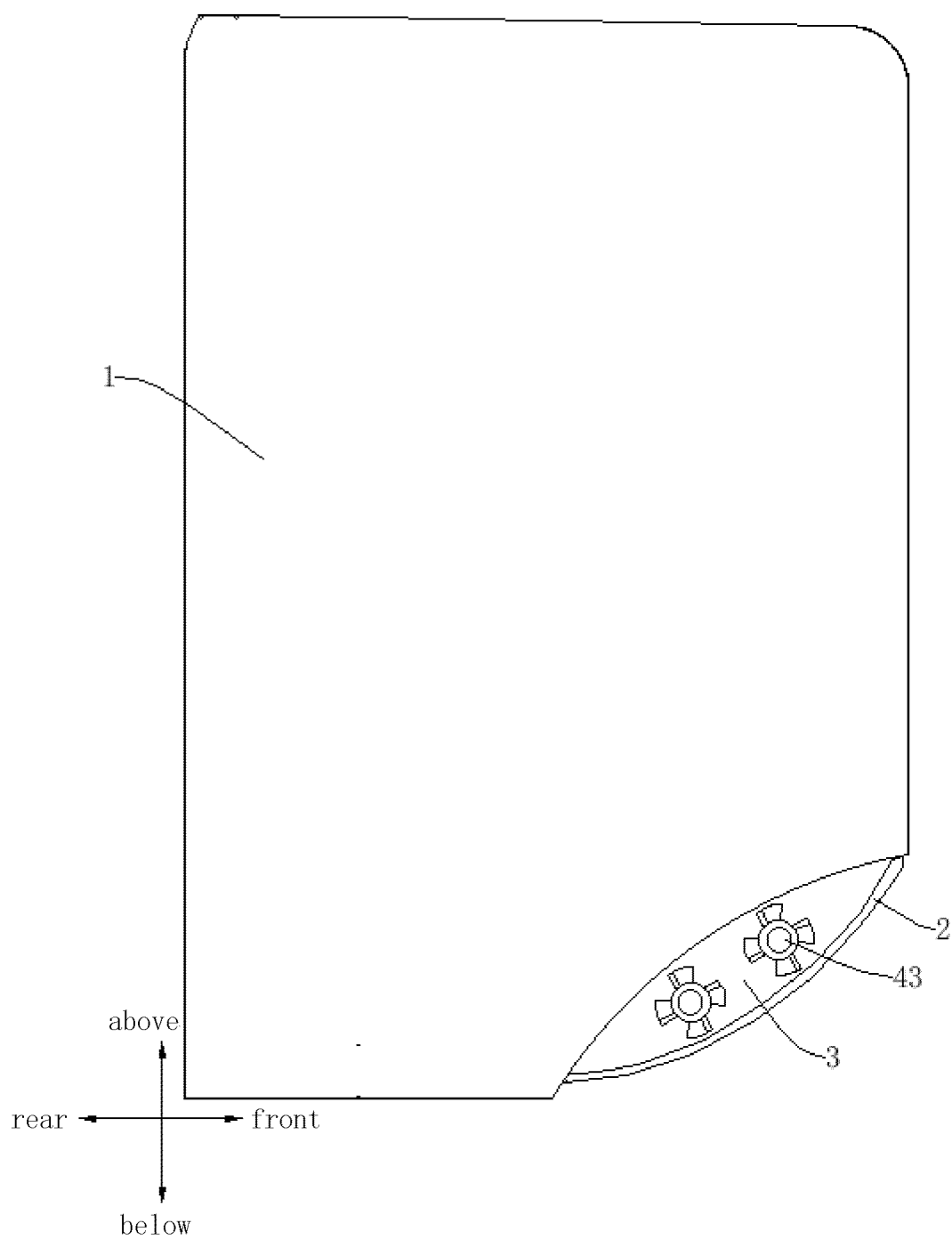


Fig. 15

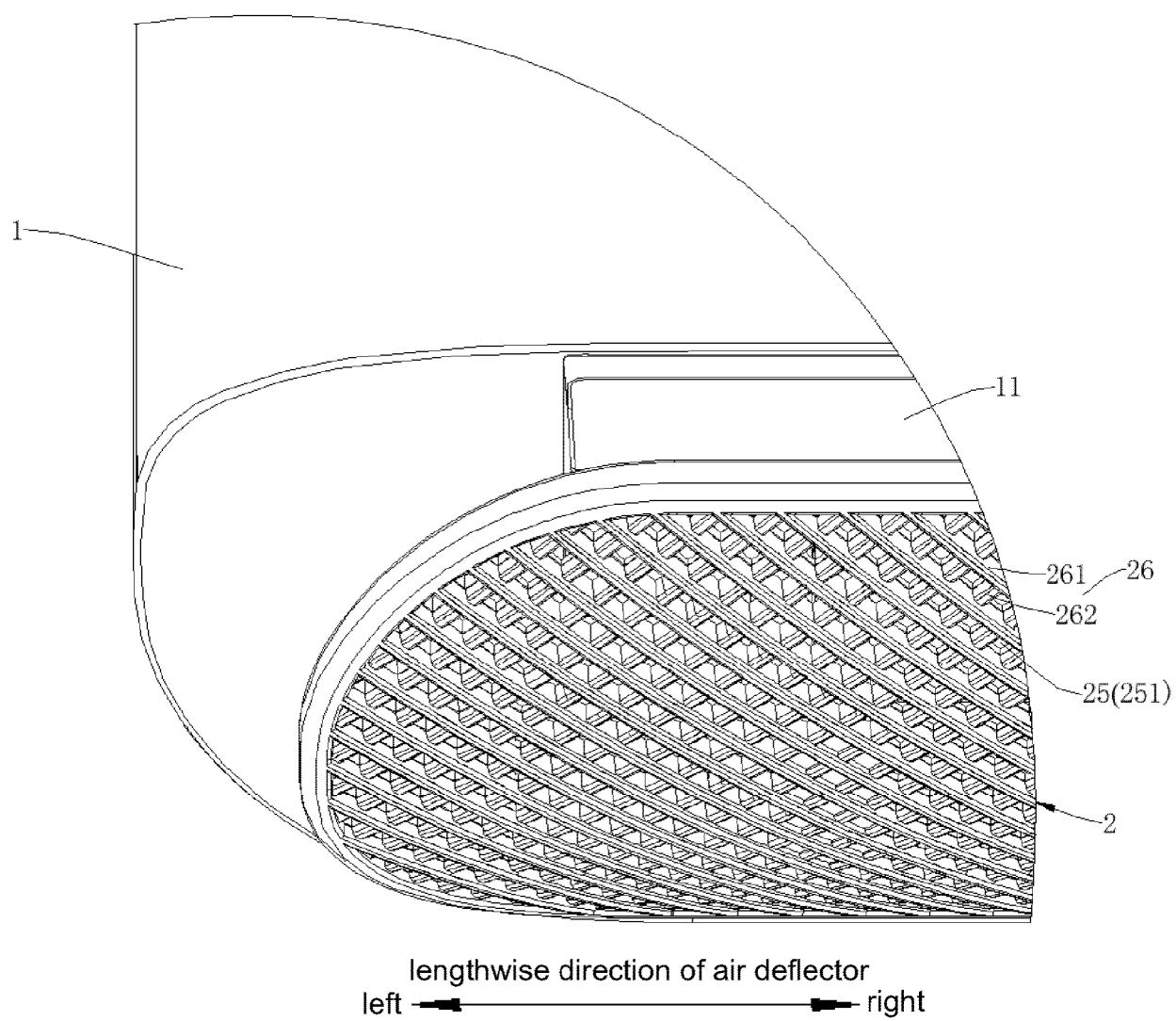


Fig. 16

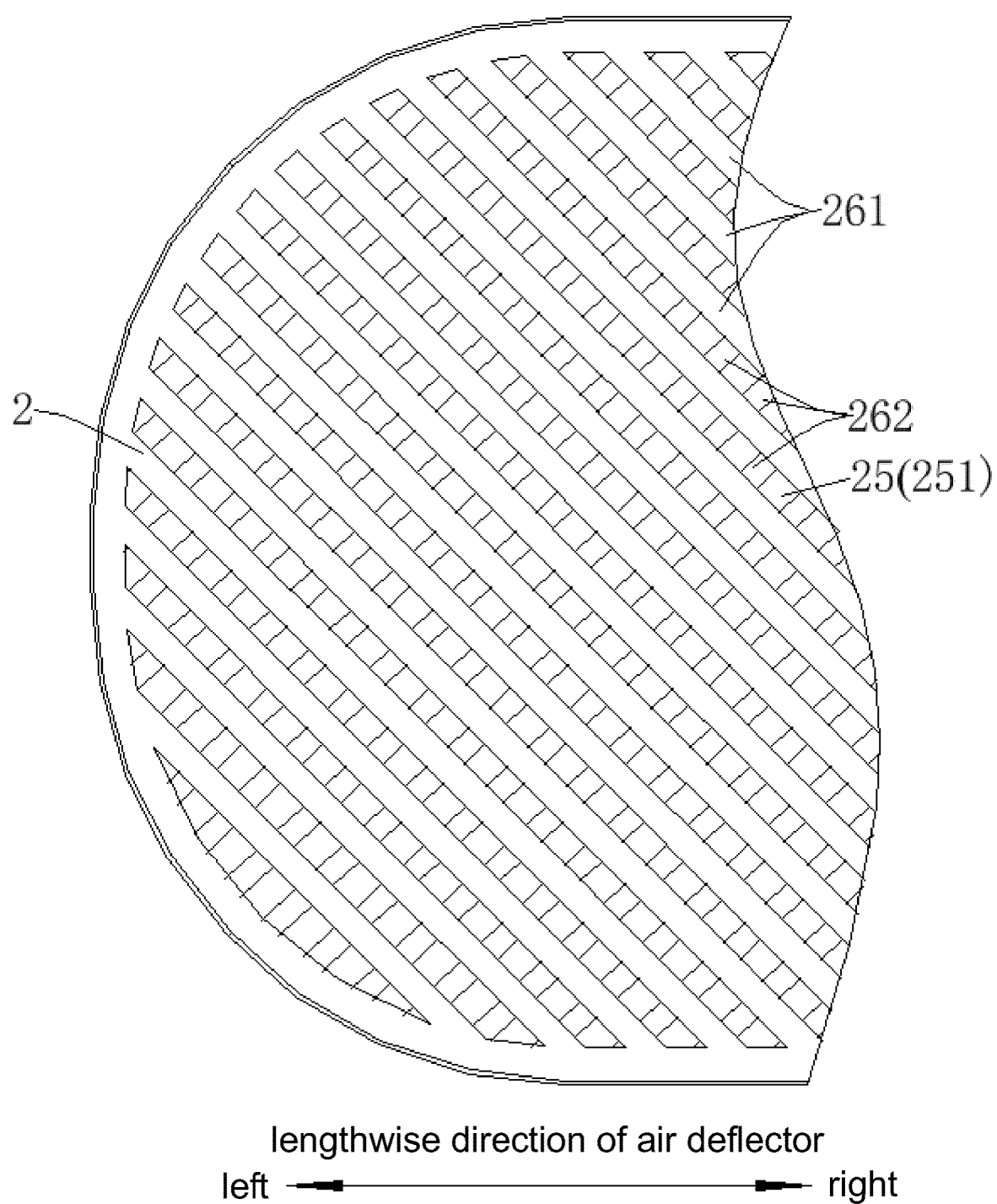


Fig. 17

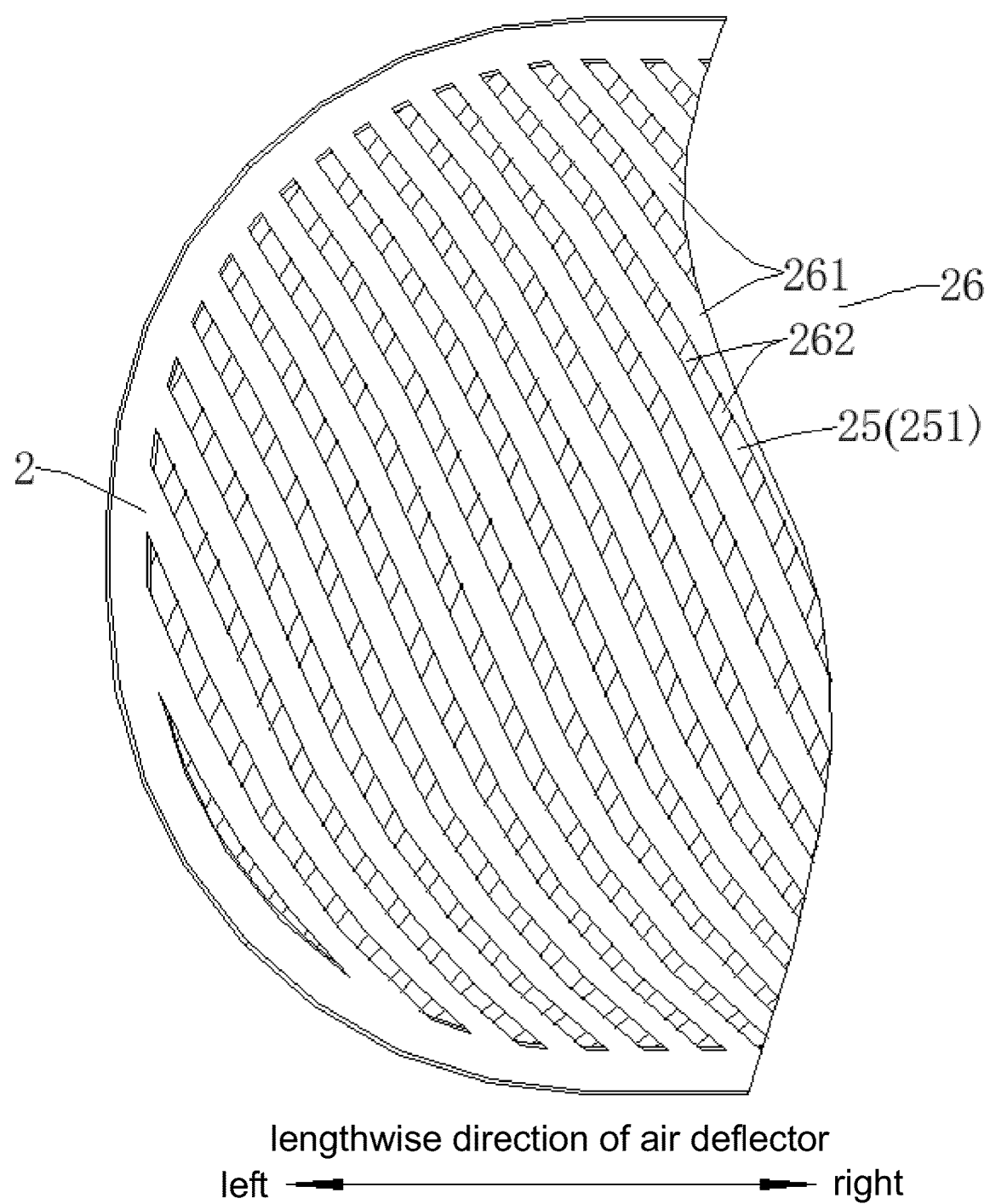


Fig. 18

