



(11) **EP 4 464 179 A1**

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

(43) Date of publication:
20.11.2024 Bulletin 2024/47

(21) Application number: **23740090.8**

(22) Date of filing: **13.01.2023**

(51) International Patent Classification (IPC):
A24F 40/40 ^(2020.01) **A24F 40/10** ^(2020.01)
A24F 40/42 ^(2020.01) **A24F 40/46** ^(2020.01)
A24F 40/90 ^(2020.01) **A24F 40/50** ^(2020.01)

(52) Cooperative Patent Classification (CPC):
A24F 40/05; A24F 40/10; A24F 40/40; A24F 40/42;
A24F 40/46; A24F 40/50; A24F 40/90

(86) International application number:
PCT/CN2023/072126

(87) International publication number:
WO 2023/134749 (20.07.2023 Gazette 2023/29)

(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:
KH MA MD TN

(30) Priority: **13.01.2022 CN 202210034964**
18.01.2022 CN 202210056122

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

(57) Provided in the present application are an atomizer and an electronic atomization device. The atomizer comprises a housing, wherein the housing is internally provided with: a liquid storage cavity for storing a liquid substrate; an elastic sealing member, which at least partially defines the liquid storage cavity, wherein the elastic sealing member is provided with an accommodation cavity, and one end of the elastic sealing member is provided with an opening in communication with the accommodation cavity; and an atomization assembly for atomizing the liquid substrate to generate an aerosol, wherein the atomization assembly can be accommo-

dated in the accommodating cavity via the opening, and part of the outer surface of the atomization assembly is spaced apart from a surface of an inner wall of the elastic sealing member, so as to form an airflow passage. According to the above atomizer, the elastic sealing member is provided with the accommodating cavity for accommodating the atomization assembly, and a side wall of the atomization assembly is spaced apart from the inner wall of the elastic sealing member, so as to form the airflow passage, thereby simplifying the structural design in the atomizer and reducing the costs of the atomizer.

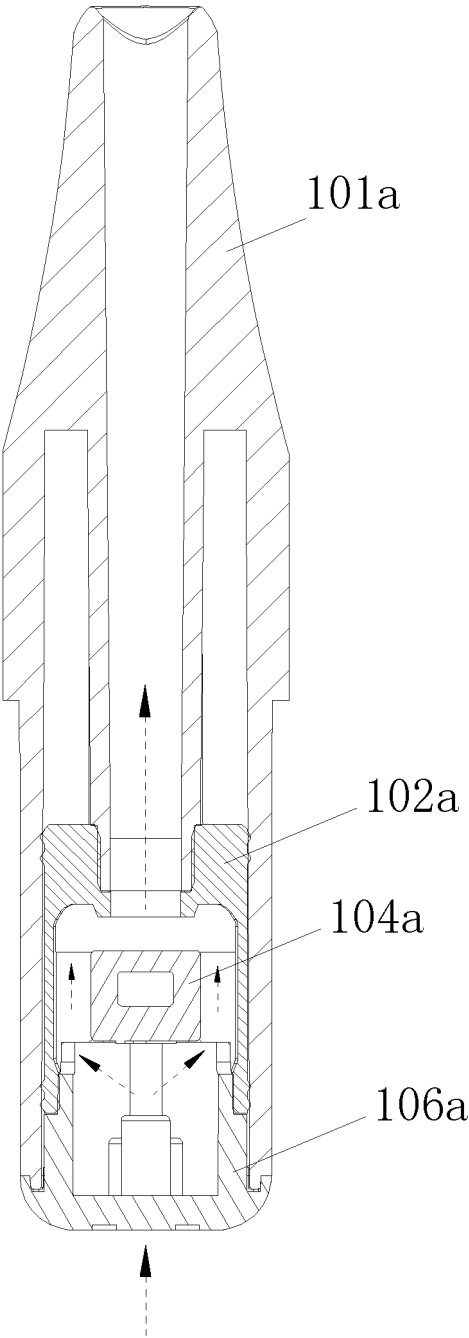


FIG. 6

Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to Chinese Patent Application No. 202210034964.2, filed with the China National Intellectual Property Administration on January 13, 2022 and entitled "ULTRASONIC ATOMIZER AND ULTRASONIC ATOMIZATION DEVICE", and priority to Chinese Patent Application No. 202210056122.7, filed with the China National Intellectual Property Administration on January 18, 2022 and entitled "ATOMIZER AND ELECTRONIC ATOMIZATION DEVICE", which are incorporated herein by reference in their entireties.

TECHNICAL FIELD

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

BACKGROUND

[0003] Tobacco products (such as cigarettes and cigars) burn tobacco during use to produce tobacco smoke. People attempt to make products that release compounds without burning to replace these tobacco-burning products.

