



(11) **EP 4 772 041 A1**

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
08.07.2026 Bulletin 2026/28

(51) International Patent Classification (IPC):
A24F 40/40^(2020.01)

(21) Application number: **24881467.5**

(52) Cooperative Patent Classification (CPC):
A24F 40/10; A24F 40/40; A24F 40/42

(22) Date of filing: **14.10.2024**

(86) International application number:
PCT/CN2024/124779

(87) International publication number:
WO 2025/087101 (01.05.2025 Gazette 2025/18)

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

- **HU, Ruilong**
Shenzhen, Guangdong 518000 (CN)
- **FENG, Yuanhua**
Shenzhen, Guangdong 518000 (CN)
- **LIN, Fuwen**
Shenzhen, Guangdong 518000 (CN)
- **LIU, Yongqiang**
Shenzhen, Guangdong 518000 (CN)
- **XU, Zhongli**
Shenzhen, Guangdong 518000 (CN)
- **LI, Yonghai**
Shenzhen, Guangdong 518000 (CN)

(30) Priority: **26.10.2023 CN 202311402605**

(71) Applicant: **Shenzhen First Union Technology Co., Ltd.**
Shenzhen, Guangdong 518000 (CN)

(74) Representative: **Viering, Jentschura & Partner mbB**
Patent- und Rechtsanwälte
Am Brauhaus 8
01099 Dresden (DE)

(72) Inventors:
• **GUO, Zhiwei**
Shenzhen, Guangdong 518000 (CN)

(54) **ATOMIZER AND ELECTRONIC ATOMIZATION DEVICE**

(57) An atomizer (10) and an electronic atomization device (100) are provided. The atomizer includes a housing (101). The housing (101) is provided with a mouthpiece opening (101a). The housing (101) is internally provided with: a liquid storage cavity (101d) for storing a liquid substrate; a support (104), including a connecting portion (104a), where a chamber (104a1) is defined inside the connecting portion (104a), and an end of the connecting portion (104a) close to the liquid storage cavity (101d) is provided with an opening (101b) communicated with the chamber (104a1); an aerosol tube, where a first end of the aerosol tube is communicated with the mouthpiece opening (101a), a second end of the aerosol tube extends into the chamber (104a1) from the opening on one end of the connecting portion (104a), and

a side wall of the aerosol tube is further provided with a liquid guide opening (103a) located in the chamber (104a1); and an atomization assembly (102) arranged in the aerosol tube. A gap for providing a liquid flow path is defined in a local area between an outer surface of the aerosol tube and an inner surface of the connecting portion (104a), and the liquid guide opening (103a) is communicated with the gap, so that the liquid substrate flows to the atomization assembly (102) via the gap. The atomizer (10) is composed of components such as the support (104), the aerosol tube, and the atomization assembly (102), thereby simplifying the structural design of the atomizer (10) and reducing the cost of the atomizer (10).

EP 4 772 041 A1

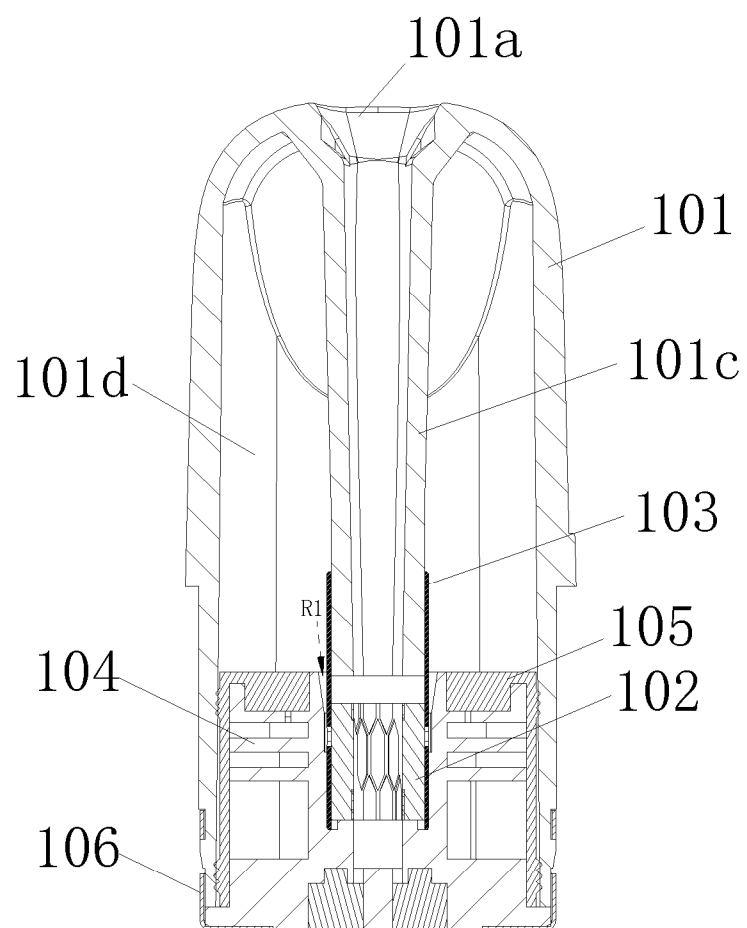


FIG. 4

Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to Chinese Patent Application No. 202311402605.9, filed with China National Intellectual Property Administration on October 26, 2023 and entitled "ATOMIZER AND ELECTRONIC ATOMIZATION DEVICE", which is incorporated herein by reference in its entirety.

TECHNICAL FIELD

[0002] This application relates to the field of electronic atomization technologies, and in particular, to an atomizer and an electronic atomization device.

BACKGROUND

[0003] An electronic atomization device is an electronic product that generates an aerosol by atomizing a liquid substrate for a user to inhale, which generally includes two parts: an atomizer and a power supply assembly. The atomizer has the liquid substrate stored therein and is provided with an atomization core for atomizing the liquid substrate. The power supply assembly includes a battery and a circuit board. For existing electronic atomization devices, atomizers have a complicated structural design and a higher cost.

SUMMARY

[0004] This application provides an atomizer and an electronic atomization device, to resolve the problems that atomizers of existing electronic atomization devices have a complicated structural design and a higher cost.

[0005] An aspect of this application provides an atomizer, including a shell. The shell is provided with a mouthpiece opening. The shell is internally provided with:

a liquid storage cavity for storing a liquid substrate;
a support, including a connecting portion, where a chamber is defined inside the connecting portion, and an end of the connecting portion close to the liquid storage cavity is provided with an opening communicated with the chamber;
an aerosol tube, where a first end of the aerosol tube is communicated with the mouthpiece opening, a second end of the aerosol tube extends into the chamber from the opening on one end of the connecting portion, and a side wall of the aerosol tube is further provided with a liquid guide opening located in the chamber; and
an atomization assembly arranged in the aerosol tube, where the atomization assembly is configured to atomize the liquid substrate to generate an aerosol.

[0006] A gap for providing a liquid flow path is defined in a local area between an outer surface of the aerosol tube and an inner surface of the connecting portion, and the liquid guide opening is communicated with the gap, so that the liquid substrate flows to the atomization assembly via the gap.

[0007] In some examples, the aerosol tube includes an aerosol output tube and a connecting tube.

[0008] The liquid guide opening is provided on the connecting tube. One end of the aerosol output tube forms the first end. One end of the connecting tube forms the second end. The other end of the aerosol output tube is connected to the other end of the connecting tube.

[0009] In some examples, the gap includes a liquid inlet groove provided on the inner surface of the connecting portion. The liquid inlet groove extends toward one end of the connecting portion.

[0010] In some examples, the aerosol tube is further provided with a notch groove extending from the second end toward the first end. The support further includes a limiting block disposed in the chamber and fitting with the notch groove. The limiting block is configured to provide installation guidance for the aerosol tube, for the liquid guide opening to be aligned with the liquid inlet groove.

[0011] In some examples, the support further includes an inclined portion. The inclined portion is formed by a part of an inner surface close to one end of the connecting portion being inclined relative to the outer surface of the aerosol tube.

[0012] In some examples, the aerosol tube is further provided with a notch groove extending from the second end toward the first end. An extending length of the notch groove is greater than a minimum distance between the second end and the inclined portion.

