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(54) **ATTACHMENT AND DRYING ASSEMBLY**

(57) The disclosure discloses an accessory (10) and a drying assembly (100), wherein the accessory (10) comprises a mounting portion (11) and an airflow portion (12), the mounting portion (11) is configured to be attached to the drying apparatus (20), and the airflow portion (12) comprises an air inlet, a guide chamber (121), and an air outlet. The airflow portion (12) is an integral molding structure, and comprises: a single-layer sidewall (122) at the air outlet along a radial direction, a multi-layer sidewall (123) at least in other parts along a radial direction, and a thermal insulation chamber (124) between layers of the multi-layer sidewall.

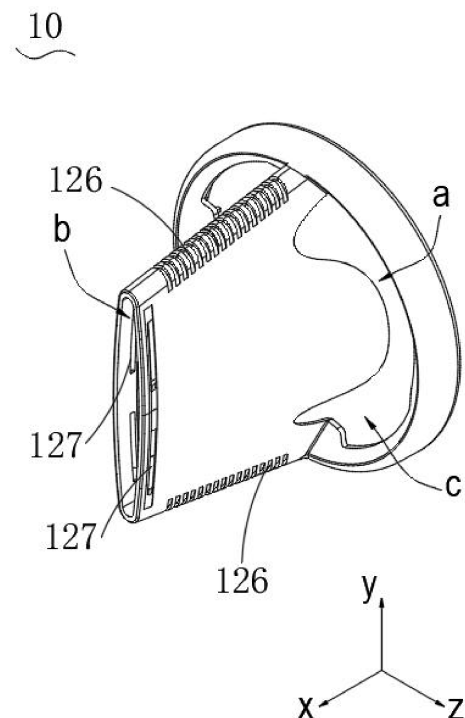


FIG. 2

Description

FIELD OF THE INVENTION

[0001] The present disclosure relates to the field of drying apparatus, in particular to an accessory and a drying assembly.

BACKGROUND OF THE INVENTION

[0002] When a nozzle is attached to a hair dryer, it is able to alter an output airflow to provide more drying capabilities. When the hair dryer is emitting high-temperature airflow, the nozzle will be heated by the high-temperature airflow passing through. There is a risk of burns when the user touches the surface of the nozzle.

[0003] In the prior art, in order to avoid overheating of the nozzle, the nozzle is configured with a multi-layer housing, so as to avoid the outer wall being directly heated by the airflow. However, it is necessary to design a relevant coupling structure to couple the multi-layer nozzle, which not only increases production costs, but also causes heat transfer to occur at the coupling location, increasing the temperature of the shell, which makes it difficult to meet the design needs of the nozzle.

SUMMARY OF THE INVENTION

[0004] The present disclosure provides an accessory and a drying assembly, which is designed to solve the problem that it is difficult for a nozzle to balance low cost with good thermal insulation capability in the prior art.

[0005] The present disclosure discloses an accessory and a drying assembly, wherein the accessory comprises a mounting portion and an airflow portion, and the mounting portion is configured to be attached to a drying apparatus; the airflow portion comprises an air inlet, a guide chamber, and an air outlet. The airflow portion is an integral molding structure and comprises: a single-layer sidewall at the air outlet along a radial direction; a multi-layer sidewall in at least other parts along a radial direction, and; a thermal insulation chamber between layers of the multi-layer sidewall.

[0006] The accessory in the present disclosure comprises an airflow portion with a single-layer sidewall at the air outlet and a multi-layer sidewall in at least other parts by means of one-piece molding. This creates a thermal insulation chamber to avoid burns to the user without additional coupling structures, thus achieving a balance between low cost and better thermal insulation capability. In addition, the single-layer sidewall minimizes the wall thickness and overall size of the air outlet, improving ease of use for the user.

[0007] The present disclosure also provides a drying assembly, comprising a drying apparatus and the accessory described above.

[0008] Additional aspects and advantages of embodiments of the present disclosure will be given, in part, in the following detailed description, part of which will become apparent from the following detailed description or will be learned through the implementation of the present disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The foregoing and/or additional aspects and advantages of the present disclosure will become apparent and readily understood from the detailed description of the embodiments in conjunction with the following accompanying drawings, wherein:

FIG. 1a and **FIG. 1b** are schematic diagrams of a drying assembly in some embodiments of the present disclosure;

FIG. 2 is a schematic diagram of a three-dimensional structure of an accessory in some embodiments of the present disclosure;

FIG. 3 is a schematic diagram of a three-dimensional structure from another perspective of an accessory in some embodiments of the present disclosure;

FIG. 4 is a schematic diagram of a portion configured along a first direction of the accessory in some embodiments of the present disclosure;

FIG. 5 is a schematic diagram of a portion configured along a second direction of the accessory in some embodiments of the present disclosure;

FIG. 6 is a schematic cross-sectional diagram of an accessory in some embodiments of the present disclosure;

FIG. 7 is a schematic diagram of a cover of the accessory in some embodiments of the present disclosure;

FIG. 8 is a schematic diagram of a drying apparatus in some embodiments of the present disclosure.

DETAILED DESCRIPTION OF THE INVENTION

[0010] The embodiments of the present disclosure are described in detail below, and examples of said embodiments are shown in the drawings wherein the same or similar designations denote the same or similar elements or elements having the same or similar functions throughout. The embodiments described below by reference to the drawings are illustrative and are intended to explain the embodiment of the present disclosure only and should not be construed as a limitation on the embodiment of the present disclosure.

[0011] In the description of this disclosure, it is necessary to understand that the terms "center", "longitudinal", "horizontal", "length", "width", "thickness", "up", "down", "front", "back", "left", "right", "vertical", "horizontal", "top", "bottom", "inner", "outside", "clockwise",

"counterclockwise", the orientation or positional relationship so indicated is based on the orientation or positional relationship shown in the drawings, only for the convenience of describing the present disclosure and simplifying the description, and does not indicate or imply that the apparatus or element referred to must have such specific orientation, be constructed and operated in such particular orientations, and therefore cannot be construed as a limitation on the present disclosure. In the description of this disclosure, "plurality" means two or more than two, unless otherwise expressly and specifically qualified.

[0012] In the description of the present disclosure, it is noted that, unless otherwise expressly specified or qualified, the terms "mounted", "connected", "coupled" are to be understood broadly, for example, they may be fixed, detachable, or integrally connected. It may be mechanically or electrically connected. It may be directly connected or indirectly connected through an intermediate medium, it may be the internal connection of two elements or the interaction relationship between two elements. For those of ordinary skill in the art, the specific meaning of the above terms in the present disclosure may be understood on a case-by-case basis.

[0013] In the present disclosure, unless otherwise expressly specified and qualified, the first feature "above" or "below" the second feature may include direct contact between the first and second features, or the first and second features are not in direct contact but through additional feature contact between them. Moreover, the first feature is "above", "above", and "above" the second feature includes the first feature directly above and obliquely above the second feature, or simply indicates that the first feature is horizontally higher than the second feature. The first feature is "below", "below", and "below" the second feature, including the first feature directly below and diagonally below the second feature, or simply indicating that the height of the first feature is less than that of the second feature.

[0014] The publication of this disclosure provides a number of different embodiments or examples to implement the different structures of the present disclosure. In order to simplify the disclosure of the present disclosure, the parts and settings for specific examples are described in this disclosure. They are only examples and are not intended to limit the present disclosure. In addition, the present disclosure may repeat the reference numbers and/or reference letters in different examples, and this repetition is for the purpose of simplification and clarity and does not in itself indicate the relationship between the various embodiments and/or settings in question. In addition, the present disclosure provides examples of various specific processes and materials, but those of ordinary skill in the art may be aware of other processes and/or the use of other materials that may be applied in the present disclosure.

[0015] As shown in **FIG. 1a** and **FIG. 1b**, an accessory 10 attached to the drying apparatus 20 is provided

in some embodiments of the present disclosure. An end of the drying apparatus 20 is configured with an air outlet element 22 from which an airflow is emitted at a normal or higher temperature during operation. The airflow passes through a preset airflow channel and reaches a target for drying. In some drawings of the present disclosure, a dashed arrow indicates part of the airflow channel, the details of which will not be elaborated below.

[0016] After the accessory 10 is attached to the drying apparatus 20, the airflow of the drying apparatus 20 may be altered. Specifically, the accessory 10 may change at least one airflow parameter of the output airflow of the drying apparatus 20, which comprises airflow speed, airflow direction, airflow shape, airflow channel, divergence or convergence degree, etc. Taking the process of hair drying with the drying apparatus 20 as an example, different airflows may serve different purposes. For example, during hair drying, a flat high-temperature airflow may be suitable for styling hair; a low-speed diffusing airflow may make the hair fluffy; and a high-speed converging airflow may make the hair straight and supple.