[0004] An example of the products is a heating device that releases a compound by heating rather than burning a material. For example, the material may be tobacco or other non-tobacco products, where the non-tobacco products may or may not include nicotine. In another example, there are aerosol-providing articles, for example, electronic atomization devices. These devices usually include liquid that can be atomized, and the liquid is heated to be atomized, to generate an inhalable aerosol.

SUMMARY

[0005] According to an aspect, this application provides an atomizer, including a housing, where the housing is internally provided with:

a liquid storage cavity, for storing a liquid substrate;
an elastic sealing member, at least partially defining the liquid storage cavity, where the elastic sealing member is provided with an accommodating cavity, and one end of the elastic sealing member is provided with an opening in communication with the accommodating cavity; and
an atomization assembly, configured to atomize the liquid substrate to generate an aerosol, where the atomization assembly is capable of being accommodated in the accommodating cavity through the opening, and a part of an outer surface of the atomization assembly is spaced apart from an inner wall surface of the elastic sealing member, to form an

airflow channel.

[0006] According to another aspect, this application provides an electronic atomization device, including a power supply assembly and the foregoing atomizer.

[0007] In the foregoing atomizer, the elastic sealing member is provided with the accommodating cavity for accommodating the atomization assembly, and a side wall of the atomization assembly is spaced apart from an inner wall of the elastic sealing member, to form the airflow channel. This simplifies structural design in the atomizer, and reduces costs of the atomizer.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] One or more embodiments are exemplarily described with reference to the corresponding figures in the accompanying drawings and the descriptions are not to be construed as limiting the embodiments. Components in the accompanying drawings that have same reference numerals are represented as similar components and unless otherwise particularly stated, the figures in the accompanying drawings are not drawn to scale.

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 another electronic atomization device according to an implementation of this application;

FIG. 3 is a schematic diagram of an atomizer according to an implementation of this application;

FIG. 4 is a schematic exploded view of an atomizer according to an implementation of this application;

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

FIG. 6 is another schematic cross-sectional view of an atomizer according to an implementation of this application;

FIG. 7 is a schematic diagram of a liquid guide element in an atomizer according to an implementation of this application;

FIG. 8 is a schematic diagram of a liquid guide element in an atomizer from another perspective according to an implementation of this application;

FIG. 9 is a schematic cross-sectional view of an elastic sealing member in an atomizer according to an implementation of this application;

FIG. 10 is a schematic cross-sectional view of another atomizer according to an implementation of this application;

FIG. 11 is a schematic exploded view of an atomizer according to another implementation of this application;

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

FIG. 13 is another schematic cross-sectional view of an atomizer according to another implementation of this application;

FIG. 14 is a schematic diagram of an elastic sealing member according to another implementation of this application;

FIG. 15 is a schematic diagram of an elastic sealing member from another perspective according to another implementation of this application;

FIG. 16 is a schematic diagram of an ultrasonic atomization piece and a liquid guide element according to another implementation of this application;

FIG. 17 is a schematic diagram of a bottom cap according to another implementation of this application; and

FIG. 18 is a schematic diagram of an elastic sealing member according to still another implementation of this application.

DETAILED DESCRIPTION

[0009] For ease of understanding of this application, this application is described below in more detail 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 another element, or one or more intermediate elements may exist between the element and the another element. When an element is expressed as "being connected to" another element, the element may be directly connected to the another element, or one or more intermediate elements may exist between the element and the another element. The terms "upper", "lower", "left", "right", "inner", "outer", and similar expressions used in this specification are merely used for an illustrative purpose.

[0010] 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 technical field to which this application belongs. The terms used in this specification of this application are merely intended to describe objectives of 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 associated related listed items.

[0011] As used herein, the terms "upstream" and "downstream" describe relative positions of components or part of components in an electronic atomization device in a flow direction of an inhaled airflow.

[0012] FIG. 1 is a schematic diagram of an electronic atomization device according to an implementation of this application.

[0013] As shown in FIG. 1, an electronic atomization device 100 includes an atomizer 10 and a power supply assembly 20. The atomizer 10 and the power supply assembly 20 are undetachable.

[0014] The atomizer 10 is configured to atomize a liquid

substrate to generate an aerosol.

[0015] The power supply assembly 20 includes a battery cell 21 and a circuit 22.

[0016] The battery cell 21 provides power for operating the electronic atomization device 100. The battery cell 21 may be a rechargeable battery cell or a disposable battery cell.

[0017] The circuit 22 may control an overall operation of the electronic atomization device 100. The circuit 22 controls operations of the battery cell 21 and an ultrasonic atomization piece 103, and also controls an operation of another element in the electronic atomization device 100.

[0018] FIG. 2 is a schematic diagram of another electronic atomization device according to an implementation of this application. Different from the example in FIG. 1, the atomizer 10 and the power supply assembly 20 are in a detachable connection, for example, interference fit, snapping, or a magnetic connection.