[0013] In some examples, the support further includes a supporting portion at least partially disposed in the chamber. The connecting portion includes a bottom wall extending from the inner surface of the connecting portion to an outer surface of the supporting portion. One end of the supporting portion protrudes beyond the bottom wall.

[0014] The second end of the aerosol tube is sandwiched between the inner surface of the connecting portion and the outer surface of the supporting portion and abuts against the bottom wall.

[0015] In some examples, the atomization assembly abuts against one end of the supporting portion so as to be supported by the supporting portion.

[0016] In some examples, the shell is further internally provided with a sealing member. The sealing member includes a first portion extending in a width direction of the atomizer. The first portion is provided with a through hole. The connecting portion and/or the aerosol tube extends into the through hole.

[0017] In some examples, an inner surface of the first portion is provided with a protrusion extending toward the bottom of the atomizer. An end surface of the end of the support close to the liquid storage cavity is provided with

a receiving portion. The protrusion is received in the receiving portion.

[0018] In some examples, the sealing member further includes a second portion extending from the first portion to the bottom of the atomizer. The second portion surrounds or encloses an outer surface of the support.

[0019] In some examples, the atomizer is internally provided with an air flow channel for guiding air flow. A part of the air flow channel is defined between an inner surface of the second portion and the outer surface of the support.

[0020] In some examples, the atomizer further includes an air pressure balancing channel formed between the first portion and the support and communicated with the liquid storage cavity, so as to supplement air into the liquid storage cavity.

[0021] Another aspect of this application provides an atomizer, including a shell. The shell is internally provided with:

a liquid storage cavity for storing a liquid substrate;
a support, including a connecting portion, where a chamber is defined inside the connecting portion, and an end of the connecting portion close to the liquid storage cavity is provided with an opening communicated with the chamber;
an atomization assembly, at least partially received inside the chamber from the opening, where the atomization assembly is configured to atomize the liquid substrate to generate an aerosol; and
a sealing member, including a first portion extending in a width direction of the atomizer and a second portion extending from the first portion to the bottom of the atomizer, where the first portion at least partially covers the top of the support, and the second portion surrounds or encloses an outer surface of the support.

[0022] Another aspect of this application further provides an electronic atomization device, including a power supply assembly and an atomizer.

[0023] The foregoing atomizer is an atomizer composed of components such as a support, an aerosol tube, and an atomization assembly, thereby simplifying the structural design of the atomizer and reducing the cost of the atomizer.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] One or more embodiments are exemplarily described with reference to the corresponding figures in the accompanying drawings, and the exemplary descriptions do not constitute a limitation to the embodiments. Components in the accompanying drawings that have the same reference numerals are represented as similar components, and unless otherwise particularly stated, the figures in the accompanying drawings do not constitute a proportional limitation.

FIG. 1 is a schematic diagram of an electronic atomization device according to an implementation of this application.

FIG. 2 is a schematic diagram of an atomizer according to an implementation of this application.

FIG. 3 is a schematic exploded view of an atomizer according to an implementation of this application.

FIG. 4 is a schematic cross-sectional view of an atomizer according to an implementation of this application.

FIG. 5 is another schematic cross-sectional view of an atomizer according to an implementation of this application.

FIG. 6 is a schematic diagram of an atomization assembly according to an implementation of this application.

FIG. 7 is a schematic diagram of a connecting tube according to an implementation of this application.

FIG. 8 is another schematic diagram of a connecting tube according to an implementation of this application.

FIG. 9 is a schematic diagram of a support according to an implementation of this application.

FIG. 10 is a schematic diagram of a support from another perspective according to an implementation of this application.

FIG. 11 is a schematic cross-sectional view of a support according to an implementation of this application.

FIG. 12 is another schematic cross-sectional view of a support according to an implementation of this application.

FIG. 13 is a schematic diagram of a sealing member according to an implementation of this application.

FIG. 14 is a schematic cross-sectional view of a sealing member according to an implementation of this application.

DETAILED DESCRIPTION

[0025] For ease of understanding this application, this application is described in more detail below with reference to the accompanying drawings and specific implementations. It should be noted that when an element is expressed as "being fixed to" another element, the element may be directly on the other element, or one or more intermediate elements may exist between the element and the other element. When one element is expressed as "being connected to" another element, the element may be directly connected to the other element, or one or more intermediate elements may exist between the element and the other element. Terms "upper", "lower", "left", "right", "inner", "outer", and similar expressions used in this specification are merely used for illustration.

[0026] Unless otherwise defined, meanings of all technical and scientific terms used in this specification are the same as that usually understood by a person skilled in the art. In this specification, terms used in this specification of

this application are merely intended to describe the specific implementations, and are not intended to limit this application. The term "and/or" used in this specification includes any or all combinations of one or more related listed items.

[0027] As used herein, terms 'upstream' and 'downstream' describe relative positions of parts or portions of parts in an electronic atomization device in a direction of flowing of inhaled air flow.

[0028] FIG. 1 is a schematic diagram of an electronic atomization device according to an implementation of this application.

[0029] As shown in FIG. 1, an electronic atomization device 100 includes an atomizer 10 and a power supply assembly 20. In some examples, the atomizer 10 and the power supply assembly 20 are non-removable. In some examples, the atomizer 10 is detachably connected to the power supply assembly 20, for example, by interference fit, snapping connection, or magnetic connection.

[0030] The atomizer 10 is configured to heat and atomize a liquid substrate to generate an aerosol. The power supply assembly 20 includes a battery cell 21 and a circuit 22. The battery cell 21 supplies electric power for operating the electronic atomization device 100. The battery cell 21 may be a rechargeable battery cell or a disposable battery cell. The circuit 22 may control overall operations of the electronic atomization device 100. The circuit 22 not only controls operations of the battery cell 21 and the atomizer 10, but also controls an operation of another element in the electronic atomization device 100.

[0031] FIG. 2 to FIG. 13 show schematic structural diagrams of an atomizer according to an embodiment. In this embodiment, the atomizer 10 includes:

a housing 101, having a mouthpiece opening 101a at a proximal end and an opening 101b at a distal end. The mouthpiece opening 101a may serve as an aerosol outlet. A user or an inhaler can inhale an aerosol generated by the electronic atomization device 100 via the mouthpiece opening 101a.

[0032] The housing 101 is internally provided with an aerosol output tube 101c and a liquid storage cavity 101d. An upper end of the aerosol output tube 101c is communicated with the mouthpiece opening 101a. A space between an outer surface of the aerosol output tube 101c and an inner surface of the housing 101 defines the liquid storage cavity 101d. To be specific, the liquid storage cavity 101d surrounds at least part of the aerosol output tube 101c. The liquid storage cavity 101d is configured to store a liquid substrate. The liquid storage cavity 101d is communicated with the opening 101b. An atomization assembly 102, a connecting tube 103, a support 104, and a sealing member 105 may be assembled into the housing 101 via the opening 101b.

[0033] In some examples, the inner surface of the housing 101 may be further provided with a positioning column (not shown). When the sealing member 105 is assembled into the housing 101 via the opening 101b, the sealing member 105 can be positioned by the positioning

column.

[0034] In some examples, at least part of the housing 101 is made of a transparent material, for example, transparent plastic, so that internal members and/or the liquid substrate may be observed through the housing 101.

[0035] As shown in FIG. 6, the atomization assembly 102 includes a liquid guide element 102a and a heating element 102b. The liquid guide element 102a is configured as a tubular structure in a length direction of the atomizer 10 or the housing 101 (an X direction as shown in FIG. 2). The liquid guide element 102a may be made of a flexible fiber material, for example, a cotton fiber, a non-woven fabric, or a sponge. Alternatively, in other examples, the liquid guide element 102a may be a rigid porous body, for example, a porous ceramic, or a porous glass.

[0036] The heating element 102b is close to an inner surface of the liquid guide element 102a, may be tightly attached to the inner surface of the liquid guide element 102a, or is partially or completely embedded in the heating element 102b. The heating element 102b may be a resistive heating mesh, a resistive heating coil, or the like. In a specific implementation, the heating element 102b may be formed by winding a sheet-shaped or mesh-shaped substrate. The wound heating element 102b is in a non-closed tubular structure in a circumferential direction, to be specific, is in a tubular structure having a side opening that extends in the length direction of the atomizer 10. A conductive pin 102c and a conductive pin 102d are welded or disposed at two ends of the heating element 102b, to guide a current on the heating element 102b.