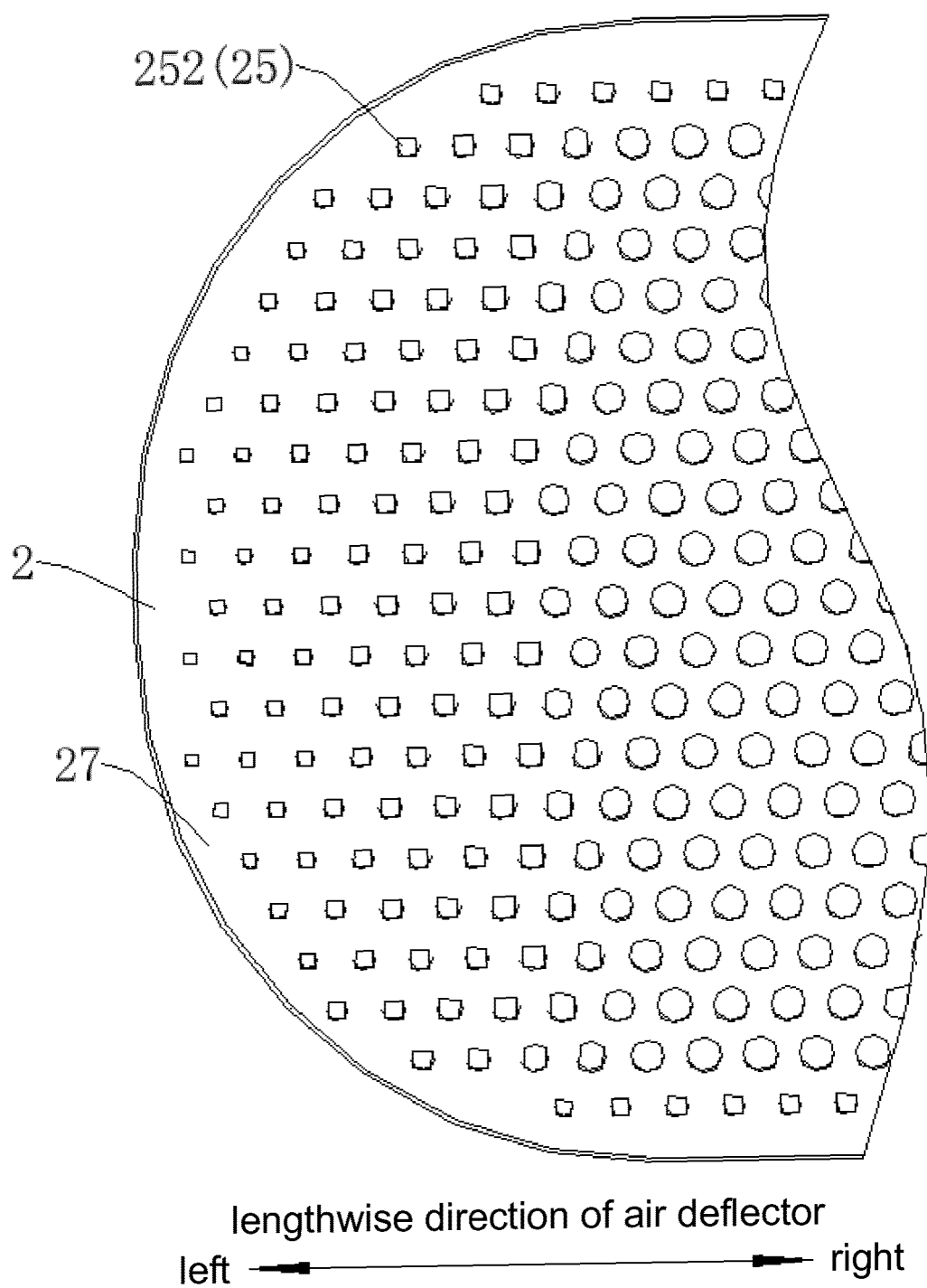


Fig. 19



EUROPEAN SEARCH REPORT

Application Number

EP 25 20 5549

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A	CN 114 110 768 A (GUANGDONG MIDEA AIR-CONDITIONING EQUIPMENT CO LTD; MIDEA GROUP CO LTD) 1 March 2022 (2022-03-01) * the whole document * -----	1-13	
A	CN 107 525 139 A (GUANGDONG MIDEA REFRIGERATION EQUIPMENT CO LTD; MIDEA GROUP CO LTD) 29 December 2017 (2017-12-29) * the whole document * -----	1-13	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			F24F
Place of search			Examiner
Munich			Arndt, Markus
Date of completion of the search			
19 February 2026			
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

EP 25 20 5549

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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