[0019] FIG. 3 to FIG. 9 are schematic structural diagrams of an atomizer according to an embodiment. In this embodiment, the atomizer includes the following components:

A near end of a main body 101a is provided with a suction nozzle for inhalation; and a vapor output pipe 1011a and a liquid storage cavity A are provided in the main body 101a, where the liquid storage cavity A is provided with an opening located at a far end of the main body 101a.

[0020] A bottom cap 106a is detachably connected to an opening located at the far end of the main body 101a, to define, with the main body 101a, a housing of the atomizer; and an air inlet 106a1 is provided on the bottom cap 106a.

[0021] Referring to FIG. 7 and FIG. 8, a liquid guide element 104a as a whole has a first side wall 104a1 and a second side wall 104a2 that are opposite in a thickness direction, and a notch 104a3 located between the first side wall 104a1 and the second side wall 104a2. The liquid guide element 104a further has an atomization surface 104a7 facing away from the first side wall 104a1 and/or the second side wall 104a2 and/or the notch 104a3 and/or the liquid storage cavity A in a longitudinal direction. In this preferred implementation, the liquid guide element 104a is a rigid porous body, for example, a porous ceramic body.

[0022] A base part 104a4 is located on a lower end side of the liquid guide element 104a in the longitudinal direction, and extends between the first side wall 104a1 and the second side wall 104a2. In addition, an extension length of the base part 104a4 in a length direction of the liquid guide element 104a is the same as an extension length of the first side wall 104a1 and/or the second side wall 104a2. As shown in the figures, a lower surface of the base part 104a4 is configured as the atomization surface 104a7.

[0023] A connection part 104a5 is located on an upper end side of the liquid guide element 104a in the longitudinal direction, and is arranged close to a central portion of the liquid guide element 104a. Similarly, the

connection part 104a5 extends between the first side wall 104a1 and the second side wall 104a2. In addition, an extension length of the connection part 104a5 in the length direction of the liquid guide element 104a needs to be less than the extension length of the first side wall 104a1 and/or the second side wall 104a2 and/or the base part 104a4. In this way, a notch 104a3 is formed by an area uncovered by the connection part 104a5.

[0024] In addition, a space 104a6 extending in the length direction is defined between the connection part 104a5 and the base part 104a4. The space 104a6 may be for receiving or buffering the liquid substrate, to adjust the amount of liquid substrate supplied to the atomization surface 104a7 or efficiency of supplying the liquid substrate to the atomization surface 104a7.

[0025] After assembly, the connection part 104a5 of the liquid guide element 104a is at least partially opposite to the vapor output pipe 1011a in a longitudinal direction of the main body 101a, so that during implementation, a surface of the connection part 104a5 may be for receiving aerosol condensate falling from the vapor output pipe 1011a.

[0026] A heating element 103a is arranged on the atomization surface 104a7 of the liquid guide element 104a to jointly form an atomization assembly, to heat and atomize at least part of the liquid substrate in the liquid guide element 104a to generate an aerosol, which is released by the atomization surface 104a7.

[0027] In a suitable material selection, the elastic sealing member 102a is preferably made of a flexible material. For example, in some examples, the elastic sealing member 102a may be prepared by using a material including silicone, a thermo-plastic-elastomer, or a thermo-plastic-rubber.

[0028] The elastic sealing member 102a includes an upstream end 102a1 (an end away from the liquid storage cavity A), a downstream end 102a2 (an end close to the liquid storage cavity A), and a body 102a3 extending from the upstream end 102a1 to the downstream end 102a2. A sleeve portion (not shown) located between the upstream end 102a1 and an accommodating cavity 102a4 is at least partially clamped between an inner wall of the main body 101a and an outer side wall of the bottom cap 106a. The downstream end 102a2 is in contact with the inner wall of the main body 106a to form a seal and define at least part of the liquid storage cavity A.

[0029] In a preferred implementation, a first convex rib (not shown) is provided on an outer side wall of the body 102a3 close to the upstream end 102a1, and a second convex rib (not shown) is provided on an outer side wall of the body 102a3 close to the downstream end 102a2. A good sealing effect can be formed by using the first convex rib and the second convex rib.

[0030] The accommodating cavity 102a4 and a liquid channel 102a5 are provided in the body 102a3. The downstream end 102a2 is provided with an opening, and the accommodating cavity 102a4 is exposed to the opening, that is, the accommodating cavity 102a4

is in communication with the opening. The atomization assembly may be assembled or accommodated in the accommodating cavity 102a4 through the opening located at the downstream end 102a2, and the liquid channel 102a5 is in communication with the accommodating cavity 102a4 and the liquid storage cavity A, so that the liquid substrate may be transferred to the liquid guide element 104a through the liquid channel 102a5.