[0017] As shown in **FIG. 2** and **FIG. 3**, the accessory 10 comprises a mounting portion 11 and an airflow portion 12. The mounting portion 11 is configured to be attached to the drying apparatus 20, so that the accessory 10 and the drying apparatus 20 may be mutually coupled. The mounting portion 11 may at least provide sufficient attaching strength and positioning accuracy, so that the accessory 10 may remain stable with the drying apparatus 20 during operation. In some embodiments, the accessory 10 may rotate at any angle along an axial direction while being attached to the drying apparatus 20. The mounting portion 11 may be attached to the drying apparatus 20 by magnetic attraction, threads, annular buckles, etc. Its specific structure will not be discussed in the present disclosure. Unless otherwise specified below, the accessory 10 and the drying apparatus 20 are in a state of mutual attachment. The other parts of the accessory 10 and the mounting portion 11 form an attaching or coupling relationship, which means that these parts may be positioned in a preset orientation relative to the drying apparatus 20.

[0018] The airflow portion 12 comprises an air inlet a, a guide chamber 121 and an air outlet b. The air inlet a is positioned corresponding to that of the air outlet element 22 of the drying apparatus 20. The output airflow from the drying apparatus 20 enters the airflow portion 12 from the air inlet a, passes through the guide chamber 121, and finally reaches a target after leaving the accessory 10 from the air outlet b. The shape and size of the guide chamber 121 and the air outlet b may affect the airflow parameters.

[0019] When the drying apparatus 20 emits a hot airflow, the hot airflow may exchange heat with the accessory 10, heating each portion of the airflow channel. In

the embodiment of the figures, the air inlet a, the guide chamber 121, and the air outlet b may be directly heated by hot airflow. When they are heated, they will transfer heat to areas with lower temperatures, causing other areas of the accessory 10 that are not in direct contact with the hot airflow to be heated as well. The accessory 10 itself may be made of materials with low thermal conductivity, such as plastics, resins, plexi-glass, etc. The heat transfer rate inside the material is positively correlated with the cross-sectional area/contact area. For a wall-like structure, the heat transfer rate is larger in the thickness direction and smaller in the length/width direction. The heat transfer pathway to be described below mainly refers to the thickness direction along the wall.

[0020] As shown in **FIG. 4**, the airflow portion 12 may be an integral structure, and have different structures in different parts. Specifically, at the air outlet b, the airflow portion 12 comprises a single-layer sidewall 122 along a radial direction; and in at least other parts, the airflow portion 12 comprises a multi-layer sidewall 123 along a radial direction. In the multi-layer sidewall 123, adjacent layers are spaced, forming a thermal insulation chamber 124.

[0021] The single-layer sidewall 122 refers to a part of the accessory 10 where the single-layer sidewall 122 is configured. An inner surface of the single-layer sidewall 122 constitutes an inner surface of the accessory 10, which is a partial wall of the guide chamber 121. An outer surface of the single-layer sidewall 122 constitutes an outer surface of the accessory 10. When the hot airflow passes through the guide chamber 121, the heat may be transferred directly from the guide chamber 121 to the outer surface of the accessory 10 along the single-layer sidewall 122.

[0022] The multi-layered sidewall 123 refers to a part of the accessory 10 where the multi-layered sidewall 123 is configured. An inner surface and an outer surface of the accessory 10 are formed by different sidewalls. There is no surface contact between adjacent sidewall layers which are separated by the thermal insulation chamber 124. In other words, there is no heat transfer pathway along a thickness direction between the layers of the multi-layer sidewall 123. When the hot airflow passes through the guide chamber 121, the heat is first transferred to the innermost layer of the multi-layer sidewall 123, which will heat the air in the adjacent thermal insulation chamber 124. The heat will then be transferred to the other adjacent sidewall layers, and so on until it is transferred to the outermost sidewall layer which constitutes an outer surface of the accessory 10. Due to the low thermal conductivity of the airflow itself, the heat transfer rate between layers of the multi-layered sidewalls 123 is reduced. Therefore, in the part of the accessory 10 where the multi-layer sidewall 123 is configured, the temperature of the outer surface is significantly lower than that of the inner surface.

[0023] In order to maintain a stable relative position relationship between each layer of the multi-layer sidewall 123, each layer needs to be fixed. In the embodiment of the present disclosure, the entire airflow portion 12 may be formed in an integral molding structure, and the multi-layer sidewall 123 is fixed by its own material. Integrated molding is a process in which multiple parts or components are manufactured as a whole in one step. Complex parts may be manufactured as a whole, and individual structures are coupled to each other through their own materials, without the need to combine multiple parts. Specifically, 3D printing, injection molding, die-casting, CNC machining and other processes may be used to implement integral molding. The parts manufactured by integral molding do not need to be fixed with each other through coupling structure, so they have the advantages of high overall strength and high compactness.

[0024] Specifically, as shown in **FIG. 4**, along the airflow direction x, the multi-layer sidewall 123 of the airflow portion 12 transitions and merges into a single-layer sidewall 122 at the air outlet b. From a mechanical structure perspective, it may also be understood that layers of the multi-layer sidewall 123 which are not coupled to each other are coupled to the single-layer sidewall 122 at the same time. Therefore, the single-layer sidewall 122 itself constitutes a part that couples and fixes the layers of the multi-layer sidewall 123 with each other, so that the accessory 10 may comprise a multi-layer sidewall 123 without the need for fixation with another coupling structure. There is no heat transfer between the layers of the multi-layer sidewall 123 through the relevant coupling structure.

[0025] Since the hot airflow emitted by the drying apparatus 20 will diffuse, its temperature may gradually decrease as the flow distance increases. Therefore, the closer the distance between the accessory 10 and the drying apparatus 20, the greater the temperature rise caused by the heating of the hot airflow. The air outlet b of the accessory 10 is the farthest position from the drying apparatus 20, and is also a position on the accessory 10 that is heated by the hot airflow but has the smallest temperature rise. The single-layer sidewall 122 brings less overheating risk, and the heat transferred from the single-layer sidewall 122 to the multi-layer sidewall 123 is also less. Moreover, when using the drying apparatus 20, the user may generally consciously avoid direct contact with the air outlet b. As a result, the user may not get burned at the air outlet b.

[0026] In summary, it may be seen that the air outlet b of the accessory 10, as the part with the smallest temperature rise as a whole, has the least risk of overheating, and the user will consciously avoid touching the air outlet b, so the risk of overheating and burning at the air outlet b is small. The air outlet b is designed as a single-layer sidewall 122, and other areas of the accessory 10 with a higher risk of overheating are designed as a multi-layer sidewall 123, which may merge

into a single-layer sidewall 122 at the air outlet b in an integral manner. The thermal insulation chamber 124 may be formed without additional coupling structure, thereby reducing the temperature of the outer surface of the accessory 10 to avoid the user getting burned.

[0027] In addition, when using the drying apparatus 20 attached with the accessory 10, the user may often need to precisely control the direction of the output airflow, e.g. when drying hair, avoid emitting directly toward the hair scalp, but toward hair bundles that need to be styled and dried. The single-layer sidewall 122 may minimize the wall thickness and overall size of the air outlet b, making it easy and convenient for the user to precisely control the direction of the output airflow.

[0028] Therefore, the accessory 10 in the embodiment of the present disclosure not only takes into consideration better thermal insulation and lower production cost, but also has the characteristics of stable structure and convenient use.

[0029] As shown in FIG. 1a and FIG. 1b, some embodiments of the present disclosure also provide a drying assembly 100, comprising the above-mentioned drying apparatus 20 and the above-mentioned accessory 10. The relevant technical solutions and technical effects may refer to the preceding and will not be repeated.

[0030] As shown in the accessory 10 provided in some embodiments shown in FIG. 4, along the airflow direction x, the thermal insulation chamber 124 shrinks until it vanishes, and the multi-layer sidewall 123 merges into a single-layer sidewall 122 at the air outlet b.

[0031] From the forgoing, it may be seen that the closer an area of the accessory 10 to the drying apparatus 20 is, the greater the temperature rise caused by being heated by the hot airflow, and the corresponding thermal insulation chamber 124 will also be larger in size and stronger in heat insulation, so as to ensure that any outer wall of these areas will not be in danger of overheating. On the contrary, the further away the area from the drying apparatus 20, the smaller the temperature rise caused by being heated by the hot airflow, and the smaller the size of the corresponding thermal insulation chamber 124 is until it vanishes. The location where the thermal insulation chamber 124 vanishes is where the multi-layer sidewall 123 merges into a single-layer sidewall 122. In this way, the external dimensions of the accessory 10 may be simplified while ensuring the overall thermal insulation capability, so as to improve the ease of use.

[0032] A first direction y and a second direction z are introduced below for ease of description. As shown in the drawings of the present disclosure, the first direction y is perpendicular to the second direction z. A plane (y, z) is perpendicular to the airflow direction x. It should be noted that the airflow direction x shown in each drawing includes both positive and negative directions. A positive direction means a downstream direc-

tion of the airflow. The first direction y and the second direction z do not mean positive direction and negative direction. The arrows in the drawing are only examples, and the following description will not distinguish between the positive and negative directions. In addition, the accessory 10 may rotate at any angle relative to the drying apparatus 20. The first direction y and the second direction z are directions determined based on the size of the accessory 10, with nothing to do with the drying apparatus 20. For example, two directions of attaching the accessory 10 are shown in FIG. 1a and FIG. 1b. In other embodiments not shown before, the accessory 10 may also attach in other directions to the drying apparatus 20.

