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(54) **AIR GUIDE STRUCTURE**

(57) Disclosed is an air guide structure. The air guide structure includes an air delivery passage (16); an end part of the air delivery passage (16) is formed into an air outlet (15); the air delivery passage (16) includes a first wall (17) and a second wall (122) that are provided oppositely; an air guide plate (18) is provided below the air outlet (15) and is positioned between the first wall (17) and the second wall (122); the air guide plate (18) is ex-

tended along a forward direction and a backward direction; and a height of an upper edge (183) of the air guide plate (18) is not greater than that of a lower edge of the air outlet (15). The structure can improve the aesthetics of an air conditioning device without influencing an air guide function.

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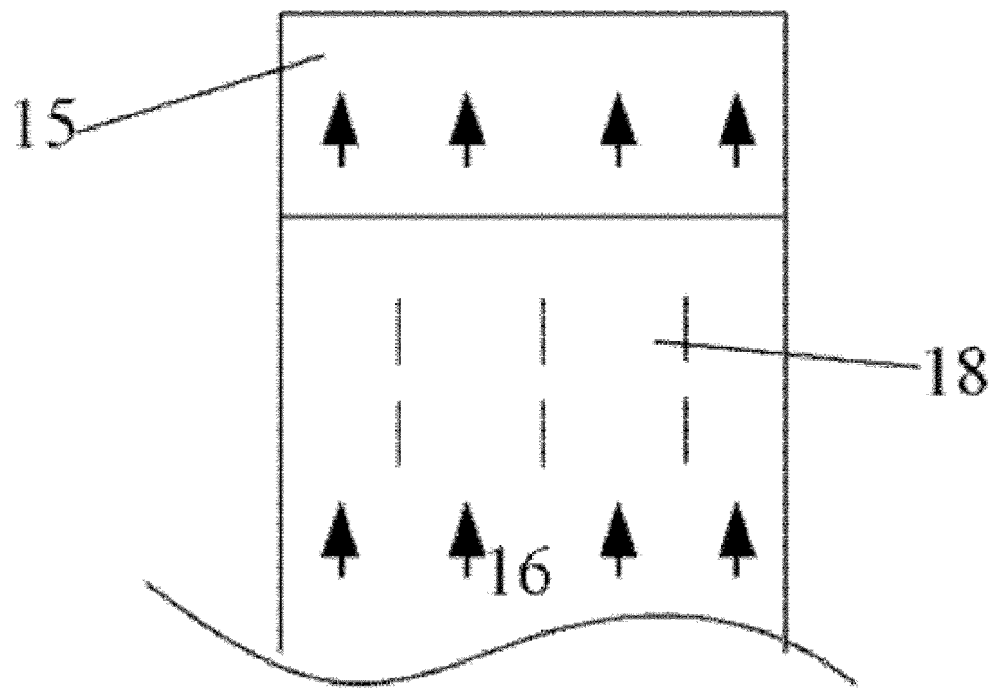


Fig. 1c

Description

[0001] This application claims the priority to the Chinese patent application No. 201510577920.4, filed with the Chinese Patent Office on September 11, 2015 and entitled "Air guide structure", an entire content of which is incorporated herein by reference.

Technical Field

[0002] The present disclosure relates to a field of air conditioning devices, relates to an electrical device used for regulating indoor air such as an air conditioner, a fan and an air purifier, and particularly relates to an air guide structure.

Background

[0003] At present, an air guide plate or an air guide grid for controlling an air-out direction is generally provided at an air outlet of an air conditioning device on a market. The air guide baffle plate or an air guide grid is often provided at the air outlet and a position thereof is very striking, which is not beneficial to overall aesthetics of the air conditioning device. In the prior art, there lacks an air outlet structure in which the air guide plate or the air guide grid can be hidden in the air outlet such that a user cannot directly observe the air guide plate or the air guide grid from an outside.

Summary

[0004] In light of this, the present disclosure provides an air guide structure capable of hiding an air guide plate in an air outlet.

[0005] To this end, the following technical solutions are adopted by the present disclosure.

[0006] An air guide structure comprises an air delivery passage; an end part of the air delivery passage is formed into an air outlet; the air delivery passage comprises a first wall and a second wall that are provided oppositely; an air guide plate is provided below the air outlet and is positioned between the first wall and the second wall; the air guide plate is extended along a forward direction and a backward direction; a height of an upper edge of the air guide plate is not greater than a height of a lower edge of the air outlet.

[0007] Preferably, in the above air guide structure, the air delivery passage is obliquely extended upward and forward; the first wall is provided at a lower side, and the second wall is provided at an upper side.

[0008] Preferably, in the above air guide structure, the first wall is formed by a first horn structure which is hollow overall and whose outer diameter is gradually increasing from a lower end to an upper end; the second wall is formed by a second horn structure which is hollow overall and whose outer diameter is gradually increasing from a lower end to an upper end; the second horn structure is

provided at a periphery of the first horn structure from below in a sleeving manner; an upper edge of the first horn structure and an upper edge of the second horn structure are respectively formed into the lower edge and an upper edge of the air outlet; the air guide plate is provided on a radial outer sidewall at a front side of the first horn structure and/or on a radial inner sidewall at a front side of the second horn structure.

[0009] Preferably, in the above air guide structure, the upper edge of the first horn structure and the upper edge of the second horn structure are obliquely provided in a same direction relative to a horizontal direction.

[0010] Preferably, in the above air guide structure, the second horn structure comprises a first edge located at a front side and provided at a lowest position, and a second edge located at a rear side and provided at a highest position; the air guide plate is provided near the first edge of the second horn structure; the height of the upper edge of the air guide plate is not greater than that of the first edge of the second horn structure.

[0011] Preferably, in the above air guide structure, fixed ends of the air guide plates are connected with an outside of a front sidewall of the first horn structure; free ends of the air guide plates are extended toward a front sidewall of the second horn structure in a front; a shape of each of the free ends of the air guide plates is matched with that of an inside of the front sidewall of the second horn structure.

[0012] Preferably, in the above air guide structure, fixed ends of the air guide plates are connected with an inside of the front sidewall of the second horn structure; free ends of the air guide plates are extended toward an outer sidewall of the first horn structure in a rear; a shape of each of the free ends of the air guide plates is matched with that of the outer sidewall of the first horn structure.

[0013] Preferably, in the above air guide structure, the air guide plate comprises a plurality of the air guide plates provided in parallel; the plurality of the air guide plates are provided with different lengths.

[0014] Preferably, in the above air guide structure, in the plurality of the air guide plates, a length of each of the air guide plates provided on a front middle part is smaller than that of each of the air guide plates provided at front two sides.

[0015] Preferably, in the above air guide structure, the air guide structure further comprises an ascending-descending device; the ascending-descending device is configured to drive the first horn structure to move between an ascending position and a descending position; a length of the air guide plate is smaller than a distance between an outer wall of the front sidewall of the first horn structure and an inner wall of the front sidewall of the second horn structure at the descending position.