[0031] In a preferred implementation, another liquid guide element (not shown), for example, liquid guide cotton, may be arranged in the liquid channel 102a5, to prevent the liquid substrate from directly flowing to or being transferred to the liquid guide element 104a quickly, which plays a role of adjusting a rate of transfer of the liquid substrate to the liquid guide element 104a. In a further preferred implementation, still another liquid guide element (not shown), for example, hard organic cotton, may be arranged on the elastic sealing member 102a. The hard organic cotton plays a role of substantially sealing the opening of the liquid storage cavity A, to prevent the liquid substrate from directly flowing out of the opening, so that the liquid substrate in the liquid storage cavity A can slowly permeate and leave only through the liquid guide element, and then is transferred to the liquid guide element 104a through the liquid channel 102a5.

[0032] A part of an outer surface of the liquid guide element 104a is in contact with an inner wall (or an inner wall surface) of the accommodating cavity 102a4, to prevent the liquid substrate from flowing toward the bottom cap 106a through the liquid channel 102a5, to provide a seal between the liquid storage cavity A and an airflow channel.

[0033] In a preferred implementation, a width dimension of the liquid guide element 104a is larger than a width dimension of the accommodating cavity 102a4, and/or a thickness dimension of the liquid guide element 104a is larger than a thickness dimension of the accommodating cavity 102a4. In this way, the liquid guide element 104a is in interference fit with the accommodating cavity 102a4, so that the liquid guide element 104a can be retained in the accommodating cavity 102a4.

[0034] In a further preferred implementation, a third convex rib (not shown) is provided on an outer side wall of the body 102a3 that forms or defines the accommodating cavity 102a4. The third convex rib is located between the first convex rib and the second convex rib. The third convex rib can form a good sealing effect between the elastic sealing member 102a and the inner wall of the main body 101a, and can also avoid an excessively large tolerance of the elastic sealing member 102a, to form a good sealing effect between the elastic sealing member 102a and the liquid guide element 104a.

[0035] An aerosol channel 102a6 is further provided in the body 102a3. A downstream end of the aerosol channel 102a6 is connected to the vapor output pipe 1011a. Specifically, the vapor output pipe 1011a is inserted into the aerosol channel 102a6, the aerosol channel 102a6 is

provided with a step to abut against an end portion of the vapor output pipe 1011a, and an inner wall of the aerosol channel 102a6 is in contact with a side wall of the vapor output pipe 1011a to form a seal. In an example of FIG. 3 to FIG. 10, an upstream end of the aerosol channel 102a6 is an open end (that is, is in communication with the accommodating cavity 102a4), and abuts against the connection part 104a5. Certainly, the upstream end of the aerosol channel 102a6 may alternatively be a closed end and abut against the connection part 104a5.

[0036] In another example, as shown in FIG. 10, the liquid guide element may be a plate-shaped porous body 104b, where the plate-shaped porous body 104b has a first surface facing the liquid storage cavity A and a second surface facing away from the liquid storage cavity A, and the heating element 103a is arranged on the second surface; and the upstream end of the aerosol channel 102a6 is a closed end (that is, is separated from the accommodating cavity 102a4), and is spaced apart from the first surface. A gap is provided between the closed end and the first surface of the porous body 104b. In some implementations, a laterally extending groove (not shown) is provided on a surface of the closed end opposite to the first surface of the porous body 104b, and the groove forms the gap. In this way, the liquid substrate can be transferred to a middle part of the porous body 104b through the gap between the closed end and the porous body 104b (which is shown by arrows in FIG. 10), to avoid a problem of dry burning caused by insufficient liquid supply.

[0037] In another example, the atomization surface of the liquid guide element, that is, the surface on which the heating element is combined, faces the liquid storage cavity A, and a liquid absorbing surface faces away from the liquid storage cavity A. In this way, the atomization surface is closer to the aerosol channel than the liquid absorbing surface. In this case, the upstream end of the aerosol channel may be an open end, and is in fluid communication with the atomization surface of the liquid guide element.

[0038] A part of the outer surface of the liquid guide element 104a is spaced apart from an inner wall surface of the elastic sealing member 102a, to form the airflow channel. The airflow channel includes a first airflow channel adjacent to one side surface of the liquid guide element 104a and a second airflow channel adjacent to the other side surface of the liquid guide element 104a. Specifically, In the example of FIG. 3 to FIG. 10, in the thickness direction, gaps are remained between the first side wall 104a1 of the liquid guide element 104a and the inner wall of the elastic sealing member 102a, and between the second side wall 104a2 of the liquid guide element 104a and the inner wall of the elastic sealing member 102a, to form the first airflow channel and the second airflow channel respectively. During inhalation, after air enters an atomization cavity defined by the atomization surface 104a7, the aerosol is carried to cross the liquid guide element 104a or the accommodating

cavity 102a4 through the airflow channel (that is, the aerosol flows through side surfaces between upper and lower surfaces of the liquid guide element 104a), and then is output to the aerosol channel 102a6 at the central portion close to the vapor output pipe 1011a, to be output to the vapor output pipe 1011a. In a preferred implementation, the inner wall (or the inner wall surface) of the elastic sealing member 102a is provided with a groove 102a7, to define the airflow channel with the first side wall 104a1 or the second side wall 104a2. One end of the groove 102a7 is arranged close to the upstream end 102a1 of the elastic sealing member 102a, and the other end of the groove 102a7 extends in the longitudinal direction of the main body 101a and crosses the liquid guide element 104a or the accommodating cavity 102a4. It can be seen from the figure that, the inner wall of the elastic sealing member 102a is provided with two correspondingly arranged grooves 102a7. In this way, each groove 102a7 forms an airflow channel with the side surface of the liquid guide element 104a.