[0033] In some embodiments shown in FIG. 4 and FIG. 5, along the airflow direction x, the size of the guide chamber 121 increases along the first direction y and decreases along the second direction z. Moreover, the airflow portion 12 comprises a multi-layer sidewall 123 in at least part of the area along the first direction y, and a single-layer sidewall 122 along the second direction z.

[0034] When the accessory 10 is used together with the drying apparatus 20, the airflow emitted by the drying apparatus 20 passes through the guide chamber 121, being diffused along the first direction y and converging along the second direction z, to get flattened. The size of the airflow emitted from the air outlet b along the first direction y is significantly larger than that along the second direction z. The flat airflow at high-temperature is ideal for styling with a brush during hair drying.

[0035] Because the guide chamber 121 expands outward along the first direction y and shrinks inward along the second direction z, the user is more likely to touch the sidewall of the expansion part along the first direction y when using the accessory 10, but less easier to touch the sidewall of the shrinking part along the second direction z. Therefore, a multi-layer sidewall 123 is configured in at least part of the airflow portion 12 along the first direction y to improve thermal insulation capability and avoid burning the user.

[0036] In other embodiments, all parts of the airflow portion 12 except air outlet b along the first direction y and second direction z are configured as multi-layer sidewalls 123. In other embodiments, the first direction y and the second direction z of the airflow portion 12 are all configured as: one part as a single-layer sidewall 122, another part as a multi-layer sidewall 123. When the user grabs the accessory 10 through graphic guidance, instruction manual guidance, etc., his/her finger may touch a part configured with a multi-layer sidewall 123 along the first direction y and/or the second direction z.

[0037] In some embodiments shown in FIG. 6, the guide chamber 121 uniformly converges the airflow along a radial direction. The cross-section formed by rotating the accessory 10 at any angle with the airflow

direction x as an axis is the same, without distinguishing between the first direction and the second direction. Correspondingly, all areas on the airflow portion 12 except the air outlet b may be configured with a multi-layer sidewall 123 having a thermal insulation chamber 124. In some other embodiments not shown, one part of the entire airflow portion 12 may be designed as a single-layer sidewall 122 and another part as a multi-layer sidewall 123 except the air outlet b. When the user grabs the accessory 10 through graphic guidance, instruction manual guidance, etc., his/her fingers may touch a part of the multi-layer sidewall 123.

[0038] In some embodiments as shown in **FIG. 4**, the thermal insulation chamber 124 of the accessory 10 is configured such that the thermal insulation chamber 124 gradually shrinks in size along the first direction y until it vanishes along the airflow direction x. Combined with **FIG. 5** and some of the above-mentioned embodiments, the airflow portion 12 is flat as a whole, and its shape gradually transitions to a size that it's larger in the first direction y than in the second direction z. Correspondingly, the thermal insulation chamber 124 is configured radially outside the guide chamber 121 along the first direction y, so that the accessory 10 as a whole has a larger size along the first direction y. The user may contact the sidewall along the first direction y when taking the accessory 10 per guidance, so as to avoid getting burned. In some other embodiments not shown, the thermal insulation chamber 124 may also be configured radially outside the guide chamber 121 along the second direction z, of which the size gradually shrinks until it vanishes along the airflow direction x.

[0039] As shown in **FIG. 2**, and **FIG. 3**, in some embodiments, the air inlet a of the accessory 10 is circular, and its dimensions are the same along the first direction y and the second direction z. As shown in **FIG. 8**, the air outlet element 22 of the drying apparatus 20 is circular, and matches the size and shape of the air inlet a. The air outlet element 22 emits a cylindrical airflow, which enters the guide chamber 121 from the air inlet a.

[0040] As shown in **FIG. 4** and **FIG. 5**, the air outlet b of the accessory 10 is flat. It's larger than the air inlet a along the first direction y, and smaller than the air inlet a along the second direction z. Therefore, when the airflow passes from air inlet a to air outlet b, the size of the airflow becomes larger along the first direction Y, that is, it diffuses during passing, and the size becomes smaller along the second direction Z, that is, it converges during passing, resulting in a flat airflow.

[0041] It may be seen from **FIG. 2** that the flat airflow has a larger contact area with the sidewall along the second direction z of the accessory 10 and a smaller contact area with the sidewall along the first direction y. Therefore, the temperature rise of the sidewall along the first direction y of the accessory 10 is smaller than that of the sidewall along the second direction z. As shown in **FIG. 4**, in some more specific embodiments,

at least part of the sidewall of the accessory 10 along the first direction y is configured with a multi-layer side wall 123. When the user grabs the accessory 10, he/she touches the sidewall along the first direction y, where the temperature rise is small and the thermal insulation chamber 124 is configured inside, which can prevent the user from getting burned.

[0042] In some more specific embodiments, as shown in **FIG. 2**, **FIG. 3**, **FIG. 4**, the airflow portion 12 of the accessory 10 is configured with a concave-convex structure 126 outside the sidewall along the first direction y. The concave-convex structure 126 comprises a plurality of concave and convex parts that are successively spaced and alternately arranged. When the user's hand touches the concave-convex structure 126, he/she may only touch the convex part but not the concave part. Given the fact that the concave part and the convex part each accounting for 50% of the concave-convex structure 126 for example, when the user touches the concave-convex structure 126, compared with directly touching a plane, the contact area is reduced by 50% and the heat transfer rate as a result is reduced by 50%. At the same temperature, the concave and convex structure 126 reduces the amount of heat transferred to the user's fingers, thereby reducing the risk of getting burned.

[0043] In some embodiments as shown in **FIG. 8**, the drying apparatus 20 has a circular end, the center of which is configured with a circular air outlet element 22. A substantially cylindrical airflow is emitted from the air outlet element 22. Correspondingly, in some embodiments as shown in **FIG. 3**, the mounting portion 11 is annular and may be configured on the outer edge of the end of the drying apparatus 20 by magnetic connection, buckles, bolts, etc. The airflow portion 12 is configured inside the ring of the mounting portion 11 to correspond to the position of the airflow portion 12 of the drying apparatus 20. A part of the airflow portion 12, coupled to the mounting portion 11, extends annularly along the radial direction, so that the airflow portion 12 and the mounting portion 11 are coupled to each other. In some more specific embodiments, the air inlet a of the airflow portion 12 is circular, coinciding with the center of the circle of the annular mounting portion 11. In this way, the accessory 10 may rotate at any angle relative to the drying apparatus 20. For example, in **FIG. 1a** and **FIG. 1b**, the accessory 10 is attached to the drying apparatus 20 at two rotation angles. The air inlet a may be kept in the position corresponding to the airflow portion 12.

[0044] In some embodiments, the mounting portion 11 and the airflow portion 12 are integral molding structures. The advantages of integral molding may refer to the description above. In other embodiments, the mounting portion 11 and the airflow portion 12 may be two independent parts, which is mutually coupled to form the accessory 10 by bolts, buckles, magnets, gluing, and the like.

[0045] In some embodiments shown in FIG. 4, adjacent to the air inlet a of the accessory 10, the airflow portion 12 comprises an outer sidewall 123b and an inner sidewall 123a. The inside of the inner sidewall 123a forms an air inlet a, and the outer sidewall 123b extends radially and is coupled to the mounting portion 11. The outer sidewall 123b forms the outer wall of the accessory 10, which is coupled to the mounting portion 11 so that the mounting portion 11 and the airflow portion 12 are coupled to each other. The area between the outer sidewall 123b and the inner sidewall 123a is part of the thermal insulation chamber 124. When the accessory 10 is used together with the drying apparatus 20, the thermal insulation chamber 124 isolates the inner sidewall 123a and the outer sidewall 123b from each other. After the inner sidewall 123a is heated by the hot airflow, it is difficult to directly transfer heat to the outer sidewall 123b, thereby avoiding overheating of the outer sidewall 123b.

[0046] In the embodiment, the inner sidewall 123a and the outer sidewall 123b constitute the multi-layer sidewall 123 described above. Along the airflow direction x, the spacing between the inner sidewall 123a and the outer sidewall 123b gradually decreases, and the size of the thermal insulation chamber 124 formed by the two gradually decreases until the outer sidewall 123a and the inner sidewall 123b merge into a single-layer sidewall 122 and form an air outlet b. In other embodiments not shown, the number of layers of the multi-layer sidewalls 123 may be a plurality, such as 3 layers, 5 layers, 6 layers, etc., and the thermal insulation chamber 124 is configured between each adjacent layers. Therefore, when the number of layers of the multi-layer sidewall 123 is larger than or equal to 3, the airflow portion 12 will have at least two thermal insulation chambers 124 along a radial direction, which results in better thermal insulation performance. In a more specific embodiment, a plurality of radially adjacent thermal insulation chamber 124 may be coupled to each other to form a larger thermal insulation chamber 124, or a plurality of thermal insulation chamber 124 are isolated from each other to avoid thermal convection.