[0016] Preferably, in the above air guide structure, a shape of the upper edge of the first horn structure is matched with that of the upper edge of the second horn structure; at the descending position, the upper edge of the first horn structure covers the upper edge of the sec-

ond horn structure, thereby sealing the air delivery passage.

[0017] The present disclosure has the following beneficial effects.

1. For the air delivery passage that is obliquely extended upward and forward, the air guide plate is provided between the first wall and the second wall below the air outlet, and a height of the upper edge of the air guide plate is set to be not greater than that of the air outlet. In such a way, the user only can observe an air passage in the air outlet and cannot see the air guide plate from the outside; and the overall aesthetics is not affected due to the existence of the air guide plate.

2. For a horn-shaped air delivery passage, the air guide plate may be provided on a main air-out direction, such that the air-out guiding on the main air-out direction is implemented, and the air guide plate can be hidden simultaneously.

3. According to different shapes of the air delivery passage, the air guide plate may be provided with different lengths, thereby implementing the air-out guiding of the air guide plate on the whole air delivery passage.

4. For the horn-shaped air delivery passage that can be ascended and descended, the air guide plate is provided into a shape matched with that of the air delivery passage at the descending position, such that no interference is caused to ascending and descending actions.

Brief Description of the Drawings

[0018] Through the following description on the embodiments of the present invention with reference to accompanying drawings, the above as well as other purposes, characteristics and advantages of the present invention will become more clearly, in the drawings:

Fig. 1a is a front view of an air guide structure of the present invention;

Fig. 1b is a top view of an air guide structure of the present invention;

Fig. 1c is a side view of an air guide structure of the present invention;

Fig. 2 is a systematic diagram illustrating that an air guide structure of the present invention is mounted on a vertical air conditioning device with a top opening.

Fig. 3 is a partially enlarged systematic diagram of an A place in Fig. 2;

Fig. 4 is a exploded diagram of an air guide structure of the present invention;

Fig. 5 and Fig. 6 are systematic diagrams of mounting structures for two different air guide plates of the present invention;

Fig. 7a is a global view of an air guide structure of

the present invention when a top cover is positioned at an ascending position (air guide plates are not seen); and

Fig. 7b is a global view of the present invention when a top cover is positioned at a descending position

Detailed Description of the Embodiments

[0019] The air delivery passage may be an air delivery passage that is obliquely extended upward and forward and also may be an air delivery passage (not shown in Fig.) that is extended upward and downward; an air outlet is provided at an upper end of the air delivery passage and delivers an air to a front side; a first wall is positioned at the front side; a second wall is positioned at a rear side; an air guide plate is extended between the first wall and the second wall along a forward direction and a backward direction; and a height of an upper edge of the air guide plate is not greater than that of a lower edge of the air outlet. In such a way, when observing the air outlet, the user only can see the air outlet and cannot see the air baffle plates at the air outlet; while providing an air-out guiding function, the air baffle plates cannot be observed by the user and an overall impression of an air conditioning device is not affected.

[0020] Preferably, the present invention is applied to an air conditioning device having an oblique air outlet. As shown in Fig. 1a to Fig. 1c, an air guide structure comprises an air delivery passage 16 obliquely extended upward and forward; an upper end of the air delivery passage 16 is formed into an air outlet 15; the air delivery passage 16 comprises a first wall 17 positioned at a downward side and a second wall 122 positioned at an upward side; an air guide plate 18 is provided below the air outlet 15 and is provided between the first wall 17 and the second wall 122; the air guide plate 18 is arranged vertically and is extended along a forward direction and a backward direction; a height of an upper edge 183 of the air guide plate 18 is not greater than that of a lower edge of the air outlet 15; preferably, the height of the upper edge 183 of the air guide plate 18 is smaller than that of the lower edge of the air outlet 15, and there exists a height difference H, as shown in Fig. 1a. In such a way, when the user observes the air outlet 15, as shown in Fig. 1c, only the air outlet can be seen and the air baffle plates at the air outlet cannot be seen; while providing an air-out guiding function, the air baffle plates cannot be seen by the user, so the overall impression of the air conditioning device is not affected and the aesthetics of a product is increased. The first wall 17 and the second wall 122 may be a plane or a curved surface and may be provided in parallel or at a certain angle; the air outlet 15 is preferably and vertically fixed with the first wall 17 and/or the second wall 18, and also may be obliquely provided; the shape of the air guide plate 18 is not limited to an approximately triangular shape in Fig. 1a to Fig. 1c and also may be any shape such as a rectangular shape and other polygonal shapes; one or more air guide plates

18 may be provided and preferably are provided in parallel; distances between the air guide plates provided in parallel may be the same or different; the lengths of a plurality of the air guide plates may be the same and also may be different, and can be regulated according to a cross-section shape of the air delivery passage 16.

[0021] In a second embodiment, as shown in Fig. 2 to Fig. 7, it is a specific application of the air guide structure on the air conditioning device. Herein, a top air delivery passage 6 is corresponding to the air delivery passage 16 in the first embodiment; an air guide sleeve 22 is corresponding to the second wall 122 in the first embodiment; a decorative cover 7 is corresponding to the first wall 17 in the first embodiment; a part, positioned at a front side, of an annular air outlet 61 between the air guide sleeve 22 and the decorative cover 7 is corresponding to the air outlet 15 in the first embodiment.

[0022] In Fig. 2 to Fig. 4, the air conditioning device comprises a cylindrical air conditioning device housing 5; a main body air passage and an air generation device are provided in the air conditioning device housing 5; an air outlet structure of the air conditioning device in the embodiment comprises a top opening 9 provided on a top of the air conditioning device; the top opening 9 is obliquely provided relative to an axial direction. Specifically, a surface where an opening edge of the top opening 9 is located is not perpendicular to the axial direction of the air conditioning device housing 5, but is formed into a certain inclination angle with the axial direction of the air conditioning device housing 5; the surface where the opening edge is located is preferably but not limited to a plane, and also may be a curved surface or other types of surfaces; the air conditioning device further comprises a top cover 2; the top cover 2 is provided at the top opening 9; the top cover 2 is provided at the top opening 9 and at least partially shelters from the top opening 9. Herein, the meaning of at least partially shelters from the top opening 9 refers to that the user cannot see an overall shape of the top opening 9 when observing from an outside and only can see a part of the top opening 9. The top cover 2 comprises the air guide sleeve 22; a sidewall of the air guide sleeve 22 is a first horn structure which is hollow overall and whose outer diameter is gradually increasing from a lower end to an upper end; an inclined surface is formed by the first horn structure; a lower end of the air guide sleeve 22 is provided in the top opening 9. The top cover 2 comprises the air guide sleeve 22 and an upper cover 21; the upper cover 21 is provided at an upper end of the air guide sleeve 22; when the user observes the air conditioning device from the outside, the top opening 9 is visually and mainly covered by the upper cover 21. The upper cover 21 and the air guide sleeve 22 are connected together and formed into a whole structure, and also may be separately manufactured and then are connected into a whole structure via a connection piece.