[0039] Further referring to FIG. 9, an airflow groove 102a8 is provided in the elastic sealing member 102a. The airflow groove 102a8 is arranged along the accommodating cavity 102a4 and the liquid channel 102a5 to form an air pressure balancing channel. The air entering the atomization cavity may flow into the liquid storage cavity A through the airflow groove 102a8, to alleviate a negative pressure in the liquid storage cavity A.

[0040] One end of the first electrode 107a is in contact with one electrical connection portion of the heating element 103a to form an electrical connection, and the other end of the first electrode 107a is exposed on the bottom cap 106a. One end of the second electrode 108a is in contact with the other electrical connection portion of the heating element 103a to form an electrical connection, and the other end of the second electrode 108a is exposed on the bottom cap 106a. The first electrode 107a and the second electrode 108a are further configured to support the atomization assembly to retain the atomization assembly in the accommodating cavity.

[0041] FIG. 11 to FIG. 17 are schematic structural diagrams of an atomizer 10 according to another embodiment. In this embodiment, the atomizer 10 includes the following components:

A main body 101 is generally in a flat cylindrical shape. The main body 101 has a near end and a far end that are opposite in a length direction. The near end is configured as one end for a user to inhale aerosols, and a suction nozzle for the user to inhale is arranged at the near end. The far end is used as an end combined with a power supply assembly 20, and the far end of the main body 101 is an opening on which a detachable bottom cap 106 is mounted. For example, the bottom cap 106 and the main body 101 are in a buckle connection. After the main body 101 is connected to the bottom cap 106, the main body 101 and the bottom cap 106 jointly define a housing of the atomizer 10, and the interior of the housing is hollow and is provided with necessary functional components con-

figured to store and atomize a liquid substrate. Through the opening of the main body 101, the necessary functional components may be mounted in the interior of the housing of the atomizer 10.

[0042] It is understood with reference to FIG. 17 that, a first electrode hole 1061 and a second electrode hole 1062 are provided on the bottom cap 106, and a first electrode 107 and a second electrode 108 are mounted in a one-to-one correspondence. The first electrode 107 and the second electrode 108 are preferably elastic electrodes. Through the first electrode 107 and the second electrode 108, the atomizer 10 may form an electrical connection with the power supply assembly 20. In addition, an air inlet 1063 is further provided on the bottom cap 106, to supply external air into the atomizer 10 during inhalation. A collection cavity 1064 is further provided on the bottom cap 106. The first electrode hole 1061, the second electrode hole 1062, and the air inlet 1063 all protrude from the collection cavity 1064. The collection cavity 1064 is for collecting a leaked liquid substrate, to prevent the leaked liquid substrate from flowing to the power supply assembly 20. A side wall of the bottom cap 106 is provided with a step 1065, which is described below.

[0043] The interior of the housing is provided with a liquid storage cavity A for storing a liquid substrate, an elastic sealing member 102, an ultrasonic atomization piece 103 configured to ultrasonically atomize the liquid substrate, a liquid guide element 104 configured to absorb the liquid substrate, and a liquid guide element 105 configured to absorb the liquid substrate from the liquid storage cavity A and transfer the liquid substrate to the liquid guide element 104.

[0044] A vapor transmission pipe 1011 is arranged in an axial direction in the main body 101, and a space among an outer wall of the vapor transmission pipe 1011, an inner wall of the main body 101, and a first end portion of the elastic sealing member 102 defines the liquid storage cavity A for storing the liquid substrate. One end of the vapor transmission pipe 1011 is in communication with a suction nozzle, to transfer a generated aerosol to the suction nozzle for inhalation. In a preferred implementation, the vapor transmission pipe 1011 and the main body 101 are integrally molded by using a moldable material, so that the liquid storage cavity A formed after preparation is open toward the far end of the main body 101.

[0045] It is understood with reference to FIG. 14 and FIG. 15 that, the elastic sealing member 102 has a first end portion 1021 and a second end portion 1022 that are opposite in a longitudinal direction of the main body 101. The elastic sealing member 102 is preferably made of a flexible material such as silicone or a thermo-plastic-elastomer.