[0037] As shown in FIG. 4, the connecting tube 103 is connected to the aerosol output tube 101c and the support 104, respectively. An upper end of the connecting tube 103 is sleeved over the aerosol output tube 101c, so that a lower end of the aerosol output tube 101c extends into the connecting tube 103. A lower end of the connecting tube 103 is inserted into or received in the support 104. The connecting tube 103 is preferably made of a relatively thin rigid material, such as stainless steel. The connecting tube 103 and the support 104 are connected by an interference fit, thereby achieving a tight connection and forming a seal therebetween at the same time. In other examples, the connecting tube 103 and the aerosol output tube 101c may be integrally formed. To be specific, an upper end of the integrally formed aerosol tube is communicated with the mouthpiece opening 101a, and a lower end thereof is connected to the support 104.

[0038] The atomization assembly 102 is disposed in the connecting tube 103. The atomization assembly 102 and the connecting tube 103 are disposed coaxially. The atomization assembly 102 is spaced apart from the lower end of the aerosol output tube 101c. As shown in FIG. 7 and FIG. 8, a side wall of the connecting tube 103 is further provided with a liquid guide opening 103a close to the lower end of the connecting tube 103. The liquid guide opening 103a is also received in the support 104. The

liquid substrate in the liquid storage cavity 101d may flow into the atomization assembly 102 via the liquid guide opening 103a, to be specific, is absorbed by the liquid guide element 102a and atomized by the heating element 102b to generate an inhalable aerosol.

[0039] The side wall of the connecting tube 103 is further provided with a notch groove 103b. The notch groove 103b is also received in the support 104. The notch groove 103b extends from the lower end of the connecting tube 103 to the upper end of the connecting tube 103.

[0040] In an example, as shown in FIG. 7 and FIG. 11, an extending length of the notch groove 103b is relatively large. In this way, a part of the liquid guide element 102a may be exposed, facilitating the liquid guide element 102a to absorb the liquid substrate. In addition, fit with a limiting block 104j of the support 104 may be realized, facilitating the connecting tube 103 to be assembled into the support 104. An outer surface of the liquid guide element 102a is provided with a protruding portion 102a1 extending radially outward. After assembly, the protruding portion 102a1 extends into the notch groove 103b to better absorb the liquid substrate.

[0041] In other examples, as shown in FIG. 8, the extending length of the notch groove 103b is relatively small. The liquid substrate is mainly delivered to the liquid guide element 102a via the liquid guide opening 103a on the side wall of the connecting tube 103, while the notch groove 103b is mainly configured to fit with the limiting block 104j of the support 104, facilitating the connecting tube 103 to be assembled into the support 104.

[0042] As shown in FIG. 4, the support 104 is close to the liquid storage cavity 101d. The support 104 is made of a hard material, such as plastic. The support 104 includes a connecting portion 104a and a supporting portion 104b arranged in the length direction of the atomizer 10.

[0043] As shown in FIG. 9 to FIG. 12, a chamber 104a1 is defined inside the connecting portion 104a. An upper end of the connecting portion 104a close to the liquid storage cavity 101d is provided with an opening communicated with the chamber 104a1. The atomization assembly 102 and the lower end of the connecting tube 103 extend into the chamber 104a1 from the opening at the upper end of the connecting portion 104a. The liquid guide opening 103a of the connecting tube 103 is located in the chamber 104a1. A gap for providing a liquid flow path is defined in a local area between an inner surface of the connecting portion 104a and an outer surface of the connecting tube 103. The liquid guide opening 103a is communicated with the gap, so that the liquid substrate in the liquid storage cavity 101d flows to the atomization assembly 102 via the gap. For the flow path of the liquid substrate, refer to as R1 shown in FIG. 4.

[0044] In a further implementation, the gap includes a liquid inlet groove 104a2 provided on the inner surface of the connecting portion 104a and close to the liquid guide opening 103a. The liquid inlet groove 104a2 extends toward the upper end of the connecting portion 104a.

The liquid inlet groove 104a2 can increase the gap between the inner surface of the connecting portion 104a and the outer surface of the connecting tube 103, and can, in addition, facilitate the liquid substrate to flow to the liquid guide opening 103a via the liquid inlet groove 104a2.

[0045] In a further implementation, a part of the inner surface close to the upper end of the connecting portion 104a is inclined relative to the outer surface of the connecting tube 103, thereby forming an inclined portion 104a3. By means of the inclined portion 104a3, the gap between the inner surface of the connecting portion 104a and the outer surface of the connecting tube 103 can be increased, facilitating to guide the liquid substrate into the connecting tube 103. In addition, when the liquid substrate in the liquid storage cavity is nearly exhausted, the inclined portion 104a3 can guide the remaining liquid substrate into the connecting tube 103, thereby improving the utilization rate of the liquid substrate.

[0046] In a still further implementation, as shown in FIG. 5 and FIG. 7, an extending length d1 of the notch groove 103b from the lower end of the connecting tube 103 to the upper end of the connecting tube 103 is greater than a minimum distance d2 between the lower end of the connecting tube 103 and the inclined portion 104a3. In this way, a part of the liquid guide element 102a located inside the connecting tube 103 is closer to, is exposed to, or protrudes to the inclined portion 104a3, so as to better absorb the liquid substrate guided by the inclined portion 104a3. Generally, a difference between d1 and d2 ranges from 0.2 mm to 1.5 mm, such as 0.5 mm, 0.6 mm, 0.8 mm, 1 mm, or 1.2 mm.

[0047] As shown in FIG. 11 and FIG. 12, the supporting portion 104b is at least partially disposed in the chamber 104a1. The connecting portion 104a further includes a bottom wall 104c extending from the inner surface of the connecting portion 104a to an outer surface of the supporting portion 104b in a width direction of the atomizer 10 (a Y direction shown in FIG. 2). During assembly, the lower end of the connecting tube 103 extends into the chamber 104a1 from the opening at the upper end of the connecting portion 104a. The lower end of the connecting tube 103 is sandwiched between the inner surface of the connecting portion 104a and the outer surface of the supporting portion 104b, and abuts against the bottom wall 104c. The atomization assembly 102 abuts against an upper end of the supporting portion 104b so as to be supported by the supporting portion 104b.

[0048] A part of the inner surface close to the lower end of the connecting portion 104a is tightly attached to the outer surface of the connecting tube 103, which can reduce or prevent the liquid substrate from flowing to the bottom wall 104c. A groove defined by the inner surface of the connecting portion 104a, the outer surface of the supporting portion 104b, and the bottom wall 104c may collect the leaked liquid substrate or condensed liquid substrate, reducing the risk that the liquid substrate leaks out of the atomizer 10 or into the power supply

assembly 20.

[0049] In a further implementation, the limiting block 104j fitting with the notch groove 103b is further disposed in the chamber 104a1 or on the bottom wall 104c. During assembly, the limiting block 104j is configured to provide installation guidance for the connecting tube 103, so that the liquid guide opening 103a is aligned with the liquid inlet groove 104a2. Specifically, the notch groove 103b is aligned with the limiting block 104j, thereby inserting the connecting tube 103 into the connecting portion 104a. After being assembled in place, the liquid inlet groove 104a2 is aligned with the liquid guide opening 103a, and the limiting block 104j can limit circumferential motion of the connecting tube 103.

[0050] As shown in FIG. 9, the support 104 further includes an air inlet tube 104d extending in the length direction of the atomizer 10. The air inlet tube 104d is disposed outside the connecting portion 104a. The air inlet tube 104d is close to the connecting portion 104a. An air inlet end of the air inlet tube 104d is located on an end surface of a bottom end of the support 104. An air outlet end of the air inlet tube 104d is located substantially at the middle of the support 104. The air outlet end of the air inlet tube 104d is close to one side of the support 104 in the width direction of the atomizer 10.