[0023] The top opening 9 comprises a first edge 91 located at a front side and provided at a lowest position,

and a second edge 92 located at a rear side and provided at a highest position. As the top opening 9 is obliquely provided, in order to coordinate with the shape of the top opening 9, an upper end 224 of the air guide cover is also obliquely arranged towards a same direction with the top opening 9. As a whole, the upper end 224 of the air guide cover is basically parallel to the top opening 9. In order to match with the inclined top opening 9, the air guide cover 22 comprises a front sidewall 222 at a front side and a rear sidewall 223 at a rear side; the front sidewall 222 and the rear sidewall 223 both are bent towards a radial outside from the lower end to an upper end, and preferably are extended in the forward and backward directions; on a cross section overlapped to an axial line, a curvature of the front sidewall 222 is greater than that of the rear sidewall 223. Herein, the front sidewall 222 is provided near the first edge 91 of the top opening 9. On the whole, the air guide cover 22 is of the first horn structure bent towards the first edge 91 of the top opening 9 and inclined at the upper end 224, as shown in Fig. 3. Preferably, when the upper cover 21 is mounted at the upper end 224 of the air guide cover 22, the upper cover 21 is also obliquely arranged and is provided with an oblique shape same as the top opening 9. In this way, by observing from the outside, the upper cover 21 is positioned above the top opening 9 and is inclined in the same direction with the top opening 9; the upper cover 21 is basically parallel to the top opening 9.

[0024] The decorative cover 7 is of a tubular shape with upper and lower ends opened, and is a second horn structure which is hollow overall and whose outer diameter is gradually increasing from a lower end to an upper end. The shape of the second horn structure may be consistent with that of the first horn structure of the air guide cover 22, and also may be not consistent with that of the first horn structure. As shown in Fig. 4, the shape of the second horn structure is not consistent with that of the first horn structure. An upper edge 71 of the decorative cover 7 is provided with a first edge 711 located at a front side and positioned at a lowest position, and a second edge 712 located at a rear side and positioned at a highest position. The decorative cover 7 is provided in the air conditioning device housing 5 at the top opening 9 and is positioned in a radial outside of the air guide cover 22; the decorative cover 7 is provided at an outer circumference of the air guide cover 22 in a sleeving manner from a lower end. The decorative cover 7 may be fixed on an inner wall of the air conditioning device housing 5 at the top opening 9. Preferably, the top opening 9 of the air conditioning device is formed by the air conditioning device housing 5 by surrounding; the shape of the upper edge 71 of the decorative cover 7 is matched with that of the top opening 9; when the decorative cover 7 is mounted in the air conditioning device housing 5, the decorative cover 7 keeps out the inner wall of the air conditioning device housing 5 overall; when the user observes from the top, only the decorative cover 7 can be observed and the inner wall of the air conditioning device

housing 5 cannot be observed; and thus, the decorative cover 7 takes the decorative effect to the top opening 9.

[0025] The top air delivery passage 6 is formed between an inner sidewall of the decorative cover 7 and an outer sidewall of the air guide cover 22. As the decorative cover 7 and the air guide cover 22 both are of a smooth horn structure, the top air delivery passage 6 formed there between, on the whole, also is of a horn shape extended smoothly along a radial outside from a lower end to an upper end. As a result, the air-out resistance can be reduced, the air-out speed is improved, and the smooth air delivery of the air conditioning device to a peripheral direction may be implemented. An upper end of the top air delivery passage 6 is formed into the annular air outlet 61, as shown in Fig. 7a; the upper edge 224 of the air guide cover 22 and the upper edge 71 of the decorative cover 7 are respectively formed into a lower edge and an upper edge of the annular air outlet 61. A mounting seat air opening 11 communicated with the main body air passage is provided between the decorative cover 7 and the air guide cover 22.

[0026] When a vertical air conditioning device is placed into a room, it is generally placed against a wall, and particularly, is placed at a corner of the wall. In this case, the user always hopes that the air volume blown to the room can be larger. To this end, as shown in Fig. 7, in actual use of the air conditioning device in the embodiment, the rear side of the device faces to the wall, the front side of the device faces to a space of the room and the top opening 9 is inclined toward the space of the room. The mounting seat air opening 11 is opposite to the front sidewall 222 of the air guide cover 22. In this way, a great part of the air volume from the mounting seat air opening 11 will be guided by the front sidewall 222 and then is blown out from a vicinity of the first edge 91 of the top opening to the room space at the front side of the air conditioning device, and the rest air volume will be blown out to the periphery of the air conditioning device via a rest part of the top air delivery passage 6. In such a way, the proportion of the air volume blown to the room space may be improved, and the heat exchange effect of the room space is effectively improved.

[0027] When the air from the main body air passage is blown to the front sidewall 222 of the air guide cover 22 via the mounting seat air opening 11, due to different mounting positions and types of the air generation device, an air-out direction of the main body air passage is not necessarily along a vertical direction. In some cases, the air-out direction of the main body air passage is oblique relative to a axial direction; at this moment, after the air is guided by the front sidewall 222 of the air guide cover 22, the main air volume is not blown out along a direction directly facing a front side of the air conditioning device and is deviated to some extent from the direction facing the front side of the air conditioning device, such that a heat exchange effect and a user experience of the room will be affected. Hence, it is necessary to correct the air-out direction of the front side. In light of this, as

shown in Fig. 4 to Fig. 7, a part, positioned at the front side, of the top air delivery passage 6 is provided with an air guide structure in the first embodiment. Specifically, the air guide plate 8 is arranged vertically and is extended along a forward direction and a backward direction; the air guide plate 8 is provided near the first edge 711 of the decorative cover 7; a height of an upper edge 83 of the air guide plate 8 is not greater than that of the first edge 711 of the decorative cover 7. The air guide plate is provided in the top air delivery passage 6, may be mounted on the decorative cover 7 and also may be mounted on the air guide cover 22. As a preferable solution, as shown in Fig. 5, the air guide plates 811, 812 are provided on an inner wall of the front sidewall 72 of the decorative cover 7; the air guide plates 811, 812 are vertically arranged; one ends of the air guide plates 811, 812 are connected to the inner wall of the front sidewall 72 of the decorative cover 7, and the other ends of the air guide plates 811, 812 are extended backward to the front sidewall 222 of the air guide cover; the air guide plate 8 comprises a plurality of the air guide plates, and the air guide plates are provided in parallel. As shown in Fig. 5, five air guide plates are provided; the air guide plate 8 may be provided with different lengths. As shown in Fig. 5, three short air guide plates 811 are provided on a middle part, and two long air guide plates 812 are provided at two sides of the three short air guide plates 811. As another preferable solution, as shown in Fig. 6, the air guide plates 821 and 822 are provided on an outer wall, positioned on the front sidewall 222, of the air guide cover 22; the air guide plates 821, 822 are vertically provided; one ends of the air guide plates 821, 822 are connected to the outer wall of the front sidewall 222 of the air guide cover 22, and the other ends of the air guide plates 821, 822 are extended forward to the front sidewall 72 of the decorative cover 7. The air guide plates may be provided with different lengths. As shown in Fig. 6, the three short air guide plates 821 are provided in the middle part and the two long air guide plates 822 are provided at the two sides of the three short air guide plates 821. The air guide plates are set into the different lengths, which is intended to arrange the mounting seat air opening 11 at the front side of a mounting seat and between the decorative cover 7 and the air guide cover 22 as shown in Fig. 3 and Fig. 4; the lower ends of the decorative cover 7 and the air guide cover 22 are not coaxially arranged. The axial line of the air guide cover 22 in the decorative cover 7 is provided more close to the rear side. Hence, a distance W1 between the decorative cover 7 and the air guide cover 22 positioned at the two sides of the front side is greater than a distance W2 between the decorative cover 7 and the air guide cover 22 positioned in the middle of the front side. Referring to Fig. 3, the air guide plates 812, 822 positioned in the parts at the two sides of the front side have a greater length than the air guide plates 811, 821 positioned in the middle of the front side, such that the air-out direction at the front side of the whole top air delivery passage 6 can be reg-