[0047] In some more specific embodiments shown in FIG. 3 and FIG. 4, along the airflow direction x, the outer sidewall 123b of the airflow portion 12 shrinks in size or remains unchanged along the first direction y, and shrinks in size along the second direction z. Together with some of the above-mentioned embodiments, along the first direction y, the size of the guide chamber 121 configured by the inner sidewall 123a of the airflow portion 12 gradually expands along the airflow direction x, and the outer sidewall 123b of the airflow portion 12 shrinks in size or remains unchanged along the airflow direction x, so that a thermal insulation chamber 124 that gradually shrinks in size along the airflow direction x is configured between the inner sidewall 123a and the outer sidewall 123b.

[0048] In some embodiments shown in FIG. 2, FIG. 4, and FIG. 7, the accessory 10 further comprises one or more vents 127 configured on the single-layer sidewall 122 at the air outlet b. When the user operates the drying apparatus 20, if the air outlet b is blocked, for example, the distance between the air outlet b and the hair comb or the hair is too close during hair drying, or there may be a foreign object blocking the air outlet B, the airflow may not smoothly leave the guide chamber 121 from the air outlet b, which may increase airflow pressure and temperature in the guide chamber 121, and then quickly overheat the motor of the airflow generating element of the drying apparatus 20. In order to avoid the above-mentioned issue, one or more vents 127 are configured on the single-layer sidewall 122 of the air outlet b. The vent 127 connects the guide chamber 121 to the external environment. When the air outlet b is blocked, the airflow may leave the guide chamber 121 from the vents 127, thereby avoiding increasing air pressure and temperature inside the guide chamber 121, and overheating of the motor of the airflow generating element of the drying apparatus 20.

[0049] Because the air outlet b is a single-layer sidewall 122, the radial thickness of the airflow portion 12 is the smallest there, and the vent 127 may connect the guide chamber 121 to the outside with the smallest length, thereby allowing the airflow to discharge quickly. Moreover, the vent 127 configured on the single-layer sidewall 122 will not be connected to the thermal insulation chamber 124, therefore preventing the hot airflow from entering the thermal insulation chamber 124 during the discharge.

[0050] In some specific embodiments as shown in FIG. 2, FIG. 4 and FIG. 7, the vent 127 is configured on the sidewall of the airflow portion 12 along the first direction y. Because the size of the sidewall along this direction is larger, the vent 127 may have a larger area to achieve quick discharge. In other embodiments not shown, the vent 127 may also be configured on the sidewall of the airflow portion 12 along the second direction z.

[0051] In some specific embodiments as shown in FIG. 6, the accessory 10 does not distinguish between the first direction and the second direction. The vent 127 may be configured at the air outlet b, with its position independent of the first direction and the second direction.

[0052] Among some embodiments shown in FIG. 3 and FIG. 7, the accessory 10 may also comprise a cover 13. The cover 13 is independent of the airflow portion 12, and is configured on the airflow portion 12 to seal the thermal insulation chamber 124. An outer end face of the cover 13 forms partially an outer end face of the accessory 10.

[0053] As shown in FIG. 4, along the airflow direction x, the downstream end of the thermal insulation chamber 124 gradually shrinks until it vanishes, which is equivalent to being sealed by the single-layer sidewall

122. The spacing of the upstream end of the thermal insulation chamber 124 is large (as the largest part of the thermal insulation chamber 124 to provide the best thermal insulation capability), which is sealed by a cover 13. In this way, the accessory 10 has a complete outer end face, and the user cannot observe and touch the inside of the thermal insulation chamber 124 from the outside, thereby reducing the risk of the user getting burned by accident.

[0054] In some specific embodiments, the cover 13 seals the thermal insulation chamber 124 so that it cannot communicate with the external environment, thereby preventing the hot airflow in the thermal insulation chamber 124 from flowing out. In some more specific embodiments, the thermal insulation chamber 124 may be evacuated to isolate air from thermal conduction. In other, more specific embodiments, the thermal insulation chamber 124 may be filled with a gas with lower thermal conductivity than air. The thermal conductivity of dry air is 0.026 (in W/mK, omitted below), and gases with lower thermal conductivity than dry air comprises argon (thermal conductivity 0.016), carbon dioxide (thermal conductivity 0.0146), krypton (thermal conductivity 0.0088), nitrogen (thermal conductivity 0.024), and xenon (thermal conductivity 0.0184).

[0055] In some other embodiments not shown, one or more vents may be configured on the cover 13 and/or the outer sidewall 123b, so that the thermal insulation chamber 124 may communicate with the external environment. The external air may enter the thermal insulation chamber 124 from the vents to dissipate heat, thereby further reducing the temperature of the outer sidewall 123b. More specifically, when the number of vents is one, the gas in the thermal insulation chamber 124 expands in volume after being heated, and emit from the vent; after the gas in the thermal insulation chamber 124 is cooled down, the volume decreases, and the airflow may be inhaled from the vent, such airflow exchange reduce the temperature of the thermal insulation chamber 124. When the number of vents is plurality, some vents form an air inlet hole, while other vents form an air outlet hole. The air in the thermal insulation chamber 124, after being heated, may directly exchange heat with the outside air, thereby reducing the temperature of the thermal insulation chamber 124. In conjunction with **FIG. 2** and some of the preceding embodiments, the vent may also be configured in the recess of the concave-convex structure 16. In this way, the user may avoid direct contact with the airflow passing from the thermal insulation chamber 124. Moreover, the vent may be hided to maintain the appearance consistency of the accessory 10.

[0056] In some other embodiments not shown, one part of the vent is configured to connect the thermal insulation chamber 124 to the guide chamber 121, the other part of the vent is configured to connect the thermal insulation chamber 124 to the external environment. When the airflow passes through the guide

chamber 121, the negative pressure generated draws the air in the thermal insulation chamber 124 into the guide chamber 121. The thermal insulation chamber 124 also draws air from the external environment simultaneously, so that cooler airflow is formed in the thermal insulation chamber 124.

[0057] In some embodiments shown in **FIG. 4** and **FIG. 7**, a mounting structure 125 is configured between the outer sidewall 123b and the inner sidewall 123a. The cover 13 is coupled to the mounting structure 125 through a mount. The mounting structure 125 may be buckles, screw holes, magnets, or the like, and correspondingly, the mount may be buckles, bolts, magnets and other structures. The cover 13 is coupled to the mounting structures 125 mutually, and the specific coupling method will not be discussed in the present disclosure.

[0058] The mounting structure 125 is configured in the thermal insulation chamber 124 between the outer sidewall 123b and the inner sidewall 123a. Because the thermal insulation chamber 124 has the largest size near the air inlet a, there is sufficient space to couple the mounting structure 125 at such location. Therefore, on the premise of maintaining sufficient coupling stability, the mounting structure 125 is hidden inside the sidewall of the accessory 10, resulting in overall appearance consistency. In other words, the thermal insulation chamber 124 is designed to shrink in size along the airflow direction x, which on the one hand, ensures the best thermal insulation performance near the air inlet a, and on the other hand, leaves sufficient space for the mounting structure 125.

[0059] In combination with some of the foregoing embodiments, the accessory 10 comprises at least two independent parts. Part (1) is the airflow portion 12 integrally formed and the mounting portion 11. Part (2) is the cover 13. The cover 13 is coupled to the mounting structure 125, that is, Part (1) is simply assembled to Part (2). In addition, Part (1) and Part (2) may be made of different materials respectively to achieve different physical properties at different parts of the accessory 10. For example, a material with better heat resistance may form the cover 13 to avoid overheating and melting of the accessory 10 in a part close to the drying apparatus 20. In some more specific embodiments, part of the cover 13 also seals the air inlet a. The air inlet a is part of the entire accessory 10 that is heated by the hot airflow and endures the highest temperature rise. The cover 13 then is made of a heat-resistant material. Sealing this area may specifically enhance the heat resistance the air inlet a, and prevent overheat and melting there.

[0060] Moreover, conventional accessories are generally designed as two or more parts along a radial direction. A radial coupling structure needs to be designed to couple multiple parts during assembly. The radial coupling structure will quickly transfer the internal heat to the outer surface through the heat transfer path

along the thickness direction of the accessory. The accessory 10 in the above-mentioned embodiment is designed as two parts in the axial direction (e.g., airflow direction x), and the mounting structure 125 itself extends along the axial direction, which does not form the heat transfer path in the thickness direction, and may play a role of reducing the heat transfer rate.