[0046] Close to the second end portion 1022, an accommodating cavity 1023 for accommodating the ultrasonic atomization piece 103 is further provided in the elastic sealing member 102. The liquid guide element

104 is combined on a part of an upper surface of the ultrasonic atomization piece 103, and is accommodated in the accommodating cavity 1023 together with the ultrasonic atomization piece 103. In an alternative implementation, one part of the liquid guide element 104 is combined on one part of the upper surface of the ultrasonic atomization piece 103, and the other part of the liquid guide element 104 is clamped between the other part of the upper surface of the ultrasonic atomization piece 103 and an abutting portion 1024. The abutting portion 1024 is provided in the accommodating cavity 1023. The part of the upper surface 1033 of the ultrasonic atomization piece 103 on which the liquid guide element 104 is not combined is in contact with and elastically abuts against the abutting portion 1024. An inner wall of the accommodating cavity 1023 is in contact with a side wall (extending from an upper surface to a lower surface) of the ultrasonic atomization piece 103. In this way, a good sealing effect can be formed between the elastic sealing member 102 and the ultrasonic atomization piece 103. An area of the part of the upper surface 1033 on which the liquid guide element 104 is not combined is much smaller than an area of the part of the upper surface on which the liquid guide element 104 is combined. The part of the upper surface 1033 on which the liquid guide element 104 is not combined is arranged next to the side wall of the ultrasonic atomization piece 103. Due to the elastic abutment between the abutting portion 1024 and the ultrasonic atomization piece 103, during high-frequency vibration of the ultrasonic atomization piece 103, the vibration can be buffered through elasticity of the ultrasonic atomization piece 103, thereby avoiding damage to the ultrasonic atomization piece 103.

[0047] A pair of liquid channels 1025 are symmetrically arranged in a lateral direction of the main body 101. The liquid channels 1025 extend from the first end portion to an accommodating cavity 1023. The liquid substrate in the liquid storage cavity A is transferred to the liquid guide element 104 through the liquid channels 1025, and is then atomized into the aerosol under high-frequency vibration generated by the ultrasonic atomization piece 103. For a transfer path of the liquid substrate, refer to R1 in FIG. 12. As shown in FIG. 15, ports of lower ends (liquid output ends) of the liquid channels 1025 and the abutting portion 1024 are arranged in a step-like manner; the part of the upper surface 1033 on which the liquid guide element 104 is not combined is offset or misplaced from the ports of the lower ends of the liquid channels 1025; and the liquid guide element 104 covers the ports of the lower ends of the liquid channels 1025.

[0048] In an optional embodiment, the liquid guide element 105 is arranged in the liquid channel 1025, to absorb the liquid substrate from the liquid storage cavity A and transfer the liquid substrate to the liquid guide element 104. The liquid guide element 104 absorbs the liquid substrate from the liquid guide element 105, so that oil frying caused when the liquid substrate is excessively or quickly transferred to the ultrasonic ato-

mization piece 103 can be avoided. In an alternative embodiment, the liquid guide element 105 and the liquid guide element 104 may be integrally formed.

[0049] In another optional embodiment, the liquid guide element 105 may be arranged between the elastic sealing member 102 and the liquid storage cavity A. In this way, the liquid guide element 105 absorbs the liquid substrate from the liquid storage cavity A and transfers the liquid substrate to the liquid guide element 104 through the liquid channel 1025.

[0050] An aerosol channel 1026 formed through the hollow is further included between the pair of liquid channels 1025, that is, the aerosol channel 1026 extends from the first end portion to the accommodating cavity 1023. The other end of the vapor transmission pipe 1011 is inserted into the aerosol channel 1026. One end of the aerosol channel 1026 is in contact with the liquid guide element 104, so that the liquid guide element 104 abuts against a part of the upper surface of the ultrasonic atomization piece 103. An inner wall of the aerosol channel 1026 and the upper surface of the ultrasonic atomization piece 103 define at least part of an atomization cavity. Airflow guide portions 1027 are arranged symmetrically in a thickness direction of the main body 101. The one end of the aerosol channel 1026 is recessed to form airflow grooves (not shown) in communication with the airflow guide portions 1027. In this way, during inhalation (referring to R2 in FIG. 13), after the external air enters the atomizer 10 through the air inlet 1063, the external air flows, in a redirected manner, into the aerosol channel 1026 along the airflow guide portions 1027 and the airflow grooves, and flows into the vapor transmission pipe 1011 together with the aerosol formed through ultrasonic atomization, to be inhaled by the user. Further, the airflow guide portions 1027 are further provided with airflow guide surfaces (not shown) inclined relative to the horizontally arranged liquid guide element 104 or the upper surface of the ultrasonic atomization piece 103, so that airflows after deflection may flow into the aerosol channel 1026 at a preset angle.