[0051] A side wall of the supporting portion 104b is provided with an air inlet hole 104b1. An air inlet end of the air inlet hole 104b1 is offset from the air outlet end of the air inlet tube 104d. The air inlet end of the air inlet hole 104b1 is close to one side of the support 104 in a thickness direction of the atomizer 10 (a Z direction shown in FIG. 2). In this way, after flowing in the air inlet end of the air inlet tube 104d, external air flows out from the air outlet end of the air inlet tube 104d to a space between the support 104 and the sealing member 105, flows along a gap between the support 104 and the sealing member 105, flows into a hollow portion inside the supporting portion 104b via the air inlet hole 104b1, and then flows to the atomization assembly 102 disposed in the connecting tube 103. After mixing with an aerosol generated by the atomization assembly 102, the air is delivered to the mouthpiece opening 101a via the aerosol output tube 101c. For a specific air flow path, refer to the description shown by R2 in FIG. 5 and FIG. 9.

[0052] The support 104 further includes an electrode hole 104e and an electrode hole 104f extending in the length direction of the atomizer 10. Openings of the electrode hole 104e and the electrode hole 104f are located on the end surface of the bottom end of the support 104. The electrode hole 104e and the electrode hole 104f are spaced apart from each other. An electrode 107 is disposed in the electrode hole 104e. An electrode 108 is disposed in the electrode hole 104f. The electrode 107 and the electrode 108 are configured to be electrically connected to the battery cell 21.

[0053] As shown in FIG. 11, the supporting portion 104b is provided with a wire passage hole 104b2 communicated with the electrode hole 104e, and a wire

passage hole 104b3 communicated with the electrode hole 104f. The wire passage hole 104b2 and the wire passage hole 104b3 are spaced apart from each other. With reference to FIG. 6, the conductive pin 102c connected to the heating element 102b may be kept in contact with the electrode 107 via the wire passage hole 104b2 so as to form an electrical connection. The conductive pin 102d connected to the heating element 102b may be kept in contact with the electrode 108 via the wire passage hole 104b3 so as to form an electrical connection.

[0054] As shown in FIG. 10, the support 104 further includes a receiving portion 104g. The receiving portion 104g is formed by recessing a part of the end surface of the top of the support 104. The receiving portion 104g is close to one side of the support 104 in the width direction of the atomizer 10. In the example shown in FIG. 10, two receiving portions 104g are respectively disposed at left and right sides of the connecting portion 104a.

[0055] As shown in FIG. 9, a fin 104h is further disposed between the receiving portion 104g and the air inlet tube 104d. The fin 104h and the receiving portion 104g are spaced apart each other. The fin 104h extends outward from an outer surface of the connecting portion 104a in the width direction of the atomizer 10. There may be a plurality of fins 104h. The plurality of fins 104h are spaced apart from one another. The liquid substrate or the condensed liquid substrate may be stored in a gap between two adjacent fins 104h or in a gap between the fin 104h and the receiving portion 104g.

[0056] As shown in FIG. 10, the support 104 further includes a flange 104i close to the bottom end of the support 104. The flange 104i extends outward from the outer surface of the support 104 in the width direction of the atomizer 10. During assembly, the distal end of the housing 101 abuts against the flange 104i.

[0057] As shown in FIG. 13 to FIG. 14, the sealing member 105 is made of a flexible material. The sealing member 105 may be made of a flexible material such as silica gel, a thermo-plastic-elastomer, or thermo-plastic-rubber. Preferably, the sealing member is made of a single material such as the thermo-plastic-elastomer.

[0058] The sealing member 105 includes a first portion 105a extending in the width direction of the atomizer 10 and a second portion 105b extending from the first portion 105a to the bottom of the atomizer 10.

[0059] The first portion 105a is provided with a through hole 105a1. An inner surface of the first portion 105a is provided with a protrusion 105a2 extending toward the bottom of the atomizer 10. During assembly, the upper end of the connecting portion 104a extends into the through hole 105a1, so as to seal a part of the outer surface of the connecting portion 104a. The protrusion 105a2 is received in the receiving portion 104g, so as to cover a part of the end surface of the top of the support 104 and form a seal thereon.

[0060] The second portion 105b is substantially of a tubular structure. During assembly, the second portion

105b is sandwiched between the inner surface of the housing 101 and the outer surface of the support 104. The second portion 105b surrounds or encloses the outer surface of the support 104. In this way, while forming a seal, air flowing out from the air outlet end of the air inlet tube 104d is allowed to flow into the air inlet hole 104b1 along the gap between the support 104 and the sealing member 105.

[0061] In a further implementation, the outer surface of the second portion 105b is further provided with a flange 105b1 and a flange 105b2 spaced apart from each other. The flange 105b1 and the flange 105b2 abut against the inner surface of the housing 101, so as to achieve a good sealing effect.

[0062] In a further implementation, an air pressure balancing channel is further disposed between the sealing member 105 and the support 104, for supplementing air into the liquid storage cavity 101d to relieve a negative pressure in the liquid storage cavity 101d.

[0063] With further reference to FIG. 10 to FIG. 11, the support 104 is further provided with an air flow groove 104g1. One end of the air flow groove 104g1 penetrates a bottom wall of the receiving portion 104g, and the other end of the air flow groove 104g1 extends on an inner surface of the receiving portion 104g, and then extends to the end surface of the upper end of the connecting portion 104a via the outer surface of the connecting portion 104a. In this way, after assembly, the protrusion 105a2 covers the air flow groove 104g1 to form the air pressure balancing channel. External air may flow in from one end of the air flow groove 104g1 and flow out from the other end of the air flow groove 104g1 so as to enter the liquid storage cavity 101d, thereby relieving the negative pressure in the liquid storage cavity 101d.

[0064] As shown in FIG. 3, a bottom cover 106 is detachably coupled to the housing 101, thereby defining and forming a shell of the atomizer 10. In a preferred implementation, the bottom cover 106 is in a snapping connection with the housing 101. The bottom cover 106 is provided with a through hole 106a to expose the electrode 107, the electrode 108, and the air inlet end of the air inlet tube 104d.

[0065] It should be noted that, the specification of this application and the accompanying drawings thereof illustrate preferred embodiments of this application. However, this application can be implemented in various different forms, and is not limited to the embodiments described in this specification. These embodiments are not intended to be an additional limitation on the content of this application, and are described for the purpose of providing a more thorough and comprehensive understanding of the disclosure of this application. Moreover, the foregoing technical features may further be combined to form various embodiments not listed above, and all such embodiments shall be construed as falling within the scope of the specification of this application. Further, a person of ordinary skill in the art may make improvements and variations based on the above descriptions,

and such improvements and variations shall all fall within the protection scope of the appended claims of this application.

Claims

1. An atomizer, comprising a shell, wherein the shell is provided with a mouthpiece opening, and the shell is internally provided with:

a liquid storage cavity for storing a liquid substrate;

a support, comprising a connecting portion, wherein a chamber is defined inside the connecting portion, and an end of the connecting portion close to the liquid storage cavity is provided with an opening communicated with the chamber;

an aerosol tube, wherein a first end of the aerosol tube is communicated with the mouthpiece opening, a second end of the aerosol tube extends into the chamber from the opening on one end of the connecting portion, and a side wall of the aerosol tube is further provided with a liquid guide opening located in the chamber; and an atomization assembly arranged in the aerosol tube, wherein the atomization assembly is configured to atomize the liquid substrate to generate an aerosol,

a gap for providing a liquid flow path is defined in a local area between an outer surface of the aerosol tube and an inner surface of the connecting portion, and the liquid guide opening is communicated with the gap, for the liquid substrate to flow to the atomization assembly via the gap.

2. The atomizer according to claim 1, wherein the aerosol tube comprises an aerosol output tube and a connecting tube; the liquid guide opening is provided on the connecting tube, one end of the aerosol output tube forms the first end, one end of the connecting tube forms the second end, and the other end of the aerosol output tube is connected to the other end of the connecting tube.
3. The atomizer according to claim 1, wherein the gap comprises a liquid inlet groove provided on the inner surface of the connecting portion, and the liquid inlet groove extends toward one end of the connecting portion.
4. The atomizer according to claim 3, wherein the aerosol tube is further provided with a notch groove extending from the second end toward the first end, the support further comprises a limiting block

disposed in the chamber and fitting with the notch groove, and the limiting block is configured to provide installation guidance for the aerosol tube, for the liquid guide opening to be aligned with the liquid inlet groove.