[0061] In some embodiments as shown in **FIG. 1a**, **FIG. 1b**, **FIG. 2**, and **FIG. 8**, the drying apparatus 20 of the drying assembly 100 may also emit infrared radiation. The infrared radiation may dry the target simultaneously with the airflow. Correspondingly, a radiation element 21 may be configured at the end of the drying apparatus 20 for emitting infrared radiation. A hollow portion c is configured on the accessory 10 for the infrared radiation to pass through. During hair drying, for example, the user may dry the hair by means of air or hot air together with infrared radiation at the same time using the drying assembly 100. Since infrared radiation does not dry objects by baking at high temperatures, the hair may be protected from damage caused by high temperature drying while maintaining the same drying efficiency. In the drawings of the present disclosure, a solid arrow indicates part of the transmission path of the infrared radiation.

[0062] When the user operates the drying assembly 100, the accessory 10 is detachably attached to the drying apparatus 20. Its air inlet a corresponds to the air outlet element 22, and the hollow portion c corresponds to at least part of the radiation element 21. The airflow emitted by the drying apparatus 20 passes through the inside of the airflow portion 12 and emits from the air outlet b. The infrared radiation emitted by the drying apparatus 20 transmits through and emits at least partially from the hollow portion c. Therefore, under the premise that the accessory 10 may change at least one airflow parameter of the airflow emitted by the drying apparatus 20, the infrared radiation of the drying apparatus 20 may also be transmitted, so as to ensure the airflow and the infrared radiation may dry the target at the same time.

[0063] In some embodiments as shown in **FIG. 8**, the central area of an end of the drying apparatus 20 forms an air outlet element 22. A ring-shaped radiation element 21 may be configured around an outer edge of the air outlet element 22. The radiation element 21 may be formed by a single ring-shaped radiation source or by a plurality of point-shaped radiation sources arranged along a ring. Correspondingly, in some embodiments shown in conjunction with **FIG. 2** and **FIG. 3**, the hollow portion c is configured between the airflow portion 12 and the mounting portion 11 of the accessory 10. The outer sidewall 123b of the airflow portion 12 spans the hollow portion c to be coupled to the mounting portion 11. The infrared radiation emitted from the radiation element 21 may pass between the airflow portion 12 and the mounting portion 11.

[0064] Combined with some of the foregoing embodiments, the airflow portion 12 may be flat as a whole, with a larger size along the first direction y, and forming the outer sidewall 123b extending along the first direction y. Its size along the second direction z is smaller, so the outer sidewall 123b has a smaller radiation-facing surface. Most of the infrared radiation emitted by the radiation element 21 passes through the hollow portion c. Only a small part of it located along the first direction y is obscured by the outer sidewall 123b. In this way, the flat airflow portion 12 may guide the airflow into a flat shape and avoid the transmission path of the infrared radiation, so that the user may operate the drying assembly 100 to dry the target simultaneously.

[0065] In some more specific embodiments, the accessory 10 further comprises a cover 13 made of a heat-resistant material and/or reflective material covering an area on the airflow portion 12 and the mounting portion 11 facing the radiation element 21. It may also be understood that the cover 13 covers the radiation-facing surface of the accessory 10 to prevent the accessory 10 from overheating and deformation by infrared radiation.

[0066] In some embodiments, the cover 13 is made of heat-resistant material that may withstand higher temperatures without deformation. In some embodiments, the cover 13 is made of reflective material, which may reflect most of the infrared radiation to reduce its own temperature rise. In some embodiments, the cover 13 is made of metal materials such as aluminum, steel, etc., which may have both heat resistance and reflectivity. In some embodiments, the base material of the cover 13 is made of heat-resistant material, and the surface of the base material forms a reflective surface through processes such as electroplating, so that it has both heat resistance and reflective properties.

[0067] In the description of this specification, references to the terms "one embodiment", "some embodiments", "schematic embodiments", "examples", "specific examples" or "some examples", etc., are intended to mean that the specific features, structures, materials or features described in conjunction with the embodiments or examples are contained in at least one embodiment or example of the present disclosure. In this specification, indicative representations of the above terms do not necessarily refer to the same embodiments or examples. Further, the specific features, structures, materials, or features described may be combined in an appropriate manner in any one or more embodiments or examples. In addition, without contradicting each other, those skilled in the art may combine the different embodiments or examples described in this specification and the features of the different embodiments or examples.

[0068] Notwithstanding the above illustrations and descriptions of the embodiments of the present disclosure, it is understood that the said embodiments are

illustrative and cannot be construed as limiting the present disclosure, and those skilled in the art may change, modify, replace and variate the said embodiments within the scope of the present disclosure.

Claims

1. An accessory, configured to be attached to a drying apparatus, the accessory comprising:

a mounting portion configured to be attached to the drying apparatus;
an airflow portion comprising an air inlet, a guide chamber and an air outlet,
wherein the airflow portion is an integral molding structure, and comprises:

a single-layer sidewall at the air outlet along a radial direction;
a multi-layer sidewall in at least other parts along a radial direction; and
a thermal insulation chamber between layers of the multi-layer sidewall.

2. The accessory of claim 1, wherein the thermal insulation chamber shrinks until it vanishes along a direction of an airflow, and the multi-layer sidewall merges into a single-layer sidewall at the air outlet.

3. The accessory of claim 1, wherein along a direction of an airflow, the size of the guide chamber increases along a first direction and decreases along a second direction;

the first direction is perpendicular to the second direction;
the multi-layer sidewall is configured in at least part of the airflow portion along the first direction and the single-layer sidewall is configured along the second direction.

4. The accessory of claim 3, wherein the air inlet is circular and its dimensions are the same along the first direction and the second direction, the air outlet is flat, and its size is larger than the air inlet along the first direction, and smaller than the air inlet along the second direction.

5. The accessory of claim 3, wherein along the direction of the airflow, the thermal insulation chamber gradually shrinks in size along the second direction until it vanishes.

6. The accessory of claim 3, wherein an outer sidewall of the airflow portion is configured with a concave-convex structure along the second direction.

7. The accessory of claim 6, wherein the outer sidewall of the airflow portion and/or the concave-convex structure are configured with one or more vents in connection with the thermal insulation chamber.

8. The accessory of claim 3, wherein, along the direction of the airflow, an outer sidewall of the airflow portion shrinks or remains unchanged along the first direction and shrinks along the second direction.

9. The accessory of claim 3, wherein the single layer sidewall is configured with one or more vents at the air outlet.

10. The accessory of claim 9, wherein the vent is configured along the first direction and/or on the single layer sidewall along the second direction.

11. The accessory of claim 1, wherein the mounting portion is annular, the airflow portion is configured inside the annular mounting portion, and a part of the airflow portion extends radially and is coupled to the mounting portion.

12. The accessory of claim 1, wherein the airflow portion comprises an outer sidewall and an inner sidewall at a part adjacent to the air inlet; wherein the air inlet is configured inside the inner sidewall, and the outer sidewall extends radially and is coupled to the mounting portion.

13. The accessory of claim 12, wherein a cover is configured in the airflow portion and seal the thermal insulation chamber; wherein an outer end face of the cover forms partially an outer end face of the accessory.

14. The accessory of claim 13, wherein the mounting structure is configured between the outer sidewall and the inner sidewall, and the cover is coupled to the mounting portion through a mount.

15. The accessory of claim 1, wherein the mounting portion and the airflow portion are integrally formed.

16. A drying assembly, the drying assembly comprising:

a drying apparatus;
the accessory according to any of claims 1 to 15.

17. The drying assembly of claim 16, wherein an end of the drying apparatus is configured with an air outlet element for emitting an airflow and a radia-

tion element for emitting infrared radiation;
wherein the accessory is configured to be detach-
ably attached to the drying apparatus, the air inlet
corresponds to the air outlet element, and the ac-
cessory comprises a hollow portion corresponding 5
to the radiation element.

18. The drying assembly of claim 17, wherein on the
accessory, the hollow portion is configured be- 10
tween the airflow portion and the mounting portion,
and the outer sidewall of the airflow portion spans
the hollow portion to be coupled to the mounting
portion.

19. The drying assembly of claim 17, wherein the ac- 15
cessory further comprises a cover made of a heat-
resistant material and/or a reflective material, and
the cover covers an area on the airflow portion and
the mounting portion facing the radiation element.