[0051] A side wall of the elastic sealing member 102 abuts against the inner wall of the main body 101, to form a seal. Further, a protrusion 1028 and a protrusion 1029 are provided on the side wall of the elastic sealing member 102. The protrusion 1028 is arranged close to the first end portion, and the protrusion 1029 is arranged close to the second end portion. In this way, a better sealing effect can be formed through the protrusion 1028 and the protrusion 1029.

[0052] A step 1020 is further provided between the accommodating cavity 1023 and the second end portion 1022.

[0053] After assembly, the second end portion 1022 abuts against the step 1065 of the bottom cap 106, and is clamped between the side wall of the bottom cap 106 and the inner wall of the main body 101, and the step 1020 abuts against an upper end surface of the bottom cap 106. In this way, a good sealing effect can be formed

between the elastic sealing member 102 and the bottom cap 106.

[0054] It is understood with reference to FIG. 16 that, different from a conventional circular ultrasonic atomization piece, the ultrasonic atomization piece 103 is generally strip-shaped. The liquid guide element 104 is combined on a part of the upper surface of the ultrasonic atomization piece 103. A first electrical connection portion 1031 and a second electrical connection portion 1032 are formed on a lower surface of the ultrasonic atomization piece 103, where the first electrical connection portion 1031 is arranged next to a right end of the ultrasonic atomization piece 103, and the second electrical connection portion 1032 is arranged next to a left end of the ultrasonic atomization piece 103. After assembly, one end of a first electrode 107 is exposed on the bottom cap 106, and the other end of the first electrode 107 is in contact with the first electrical connection portion 1031 to form an electrical connection; one end of a second electrode 108 is exposed on the bottom cap 106, and the other end of the second electrode 108 is in contact with the second electrical connection portion 1032 to form an electrical connection; and the ends of the electrodes exposed on the bottom cap 106 are electrically connected to electrical contacts (not shown) on the power supply assembly 20. The first electrode 107 and the second electrode 108 simultaneously support the lower surface of the ultrasonic atomization piece 103, to retain the ultrasonic atomization piece 103 in the accommodating cavity 1023. In a preferred implementation, projections of the first electrical connection portion 1031 and the second electrical connection portion 1032 on the upper surface of the ultrasonic atomization piece 103 at least partially overlap with the part of the upper surface 1033 on which the liquid guide element 104 is not combined. In this way, through the abutment of the abutting portion 1024 and the support of the electrodes, the ultrasonic atomization piece 103 can be retained in the accommodating cavity 1023.

[0055] It should be noted that, in other examples, the first electrical connection portion 1031 and the second electrical connection portion 1032 may alternatively be arranged on different surfaces. For example, the first electrical connection portion 1031 is arranged on the lower surface of the ultrasonic atomization piece 103, and the second electrical connection portion 1032 is arranged on the upper surface of the ultrasonic atomization piece 103. In a further implementation, the second electrical connection portion 1032 may alternatively extend to the lower surface along the side wall, to be arranged on the same surface as the first electrical connection portion 1031.

[0056] It should be noted that, in other examples, the ultrasonic atomization piece 103 may alternatively be supported by any one of the first electrode 107 and the second electrode 108.

[0057] The liquid guide element 104 is prepared by using a flexible strip or rod-shaped fiber material, for

example, cotton fiber, non-woven fiber, or sponge.

[0058] The liquid guide element 105 is prepared by using an organic porous material having elasticity, and exhibits moderate flexibility and rigidity. During implementation, the liquid guide element 105 has elastic modulus or stiffness that is less than that of the main body 101 or the material defining the liquid storage cavity A, and greater than that of the material of the liquid guide element 104. Specifically, the liquid guide element 105 is made of hard artificial wool with a Shore hardness of 20 to 70 A. In an optional implementation, the liquid guide element 105 is made of hard artificial wool including oriented polyester fiber, hard artificial wool or artificial foam made of filiform polyurethane, or the like.

[0059] FIG. 18 is a schematic structural diagram of an elastic sealing member 102a according to another embodiment. Different from the elastic sealing member 102a shown in FIG. 9, the air pressure balancing channel includes an airflow groove 102a81 arranged on the inner wall of the accommodating cavity 102a4, and a through hole 102a82. The through hole 102a82 extends longitudinally from the downstream end 102a2 to the accommodating cavity 102a4, and is physically separated from the liquid channel 102a5. In this way, the air entering the atomization cavity may flow into the liquid storage cavity A through the airflow groove 102a81 and the through hole 102a82, to alleviate a negative pressure in the liquid storage cavity A. After the liquid guide element 104a is assembled on the elastic sealing member 102a, a part of the outer surface of the liquid guide element 104a is in contact with the inner wall (or the inner wall surface) of the accommodating cavity 102a4, so that the air pressure balancing channel is completely physically separated from the liquid channel 102a5. In this way, air bubbles formed by entering of external air from the air pressure balancing channel can directly escape into the liquid storage cavity A. This can avoid a problem that the liquid substrate unsmoothly flows through the liquid channel 102a5 when the air bubbles are collected in the liquid channel 102a5.