5. The atomizer according to claim 1, wherein the support further comprises an inclined portion, and the inclined portion is formed by a part of an inner surface close to one end of the connecting portion being inclined relative to the outer surface of the aerosol tube.

6. The atomizer according to claim 5, wherein the aerosol tube is further provided with a notch groove extending from the second end toward the first end, and an extending length of the notch groove is greater than a minimum distance between the second end and the inclined portion.

7. The atomizer according to claim 1, wherein the support further comprises a supporting portion at least partially disposed in the chamber, the connecting portion comprises a bottom wall extending from the inner surface of the connecting portion to an outer surface of the supporting portion, and one end of the supporting portion protrudes beyond the bottom wall;
the second end of the aerosol tube is sandwiched between the inner surface of the connecting portion and the outer surface of the supporting portion and abuts against the bottom wall.

8. The atomizer according to claim 7, wherein the atomization assembly abuts against one end of the supporting portion so as to be supported by the supporting portion.

9. The atomizer according to claim 1, wherein the shell is further internally provided with a sealing member, the sealing member comprises a first portion extending in a width direction of the atomizer, the first portion is provided with a through hole, and the connecting portion and/or the aerosol tube extends into the through hole.

10. The atomizer according to claim 9, wherein an inner surface of the first portion is provided with a protrusion extending toward the bottom of the atomizer, an end surface of the end of the support close to the liquid storage cavity is provided with a receiving portion, and the protrusion is received in the receiving portion.

11. The atomizer according to claim 9, wherein the sealing member further comprises a second portion extending from the first portion to the bottom of the atomizer, and the second portion surrounds or en-

closes an outer surface of the support.

12. The atomizer according to claim 11, wherein the atomizer is internally provided with an air flow channel for guiding air flow, and a part of the air flow channel is defined between an inner surface of the second portion and the outer surface of the support.

13. The atomizer according to claim 9, further comprising an air pressure balancing channel formed between the first portion and the support and communicated with the liquid storage cavity, so as to supplement air into the liquid storage cavity.

14. An atomizer, comprising a shell, wherein the shell is internally provided with:

a liquid storage cavity for storing a liquid substrate;

a support, comprising a connecting portion, wherein a chamber is defined inside the connecting portion, and an end of the connecting portion close to the liquid storage cavity is provided with an opening communicated with the chamber;

an atomization assembly, at least partially received inside the chamber from the opening, wherein the atomization assembly is configured to atomize the liquid substrate to generate an aerosol; and

a sealing member, comprising a first portion extending in a width direction of the atomizer and a second portion extending from the first portion to the bottom of the atomizer, wherein the first portion at least partially covers the top of the support, and the second portion surrounds or encloses an outer surface of the support.

15. An electronic atomization device, comprising a power supply assembly and the atomizer according to any one of claims 1 to 14.