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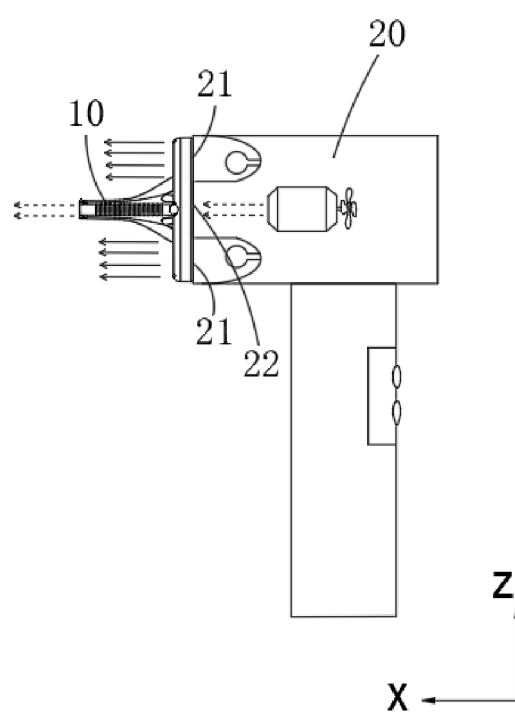


FIG. 1a

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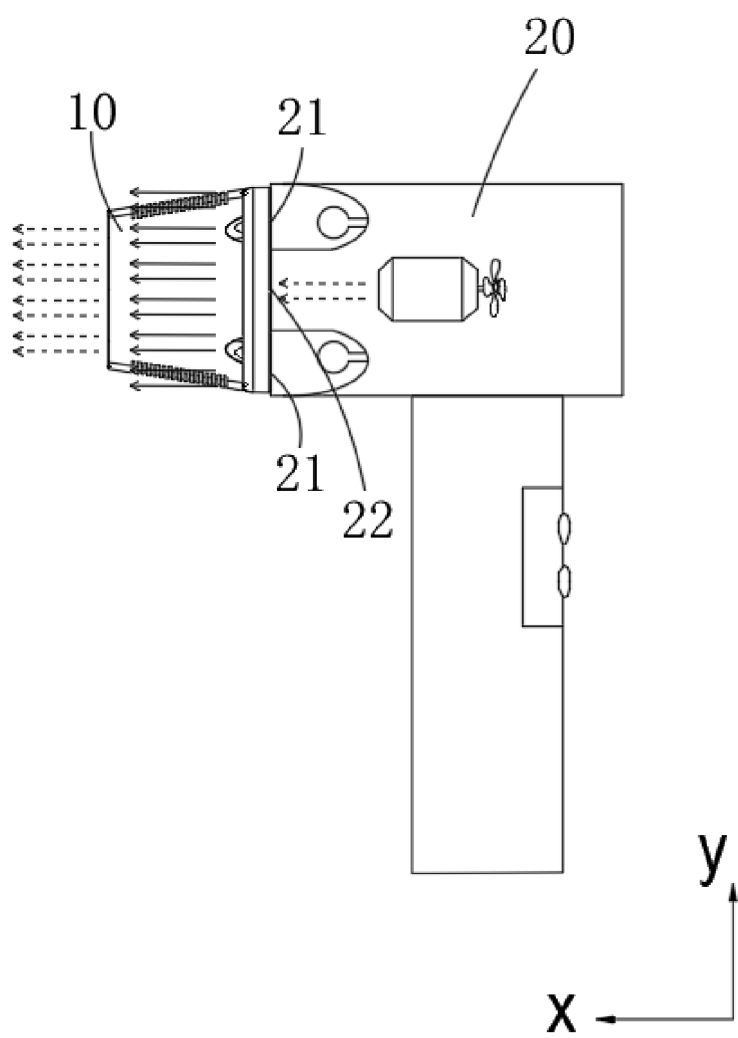