ulated by the air guide plates, and thus the air at the front side can be blown out to the direction directly facing the front side, as shown by arrows in Fig. 5 and Fig. 6.

[0028] The height of the upper edge 83 of the air guide plate 8 is not greater than that of the first edge 711 of the decorative cover 7, as shown in Fig. 3. In this way, by observing from the outside, the air guide plate is not exposed out of the decorative cover 7 and are hidden by the air conditioning device housing 5 and the decorative cover 7, such that the user cannot see any blade or grid structure from the outside, the whole aesthetics is better, and simultaneously, the air further can be guaranteed to be blown to the direction directly facing the front side.

[0029] As a preferable implementation manner, the top cover 2 may be made into an ascending-descending structure. Referring to Fig. 7a and Fig. 7b, the top cover is moved between an ascending position and a descending position. Through the ascending and descending movements of the top cover 2, the distance with the top opening 9 is changed and the opening degree of the top air delivery passage 6 is further changed, thereby regulating the air volume of the blown air. As a preferable manner, the top cover 2 may seal the top opening 9 at the descending position, thereby closing the top air delivery passage 6, specifically: in a use state, the top cover 2 is moved upward to the ascending position such that the top air delivery passage 6 is exposed and delivers the air to the room to exchange the heat; in a closed state, the top cover 2 may be descended to the descending position; the top cover 2 is provided with a shape matched with the top opening 9, so at the descending position, the top opening 9 may be completely sealed by the top cover 2; in this way, the top air delivery passage 6 is closed completely and no longer blows the air; and meanwhile, on the whole, the air conditioning device is of a cylindrical structure whose appearance has no opening overall and top is tilted, so any air outlet cannot be seen from the appearance and the high-class sense of the product is improved. In the closed state, the top cover 2 seals the top opening 9, such that foreign matters such as dust or liquid can be prevented from entering the air conditioning device when it is not in use, and the possibility of the foreign matters to cause the failure of the air conditioning device is reduced; and furthermore, the inside of the air conditioning device also can be kept clean and the maintainability is better.

[0030] In order to coordinate with the top cover 2 to seal the top opening 9, preferably, the shape of the upper edge 224 of the air guide cover 22 is matched with that of the upper edge of the decorative cover 7; at the descending position of the top cover 2, the upper edge 224 of the air guide cover 22 covers the upper edge of the decorative cover 7, thereby sealing the air delivery passage. In order to enable the air guide plates not to affect the ascending and descending of the air guide cover 22 relative to the decorative cover 7, preferably, the lengths of the air guide plates 8 are provided to be smaller than a distance between the outer wall of the front sidewall

222 of the air guide cover 22 at the descending position and the inner wall of the front sidewall 72 of the decorative cover 7.

[0031] The top cover 2 may be ascended and descended by means of a top cover ascending-descending device; the top cover ascending-descending device comprises a drive unit 3; the drive unit 3 preferably is a gear-rack ascending-descending mechanism or a nut-rod ascending-descending mechanism.

[0032] In addition, it should be understood by those of ordinary skill in the art that, the accompanying drawings provided here are intended to explain and are not necessarily drawn proportionally.

[0033] Meanwhile, it should be understood that, example embodiments are provided so that this disclosure will be thorough, and will fully convey the scope to those who are skilled in the art. Numerous specific details are set forth such as examples of specific components, devices, and methods, to provide a thorough understanding of embodiments of the present disclosure. It will be apparent to those skilled in the art that specific details need not be employed, that example embodiments may be embodied in many different forms and that neither should be construed to limit the scope of the disclosure. In some example embodiments, well-known processes, well-known device structures, and well-known technologies are not described in detail.

[0034] When an element or layer is referred to as being "on," "engaged to," "connected to," or "coupled to" another element or layer, it may be directly on, engaged, connected or coupled to the other element or layer, or intervening elements or layers may be present. In contrast, when an element is referred to as being "directly on," "directly engaged to," "directly connected to," or "directly coupled to" another element or layer, there may be no intervening elements or layers present. Other words used to describe the relationship between elements should be interpreted in a like fashion (e.g., "between" versus "directly between," "adjacent" versus "directly adjacent," etc.). As used herein, the term "and/or" includes any and all combinations of one or more of the associated listed items.

[0035] Although the terms first, second, third, etc. may be used herein to describe various elements, components, regions, layers and/or sections, these elements, components, regions, layers and/or sections should not be limited by these terms. These terms may be only used to distinguish one element, component, region, layer or section from another region, layer or section. Terms such as "first," "second," and other numerical terms when used herein do not imply a sequence or order unless clearly indicated by the context. Thus, a first element, component, region, layer or section discussed below could be termed a second element, component, region, layer or section without departing from the teachings of the example embodiments. In addition, in the description of the present disclosure, unless otherwise specified, "a plurality of" means two or more.

[0036] Terms such as "inner," "outer," "beneath," "below," "lower," "above," "upper," and the like may be used herein for ease of description to describe one element or feature's relationship to another element(s) or feature(s) as illustrated in the figures. Spatially relative terms may be intended to encompass different orientations of the device in use or operation in addition to the orientation depicted in the figures. For example, if the device in the figures is turned over, elements described as "below" or "beneath" other elements or features would then be oriented "above" the other elements or features. Thus, the example term "below" can encompass both an orientation of above and below. The device may be otherwise oriented (rotated 90 degrees or at other orientations) and the spatially relative descriptors used herein interpreted accordingly.

[0037] The above are only preferred embodiments of the present disclosure and are not intended to limit the present disclosure. Those skilled in the art may make various changes and modification to the present disclosure. Any change, equivalent substitution, improvement or the like obtained without departing from the spirit and principles of the present disclosure should all fall in the scope of protection of the present disclosure.