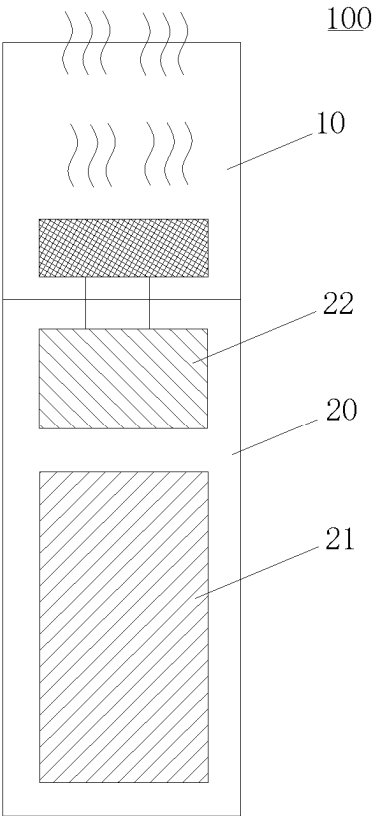


FIG. 1

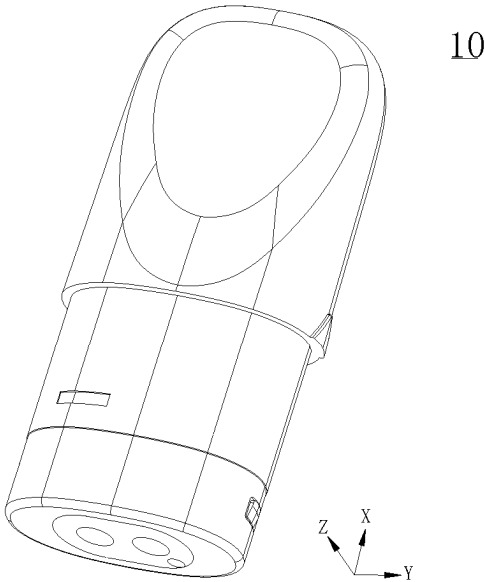


FIG. 2

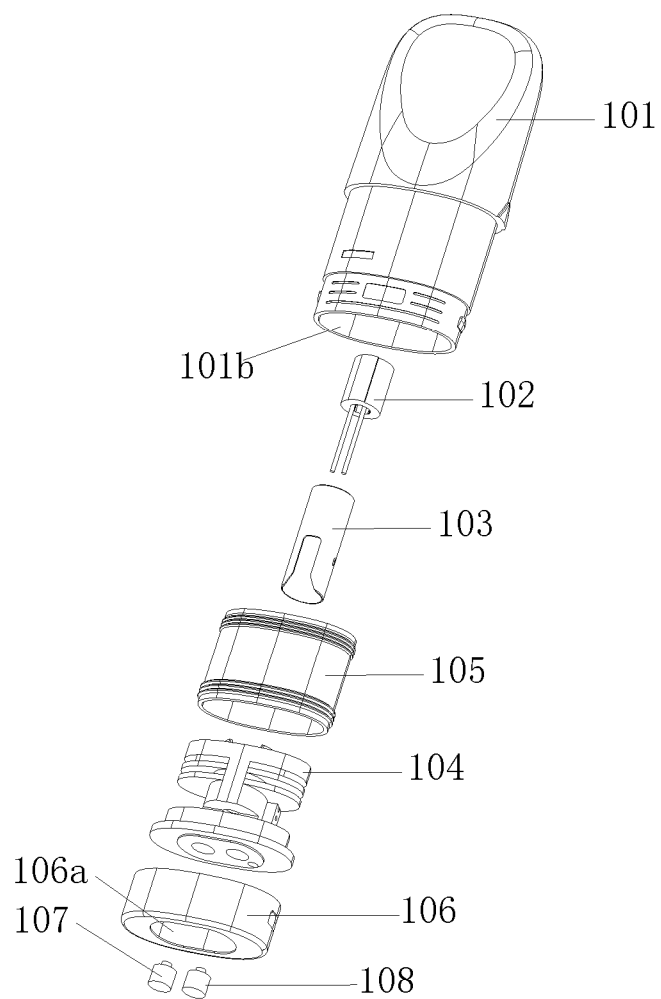


FIG. 3

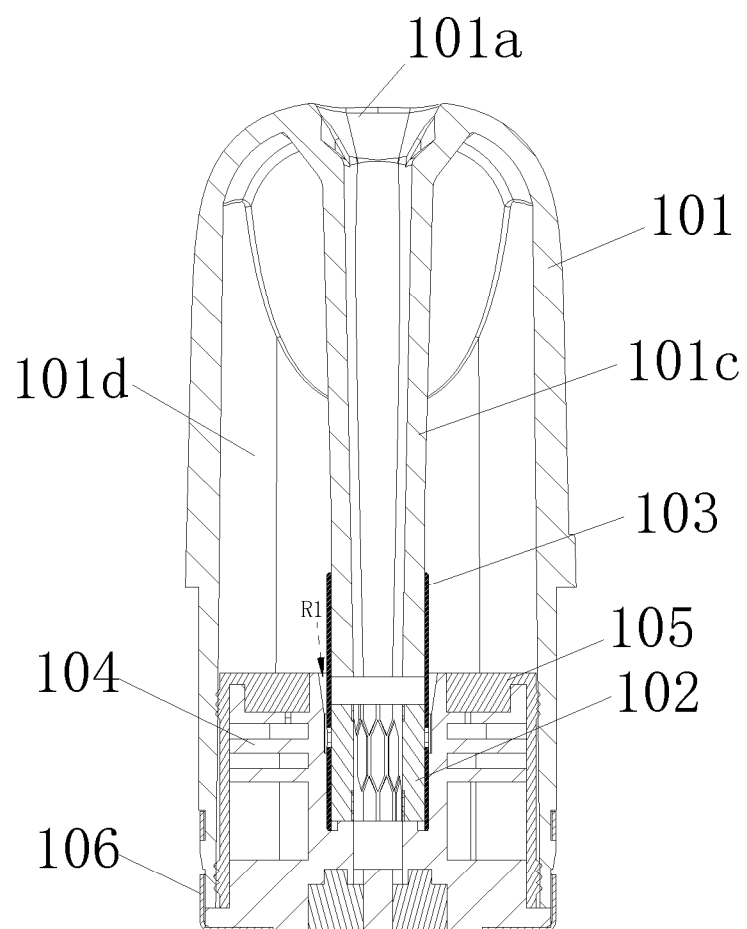


FIG. 4

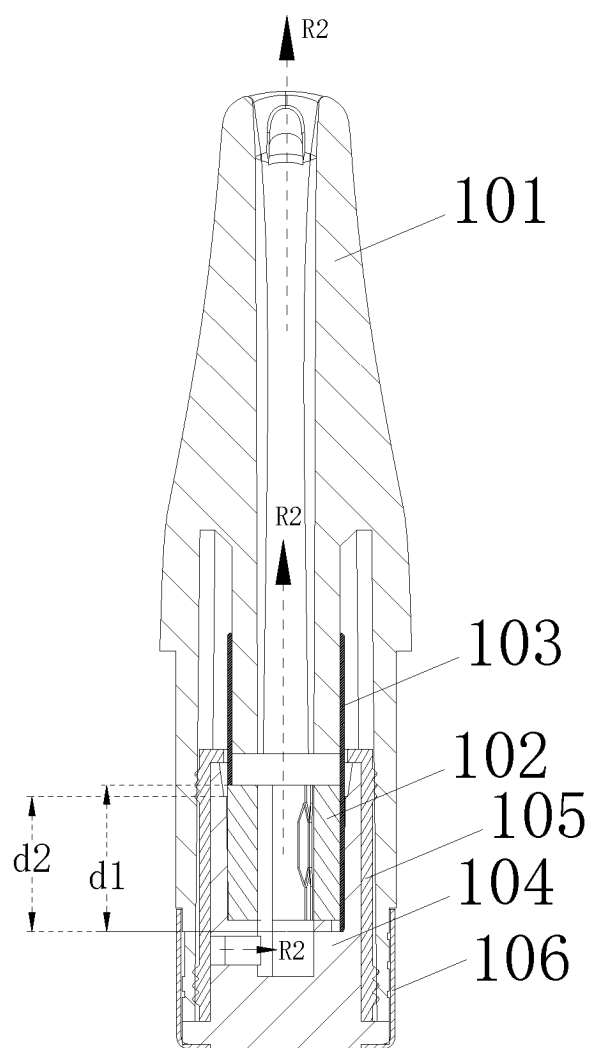


FIG. 5

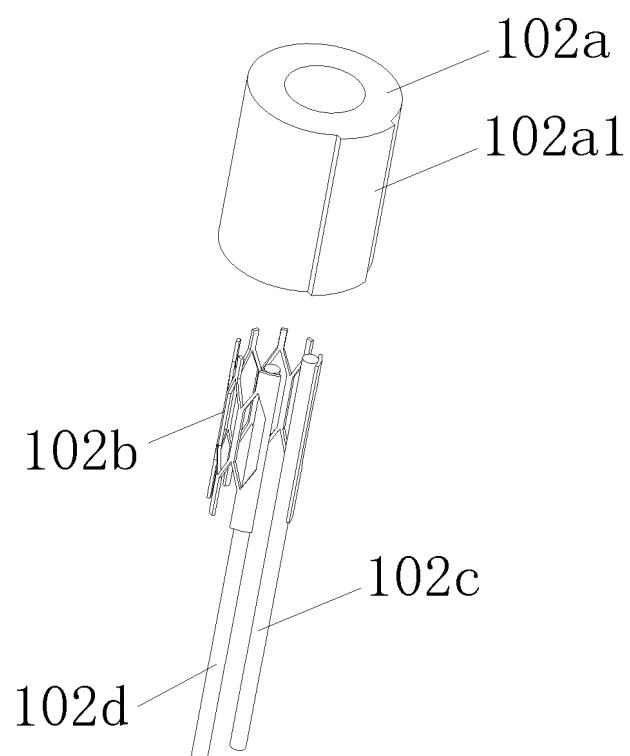


FIG. 6

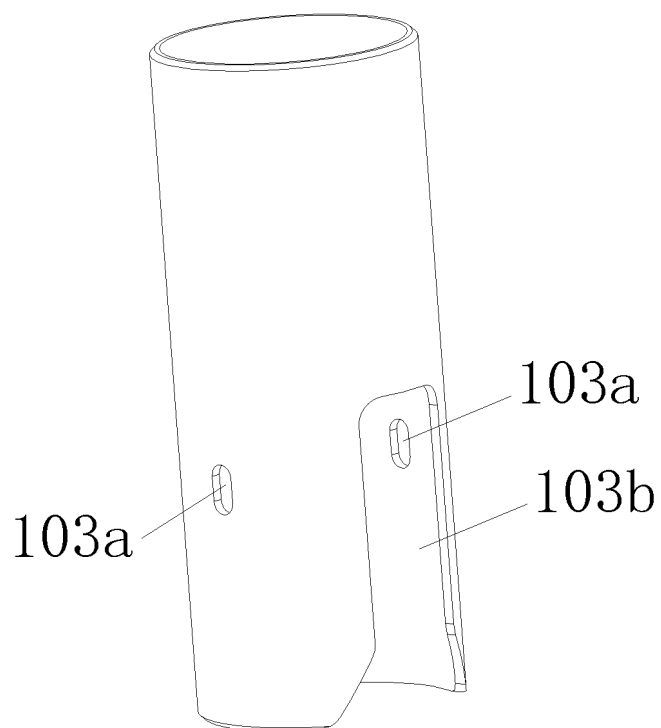


FIG. 7

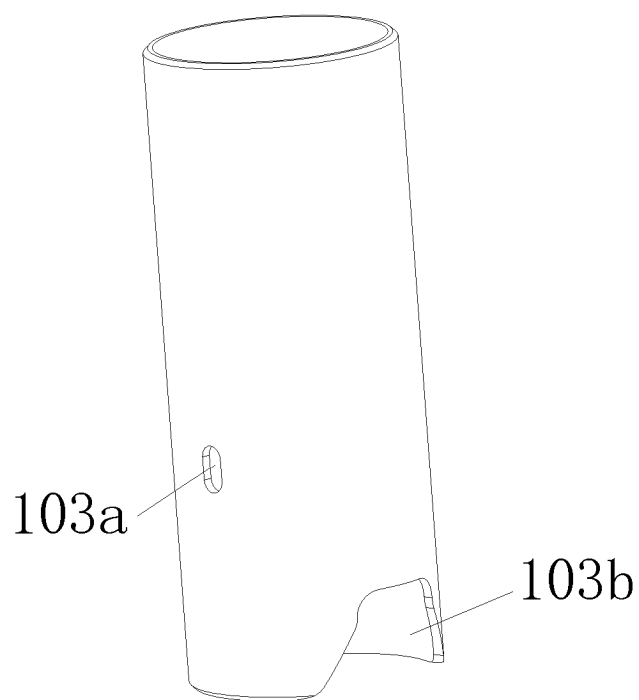


FIG. 8

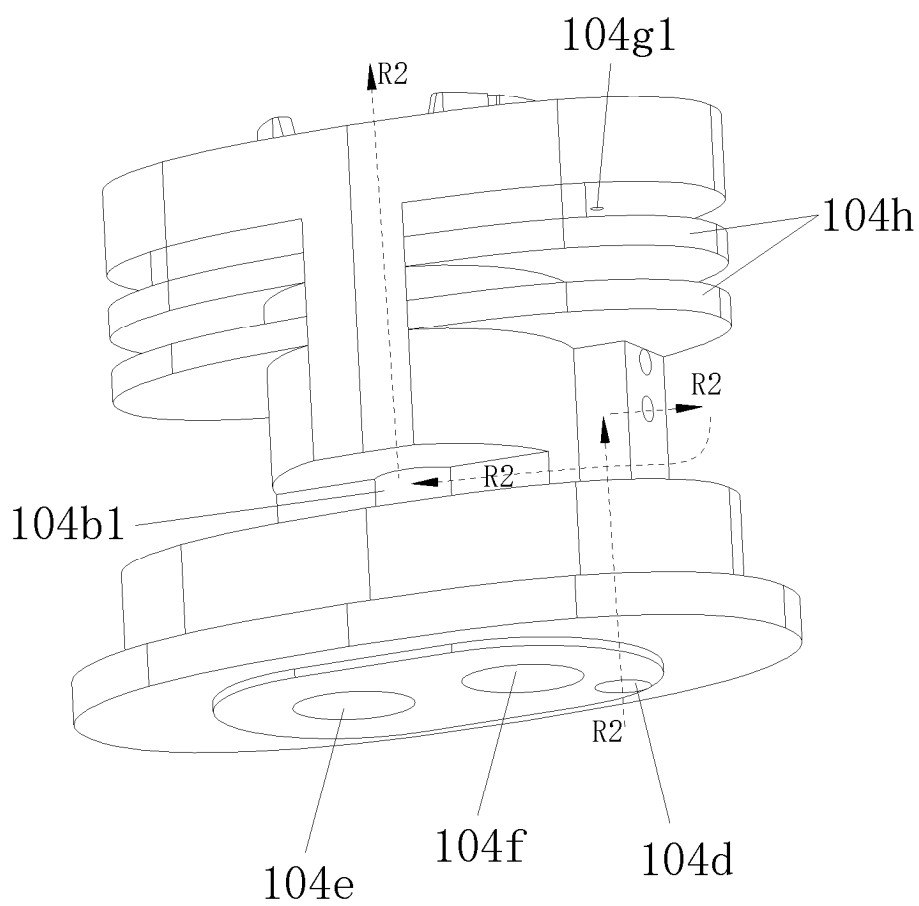


FIG. 9

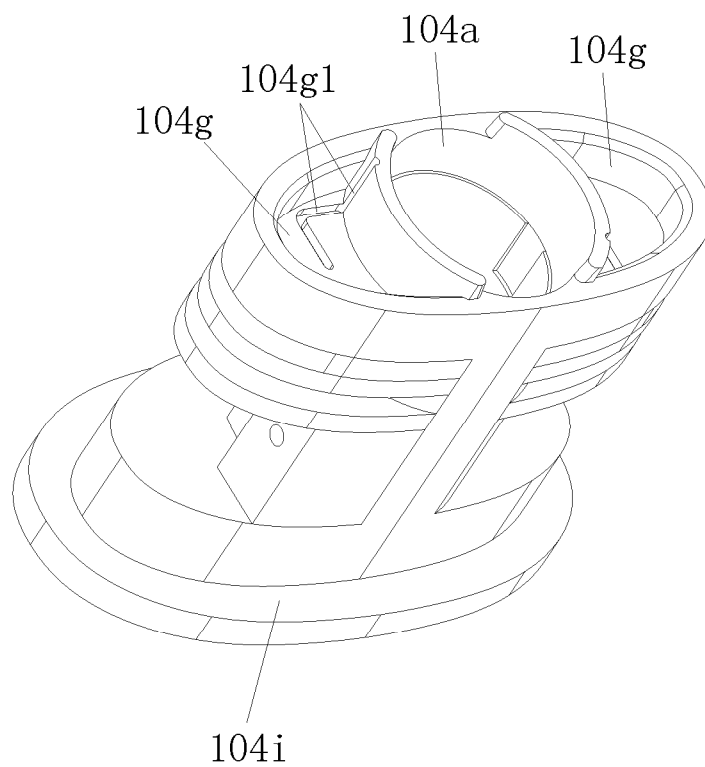


FIG. 10

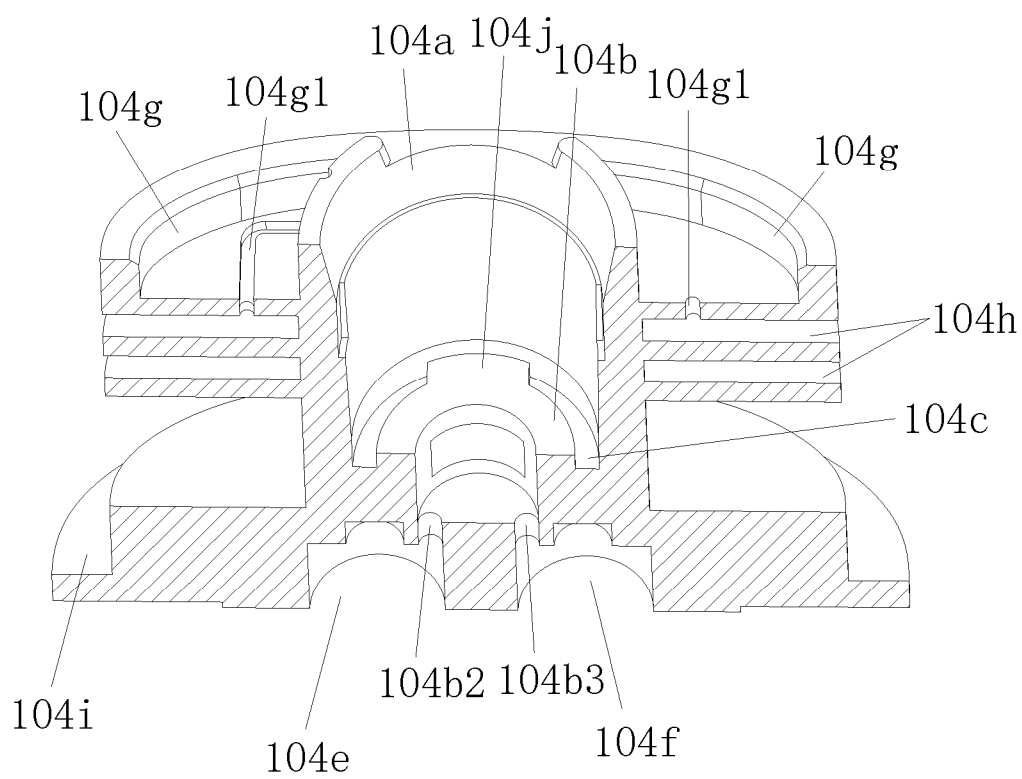


FIG. 11

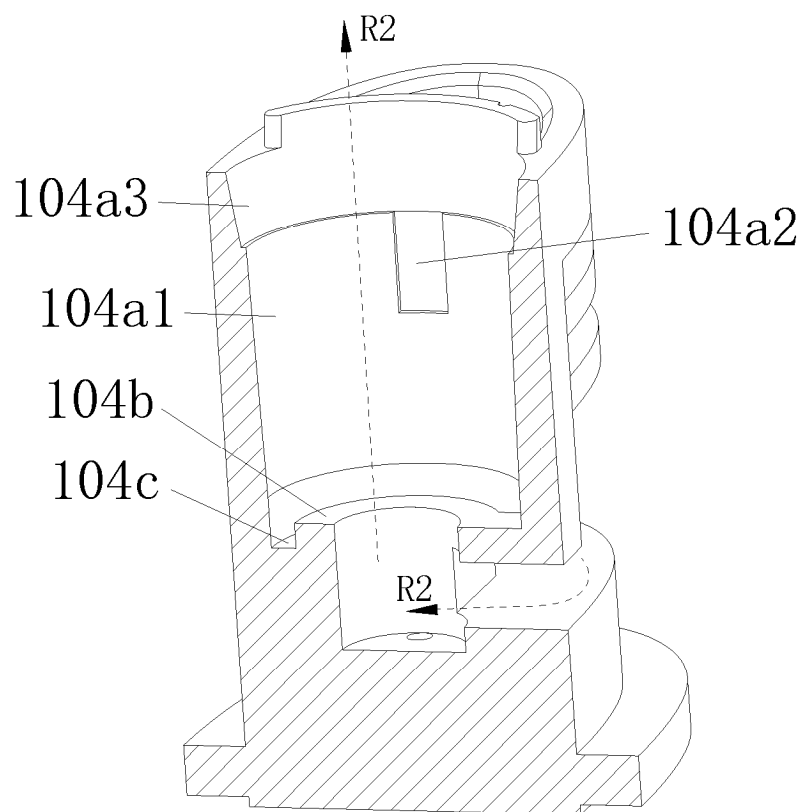


FIG. 12

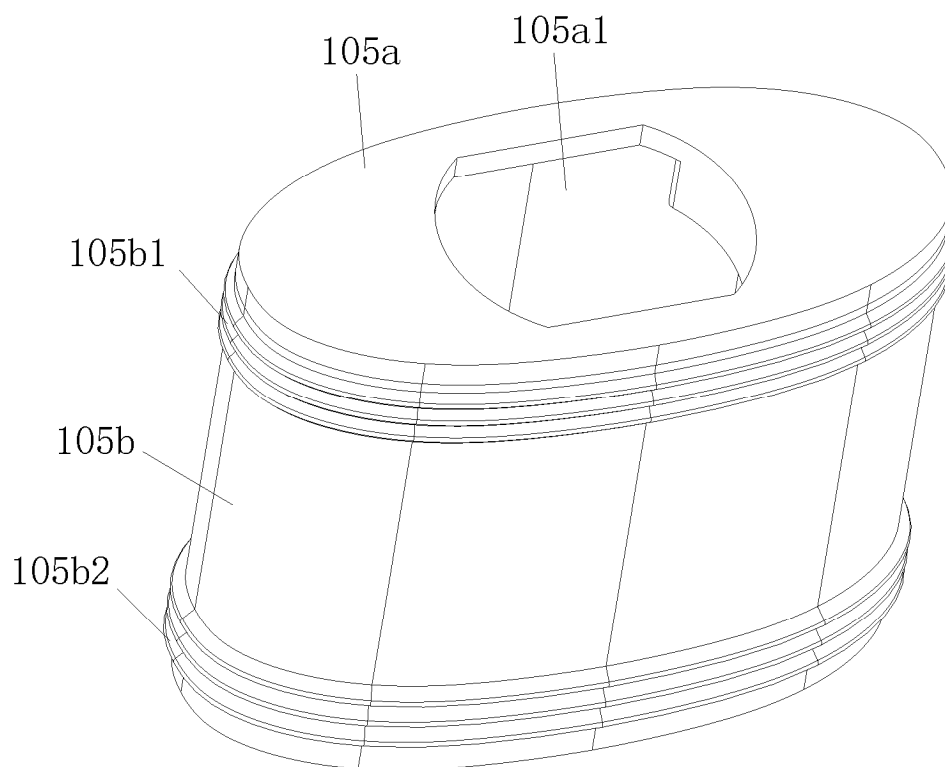


FIG. 13

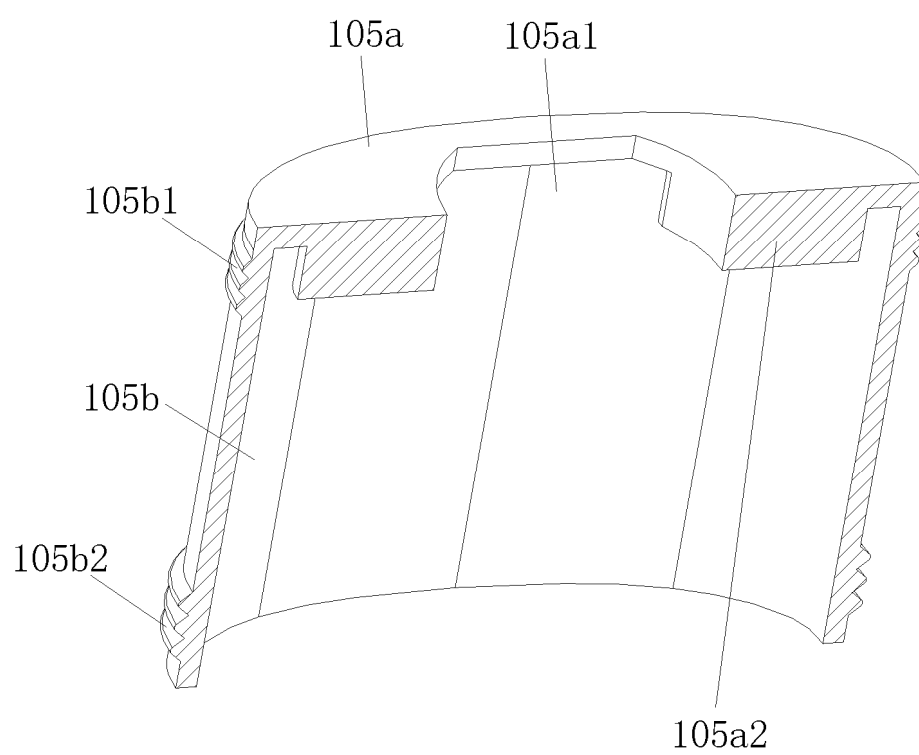


FIG. 14

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2024/124779

A. CLASSIFICATION OF SUBJECT MATTER

A24F40/40(2020.01)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:A24F40/-,A24F47/-,A61M15/-,A61M11/-

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

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

CNABS, CNTXT, CNKI, ENTXT, VEN: 雾化, 气溶胶, 储液, 腔, 基质, 支架, 连接部, 管, 吸嘴, 导液, 界定, 路径, 间隙, 进液槽, 气压, 平衡, 密封, 顶端, 表面, 电源, atomization, aerosol, reservoir, cavity, matrix, scaffold, junction, tube, mouthpiece, liquid, guid+, demarcation, path+, gap, inlet, air pressure, balance+, seal+, tip, surface, power source