FIG. 1b

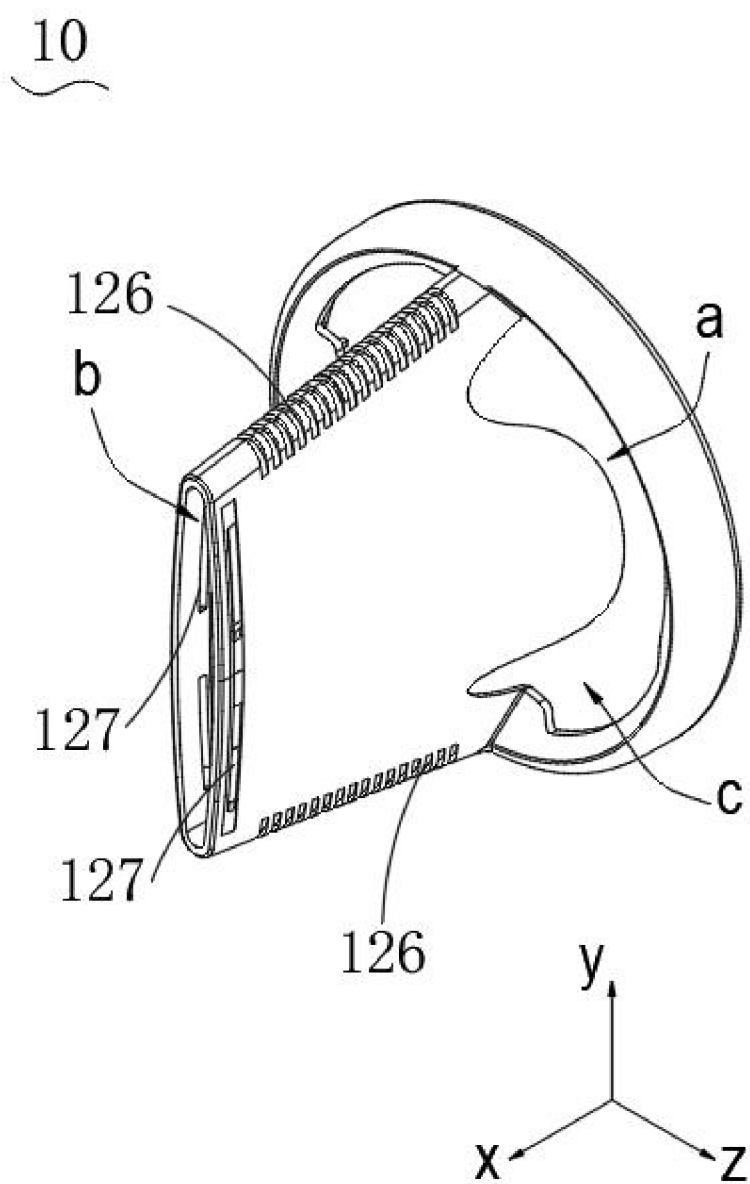


FIG. 2

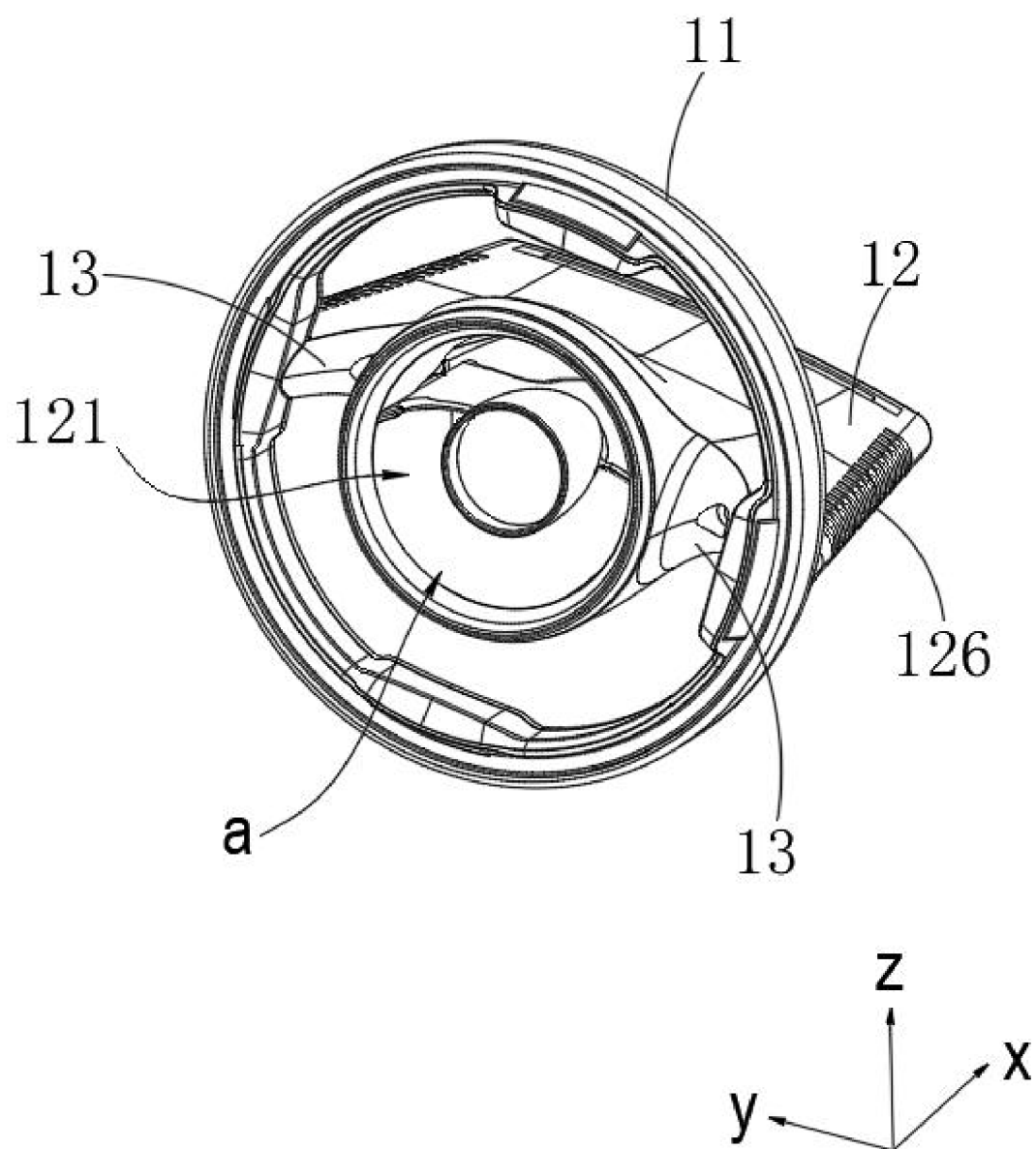


FIG. 3

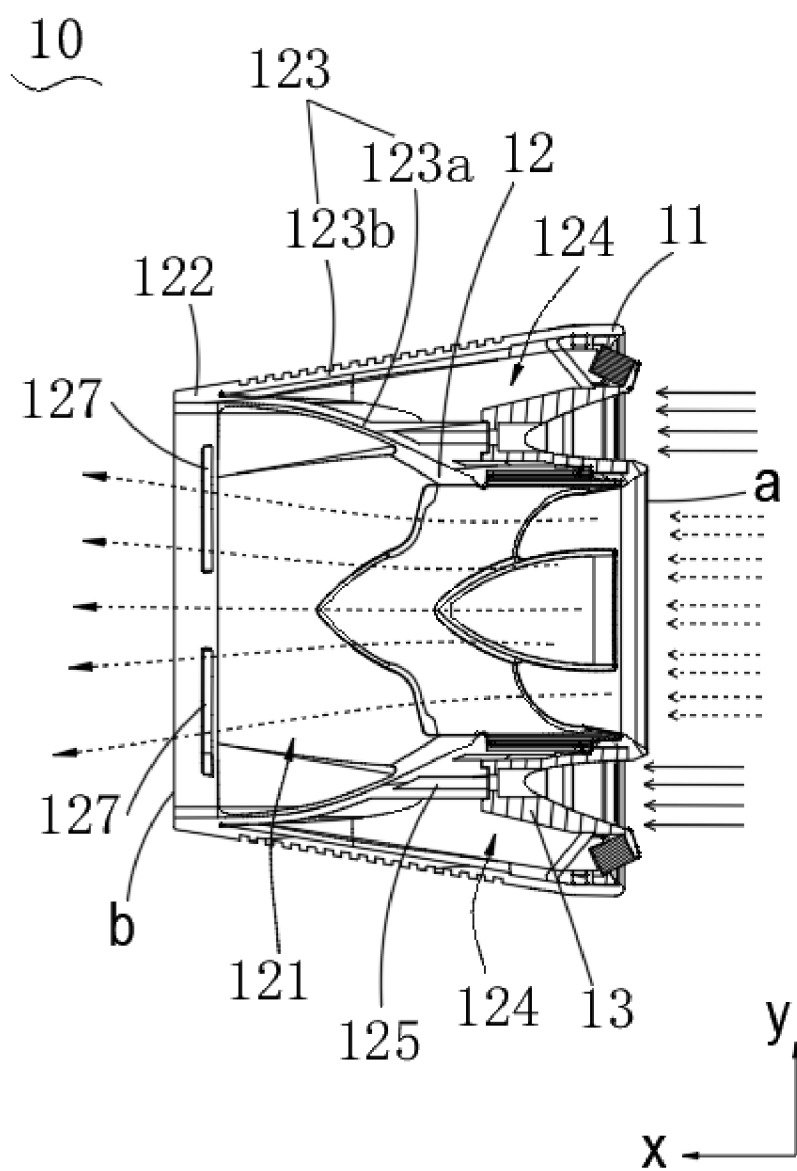


FIG. 4

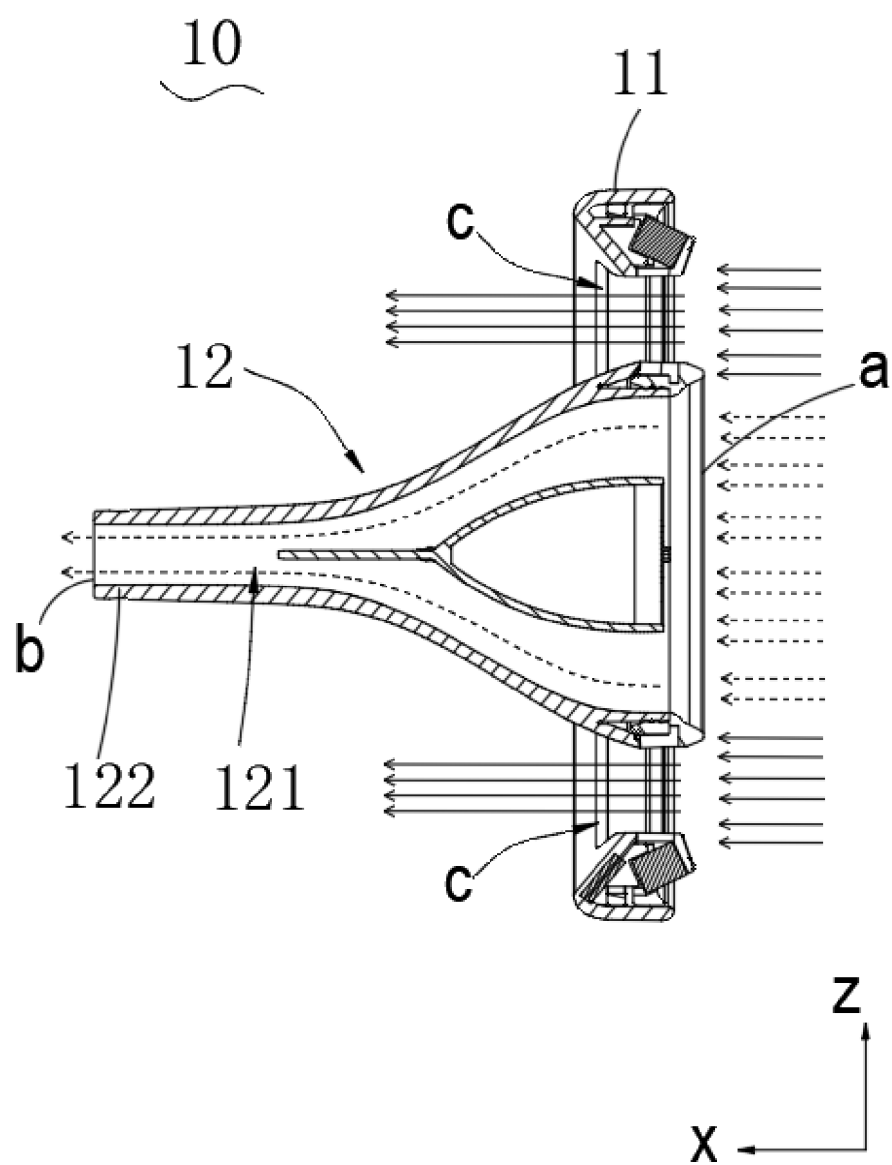


FIG. 5

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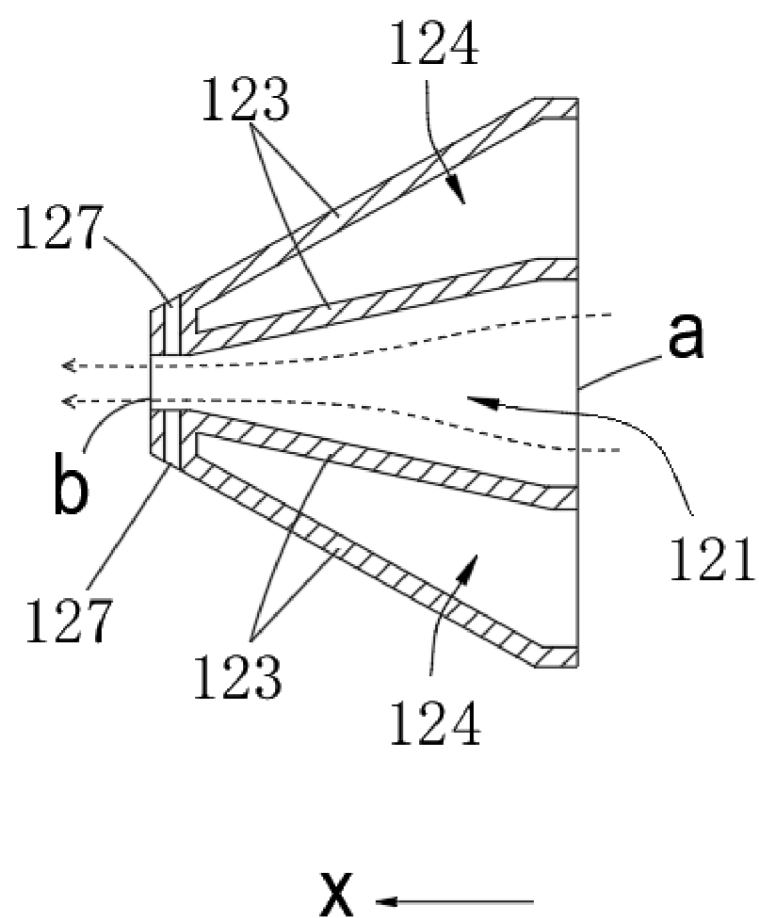