Claims

1. An air guide structure, wherein comprising: an air delivery passage, wherein an end part of the air delivery passage is formed into an air outlet; the air delivery passage comprises a first wall and a second wall that are provided oppositely; an air guide plate is provided below the air outlet and is positioned between the first wall and the second wall; the air guide plate is extended along a forward direction and a backward direction; a height of an upper edge of the air guide plate is not greater than a height of a lower edge of the air outlet.
2. The air guide structure as claimed in claim 1, wherein the air delivery passage is obliquely extended upward and forward; the first wall is provided at a lower side, and the second wall is provided at an upper side.
3. The air guide structure as claimed in claim 2, wherein the first wall is formed by a first horn structure (22) which is hollow overall and whose outer diameter is gradually increasing from a lower end to an upper end; the second wall is formed by a second horn structure (7) which is hollow overall and whose outer diameter is gradually increasing from a lower end to an upper end; the second horn structure (7) is provided at a periphery of the first horn structure (22) from below in a sleeving manner; an upper edge (224) of the first horn structure and an upper edge (71) of the second horn structure are respectively

formed into the lower edge and an upper edge of the air outlet; the air guide plate is provided on a radial outer sidewall at a front side of the first horn structure and/or on a radial inner sidewall at a front side of the second horn structure.

4. The air guide structure as claimed in claim 3, wherein the upper edge (224) of the first horn structure (22) and the upper edge (71) of the second horn structure (7) are obliquely provided in a same direction relative to a horizontal direction.
5. The air guide structure as claimed in claim 4, wherein the second horn structure (7) comprises a first edge (711) located at a front side and provided at a lowest position, and a second edge (712) located at a rear side and provided at a highest position; the air guide plates (8) is provided near the first edge (711) of the second horn structure (7); the height of the upper edge (83) of the air guide plate is not greater than that of the first edge (711) of the second horn structure (7).
6. The air guide structure as claimed in claim 4, wherein fixed ends of the air guide plates (821, 822) are connected with an outside of a front sidewall (222) of the first horn structure (22); free ends of the air guide plates (821, 822) are extended toward a front sidewall (72) of the second horn structure (7) in a front; a shape of each of the free ends of the air guide plates (821, 822) is matched with that of an inside of the front sidewall (72) of the second horn structure (7).
7. The air guide structure as claimed in claim 4, wherein fixed ends of the air guide plates (811, 812) are connected with an inside of the front sidewall (72) of the second horn structure (7); free ends of the air guide plates (811, 812) are extended toward an outer sidewall (222) of the first horn structure (22) in a rear; a shape of each of the free ends of the air guide plates (811, 812) is matched with that of an outer sidewall (222) of the first horn structure (22).
8. The air guide structure as claimed in any one of claims 3-7, wherein the air guide plate (8) comprises a plurality of the air guide plates (811, 812, 821, 822) provided in parallel; the plurality of the air guide plates (811, 812, 821, 822) are provided with different lengths.
9. The air guide structure as claimed in claim 8, wherein in the plurality of the air guide plates, a length of each of the air guide plates (811, 821) provided on a front middle part is smaller than that of each of the air guide plates (812, 822) provided at front two sides.
10. The air guide structure as claimed in any one of

claims 3-7, wherein further comprises an ascending-descending device; the ascending-descending device is configured to drive the first horn structure (2) to move between an ascending position and a descending position; a length of the air guide plate is smaller than a distance between an outer wall of a front sidewall (222) of the first horn structure (22) and an inner wall of a front sidewall (72) of the second horn structure (7) at the descending position.

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11. The air guide structure as claimed in claim 10, wherein a shape of the upper edge (224) of the first horn structure (22) is matched with that of the upper edge (71) of the second horn structure (7); at the descending position, the upper edge (224) of the first horn structure (22) covers the upper edge (71) of the second horn structure (7), thereby sealing the air delivery passage.

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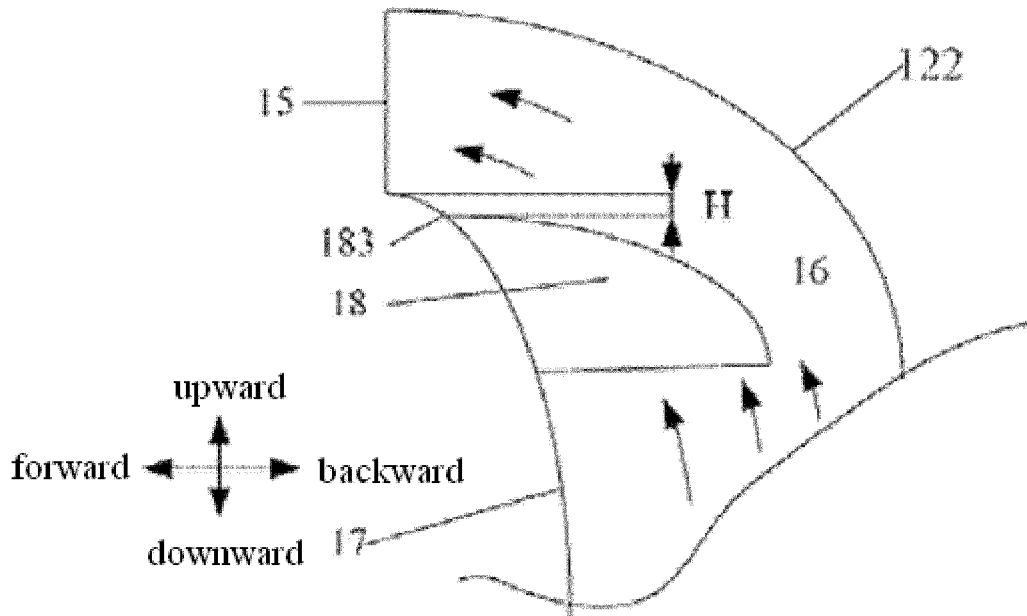