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 221284666 U (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 09 July 2024 (2024-07-09) claims 1-15	1-15
X	CN 217446690 U (JOYETECH (SHENZHEN) ELECTRONICS CO., LTD.) 20 September 2022 (2022-09-20) description, paragraphs 50-71, and figures 1-10	1-15
X	CN 218831969 U (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 11 April 2023 (2023-04-11) description, paragraphs 32-85, and figures 1-10	1-15
X	US 2023115358 A1 (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 13 April 2023 (2023-04-13) description, paragraphs 31-45, and figures 1-5	1-15
X	WO 2023020594 A1 (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 23 February 2023 (2023-02-23) description, paragraphs 27-34, and figures 1-5	1-15

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

* Special categories of cited documents:

“A” document defining the general state of the art which is not considered to be of particular relevance

“D” document cited by the applicant in the international application

“E” earlier application or patent but published on or after the international filing date

“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

“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

“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

“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

“&” document member of the same patent family

Date of the actual completion of the international search

16 January 2025

Date of mailing of the international search report

17 January 2025

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.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2024/124779

5

10

15

20

25

30

35

40

45

50

55

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2023134749 A1 (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 20 July 2023 (2023-07-20) description, paragraphs 37-86, and figures 1-18	1-15
A	CN 217429249 U (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 16 September 2022 (2022-09-16) entire document	1-15
A	CN 218737203 U (SHENZHEN YUMI TECHNOLOGY CO., LTD.) 28 March 2023 (2023-03-28) entire document	1-15
A	CN 218978034 U (CHONGQING JIANGTAO TECHNOLOGY CO., LTD.) 09 May 2023 (2023-05-09) entire document	1-15

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/CN2024/124779

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
CN	221284666	U	09 July 2024	None			
CN	217446690	U	20 September 2022	None			
CN	218831969	U	11 April 2023	None			
US	2023115358	A1	13 April 2023	WO	2021179452	A1	16 September 2021
WO	2023020594	A1	23 February 2023	None			
WO	2023134749	A1	20 July 2023	KR	20240132370	A	03 September 2024
				EP	4464179	A1	20 November 2024
CN	217429249	U	16 September 2022	None			
CN	218737203	U	28 March 2023	None			
CN	218978034	U	09 May 2023	None			

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- CN 202311402605 [0001]