FIG. 6

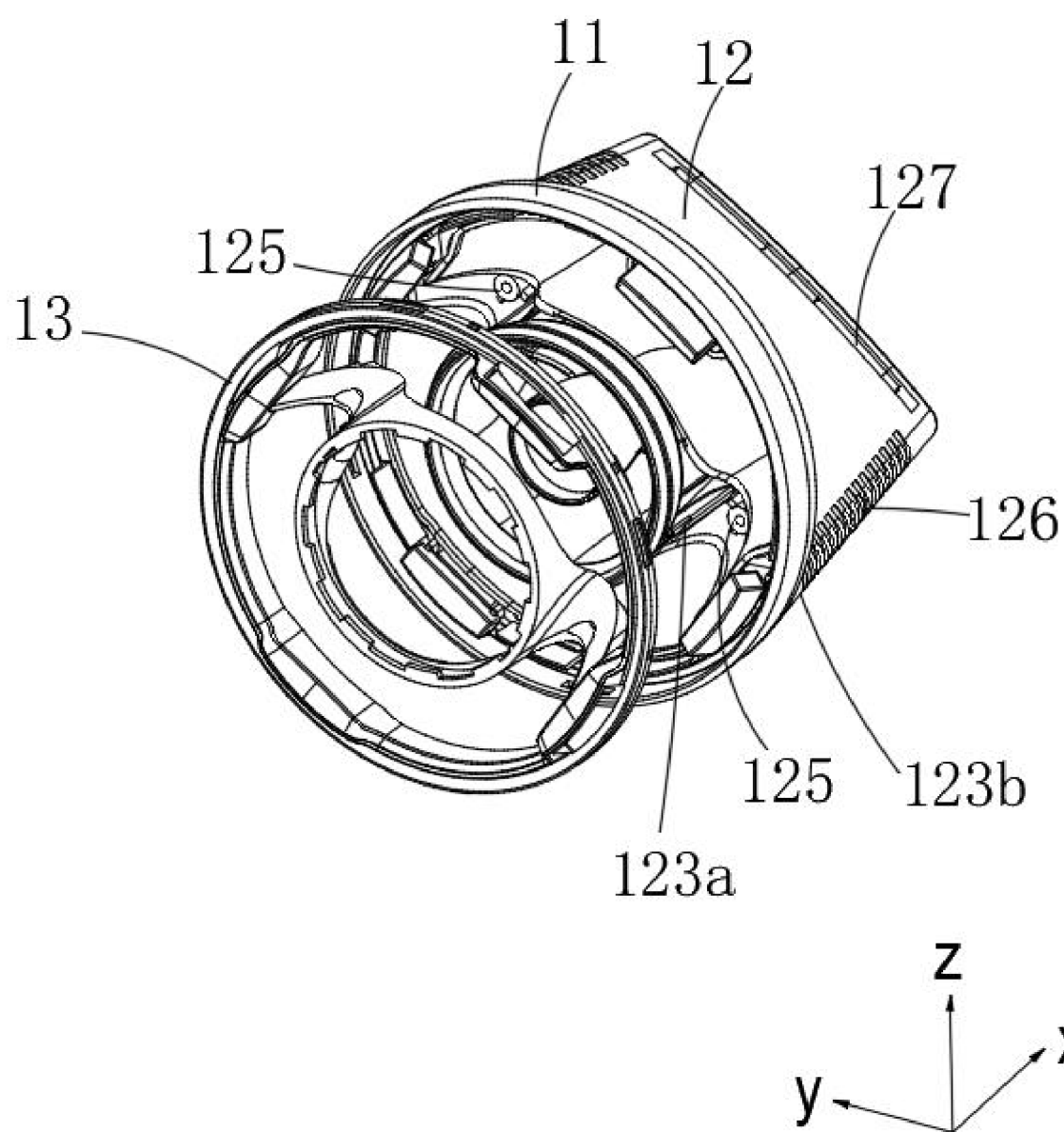


FIG. 7

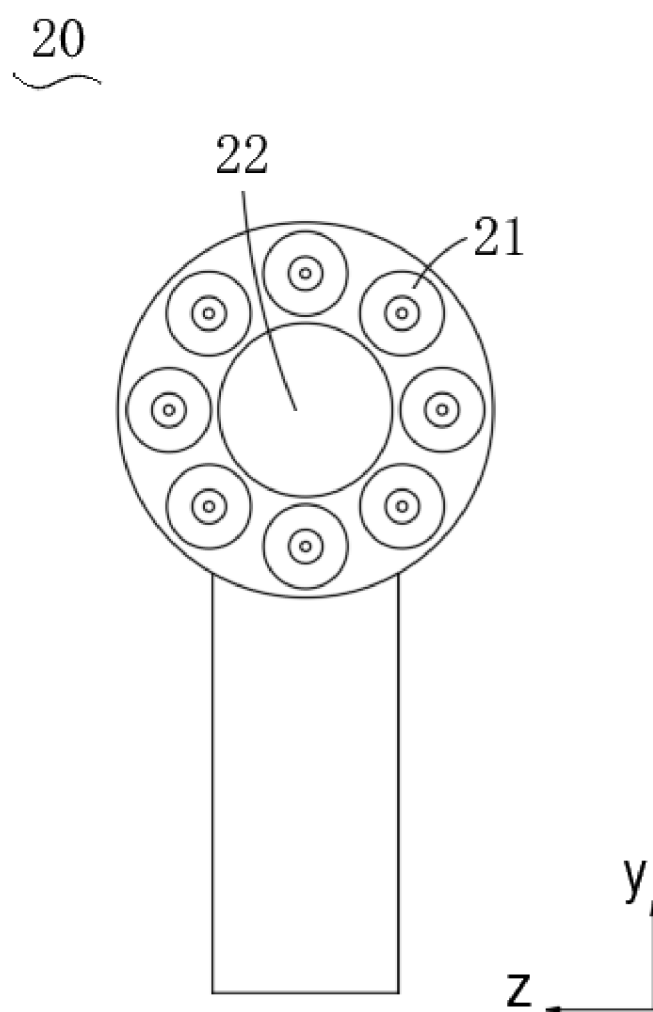


FIG. 8

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2023/137947

A. CLASSIFICATION OF SUBJECT MATTER

A45D20/12(2006.01)i; A45D20/10(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)

IPC: A45D

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

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

CNABS; WPABS; VEN; CNTXT; ENTXTC; ENTXT; CNKI: 深圳汝原科技有限公司, 风嘴, 吹嘴, 喷嘴, 隔热, 散热, 烫, 腔, 间隙, 空间, 间隔, nozzle, flow+, heat, prevent+, proof, insulat+, shield+, isolat+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 110250034 A (SHANGHAI XUNYUAN INDUSTRIAL CO., LTD.) 20 September 2019 (2019-09-20) description, paragraphs [0007]-[0066], and figures 1-5	1, 3, 4, 6-12, 15, 16
X	CN 214047877 U (DREAME TECHNOLOGY (SHANGHAI) CO., LTD.) 27 August 2021 (2021-08-27) description, paragraphs [0003]-[0052], and figures 1-8	1, 3, 4, 6-12, 15, 16
X	CN 204273554 U (FOURACE INDUSTRIES LTD.) 22 April 2015 (2015-04-22) description, paragraphs [0005]-[0037], and figures 1-8	1-12, 15, 16
X	CN 203341189 U (ZHANG HONGXING) 18 December 2013 (2013-12-18) description, paragraphs [0003]-[0029], and figures 1-6	1, 3, 4, 6-10, 15, 16
Y	CN 203341189 U (ZHANG HONGXING) 18 December 2013 (2013-12-18) description, paragraphs [0003]-[0029], and figures 1-6	2, 5, 11-14, 16-19
Y	WO 9423611 A1 (BEAUTRONIX (HONG KONG) LIMITED et al.) 27 October 1994 (1994-10-27) description, page 13, line 28 to page 14, line 13, and figures 5 and 6	2, 5, 16-19

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

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"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
"D" document cited by the applicant in the international application	"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
"E" earlier application or patent but published on or after the international filing date	"&" document member of the same patent family
"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)	
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 11 May 2024	Date of mailing of the international search report 21 May 2024
Name and mailing address of the ISA/CN China National Intellectual Property Administration (ISA/CN) China No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088	Authorized officer Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2023/137947

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Y	CN 116829026 A (SHENZHEN RUYUAN TECHNOLOGY CO., LTD.) 29 September 2023 (2023-09-29) description, paragraphs [0158]-[0185], and figures 6-16	17-19
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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2023/137947

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CN	216123969	U	25 March 2022	None	
CN	116829026	A	29 September 2023	None	
CN	219306200	U	07 July 2023	None	

Form PCT/ISA/210 (patent family annex) (July 2022)