Fig. 1a

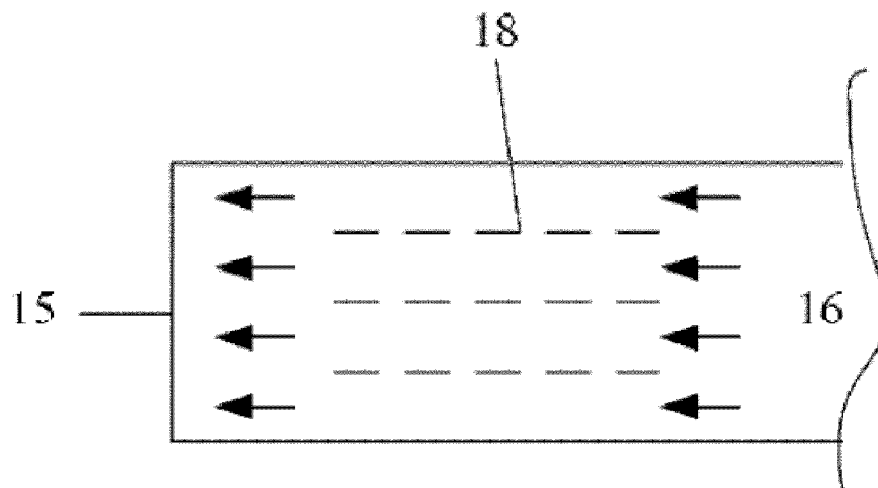


Fig. 1b

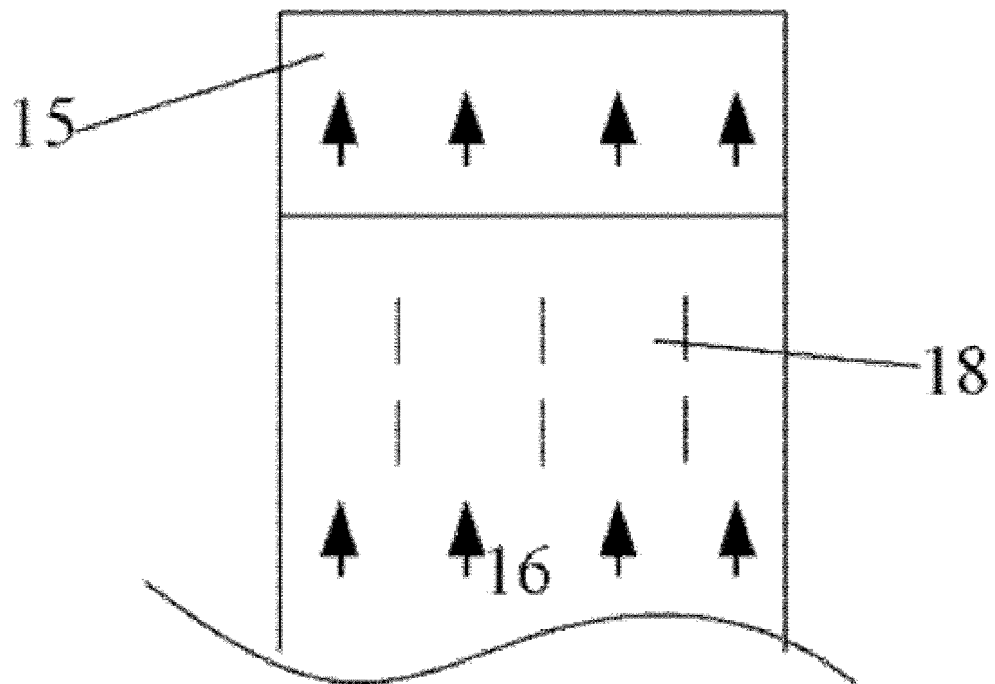


Fig. 1c

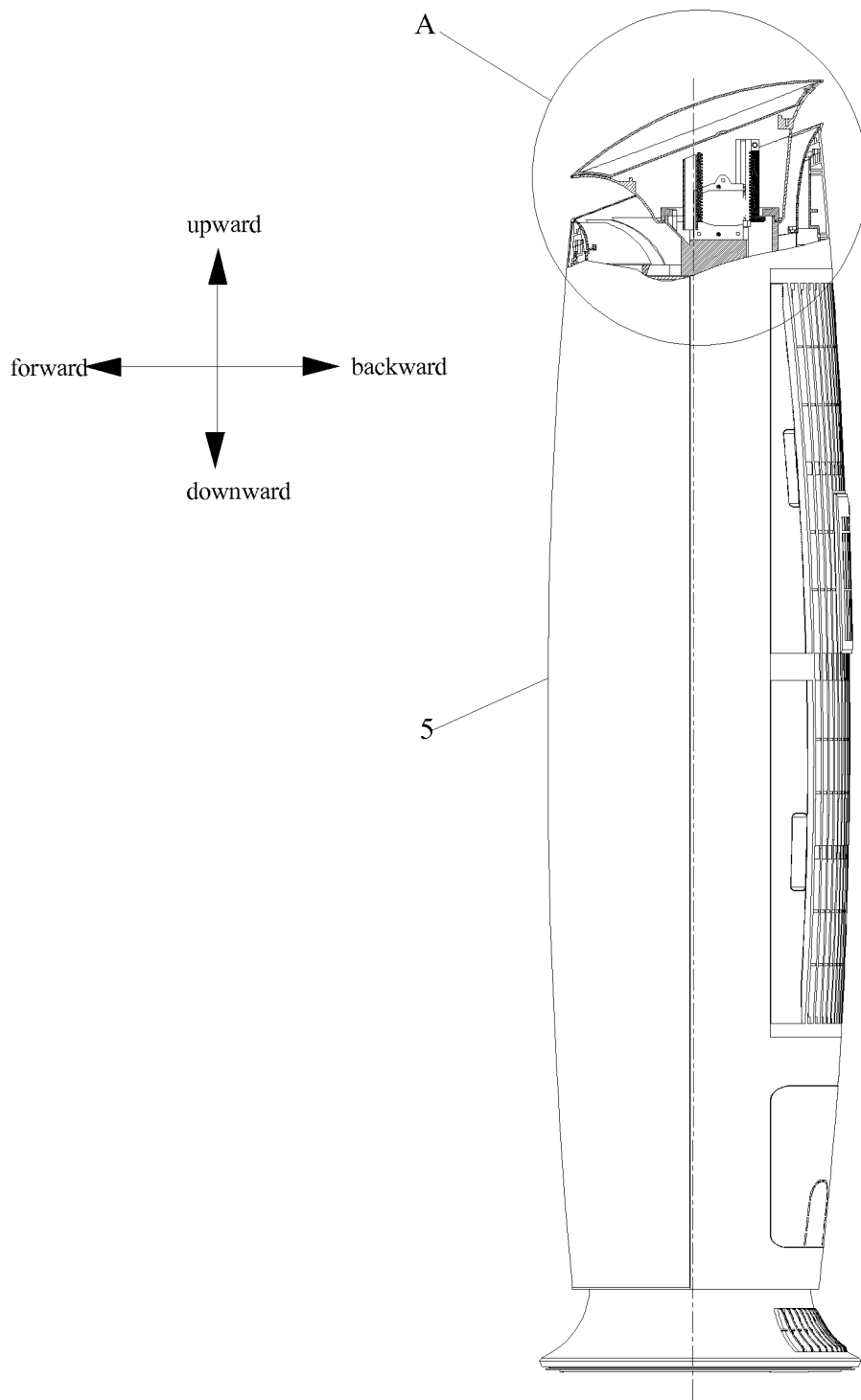


Fig. 2

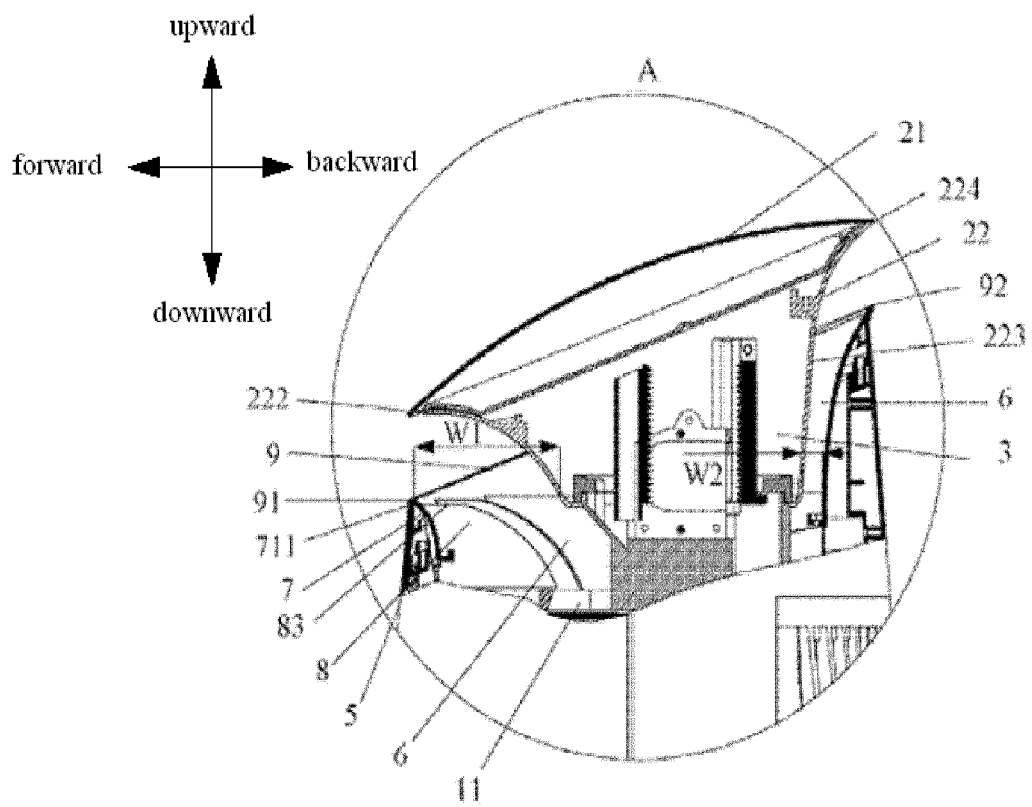


Fig. 3

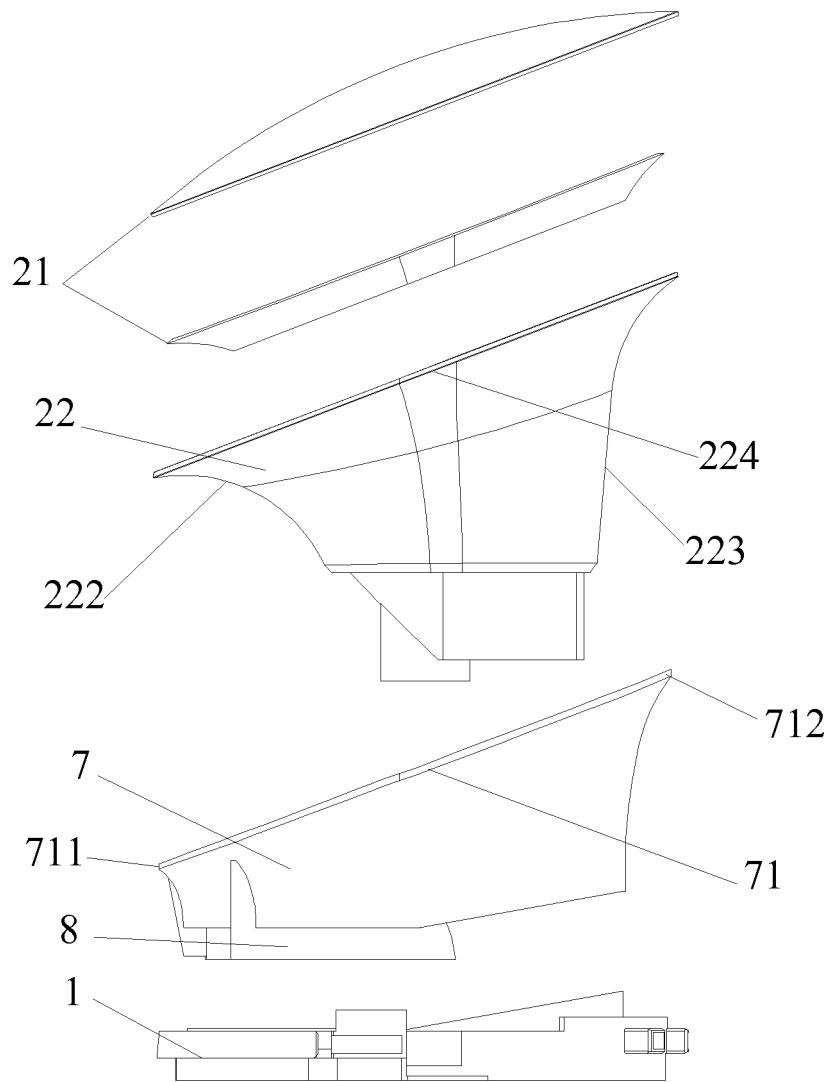


Fig. 4

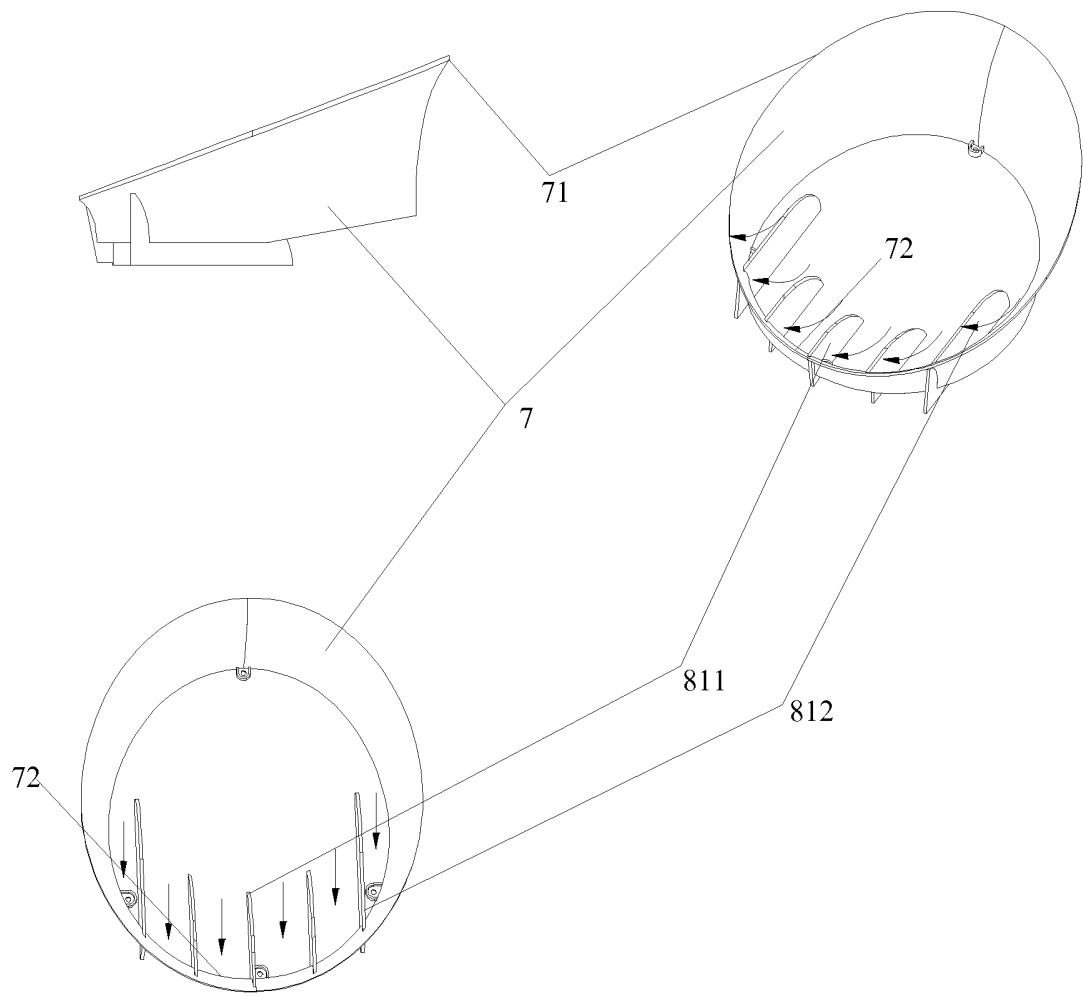


Fig. 5

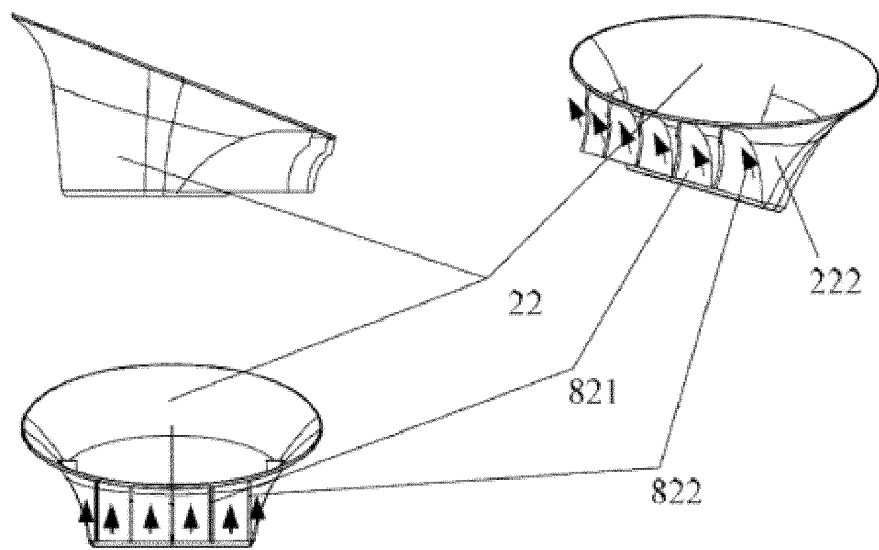


Fig. 6

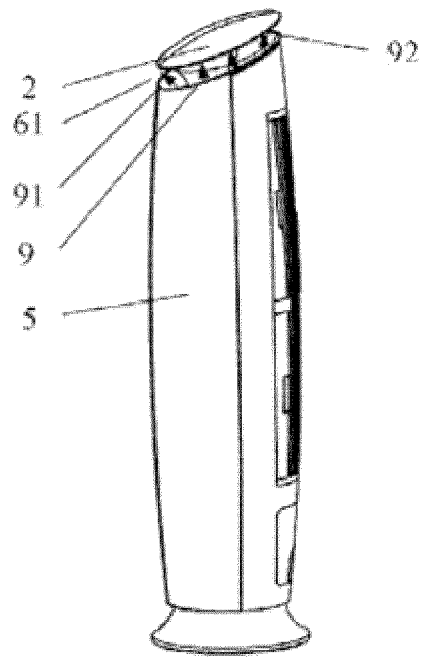


Fig. 7a

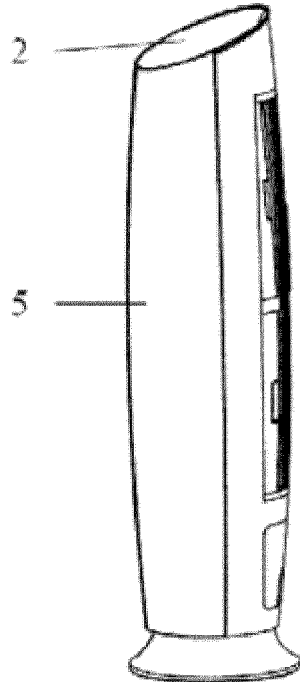


Fig. 7b

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2016/098210

A. CLASSIFICATION OF SUBJECT MATTER

F24F 3/08 (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)

F24F

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)
EPODOC, WPI, CNPAT, CNKI: wind guide, loudspeaker; wind, guide, passage, wall, height, length, bell-mouthed, aesthetic

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 105115068 A (GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI), 02 December 2015 (02.12.2015), claims 1-11	1-11
PX	CN 205048601 U (GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI), 24 February 2016 (24.02.2016), claims 1-11	1-11
A	CN 201100712 Y (GUANGDONG GALANZ ENTERPRISES CO., LTD.), 13 August 2008 (13.08.2008), description, page 2, line 22 to page 3, line 1, and figures 1-5	1-11
A	CN 101153741 B (TOYODA GOSEI CO., LTD.), 31 August 2011 (31.08.2011), description, paragraphs [0029]-[0114], and figures 1-14	1-11
A	JP H05180473 A (HITACHI LTD. et al.), 23 July 1993 (23.07.1993), the whole document	1-11

☐ Further documents are listed in the continuation of Box C.
 ☒ See patent family annex.

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"E" earlier application or patent but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	"&" document member of the same patent family

Date of the actual completion of the international search 03 December 2016 (03.12.2016)	Date of mailing of the international search report 12 December 2016 (12.12.2016)
Name and mailing address of the ISA/CN: State Intellectual Property Office of the P. R. China No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088, China Facsimile No.: (86-10) 62019451	Authorized officer WANG, Ying Telephone No.: (86-10) 62084886

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2016/098210

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CN 105115068 A	02 December 2015	None	
CN 205048601 U	24 February 2016	None	
CN 201100712 Y	13 August 2008	None	
CN 101153741 B	31 August 2011	JP 2008087514 A	17 April 2008
		US 7887400 B2	15 February 2011
		US 2008081550 A1	03 April 2008
		JP 4816381 B2	16 November 2011
		CN 101153741 A	02 April 2008
JP H05180473 A	23 July 1993	None	

Form PCT/ISA/210 (patent family annex) (July 2009)

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- CN 201510577920 [0001]