[0060] It should be noted that, the air pressure balancing channel is not limited to the two cases in FIG. 9 and FIG. 18. In other examples, the air pressure balancing channel may alternatively extend from the downstream end 102a2 to the groove 102a7 or the aerosol channel 102a6, which may be in a manner of grooving or providing a through hole. The air pressure balancing channel may alternatively be partially arranged between the elastic sealing member 102a and the main body 101a.

[0061] It should be noted that, the specification of this application and the accompanying drawings thereof illustrate preferred embodiments of this application. However, this application may 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 content disclosed in this application.

Moreover, the foregoing technical features are further combined to form various embodiments not listed above, and all such embodiments shall be construed as falling within the scope of this application. Further, a person of ordinary skill in the art may make improvements or variations according to 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 housing, wherein the housing is internally provided with:

a liquid storage cavity, for storing a liquid substrate;

an elastic sealing member, at least partially defining the liquid storage cavity, wherein the elastic sealing member is provided with an accommodating cavity, and one end of the elastic sealing member is provided with an opening in communication with the accommodating cavity; and

an atomization assembly, configured to atomize the liquid substrate to generate an aerosol, wherein

the atomization assembly is capable of being accommodated in the accommodating cavity through the opening, and a part of an outer surface of the atomization assembly is spaced apart from an inner wall surface of the elastic sealing member, to form an airflow channel.

2. The atomizer according to claim 1, wherein the atomization assembly comprises a liquid guide element, wherein the liquid guide element has a first surface and a second surface that are opposite, and the airflow channel is configured to cause the aerosol to flow through side surfaces of the liquid guide element located between the first surface and the second surface.

3. The atomizer according to claim 2, wherein the airflow channel comprises a first airflow channel adjacent to one side surface of the liquid guide element and a second airflow channel adjacent to an other side surface of the liquid guide element.

4. The atomizer according to claim 2, wherein the liquid guide element is rigid.

5. The atomizer according to any one of claims 1 to 4, wherein the inner wall surface of the elastic sealing member for defining the accommodating cavity is provided with a groove, to define the airflow channel with the part of the outer surface of the atomization

assembly.

6. The atomizer according to claim 1, wherein a part of the outer surface of the atomization assembly is in contact with an inner wall surface of the accommodating cavity, to provide a seal between the liquid storage cavity and the airflow channel.
7. The atomizer according to claim 1, wherein a width dimension of the atomization assembly is larger than a width dimension of the accommodating cavity, and/or a thickness dimension of the atomization assembly is larger than a thickness dimension of the accommodating cavity.
8. The atomizer according to claim 1, wherein the elastic sealing member further comprises an aerosol channel, wherein an upstream end of the aerosol channel abuts against or is spaced apart from the atomization assembly, and a downstream end of the aerosol channel is connected to a vapor output pipe in the housing.
9. The atomizer according to claim 1, wherein the atomizer further comprises an air pressure balancing channel at least partially located between the elastic sealing member and the atomization assembly, wherein the air pressure balancing channel is in communication with the liquid storage cavity to replenish air into the liquid storage cavity.
10. The atomizer according to claim 9, wherein the elastic sealing member further comprises a liquid channel in communication with the accommodating cavity and the liquid storage cavity, the air pressure balancing channel comprises an airflow groove arranged on an inner wall of the accommodating cavity, and the airflow groove extends into the liquid channel to be in communication with the liquid storage cavity through the liquid channel.
11. The atomizer according to claim 9, wherein the elastic sealing member further comprises a liquid channel in communication with the accommodating cavity and the liquid storage cavity; and the air pressure balancing channel comprises an airflow groove arranged on an inner wall of the accommodating cavity and a through hole physically separated from the liquid channel.
12. The atomizer according to claim 1, wherein the elastic sealing member further comprises a liquid channel in communication with the accommodating cavity and the liquid storage cavity.
13. The atomizer according to claim 1, further comprising an electrode electrically connected to the atomization assembly, wherein one end of the electrode is

exposed on the housing, and an other end of the electrode is in contact with the atomization assembly to support the atomization assembly.

14. The atomizer according to claim 1, wherein the housing comprises a main body and a bottom cap detachably connected to the main body, the elastic sealing member comprises a sleeve portion, and the sleeve portion is clamped between an inner wall of the main body and an outer side wall of the bottom cap.
15. The atomizer according to claim 1, wherein the atomization assembly comprises a liquid guide element and an atomization element, wherein the atomization element is combined on a surface of the liquid guide element closer to the liquid storage cavity.
16. The atomizer according to claim 15, wherein the atomization element comprises a heating element or an ultrasonic atomization piece.
17. An electronic atomization device, comprising a power supply assembly and the atomizer according to any one of claims 1 to 16.

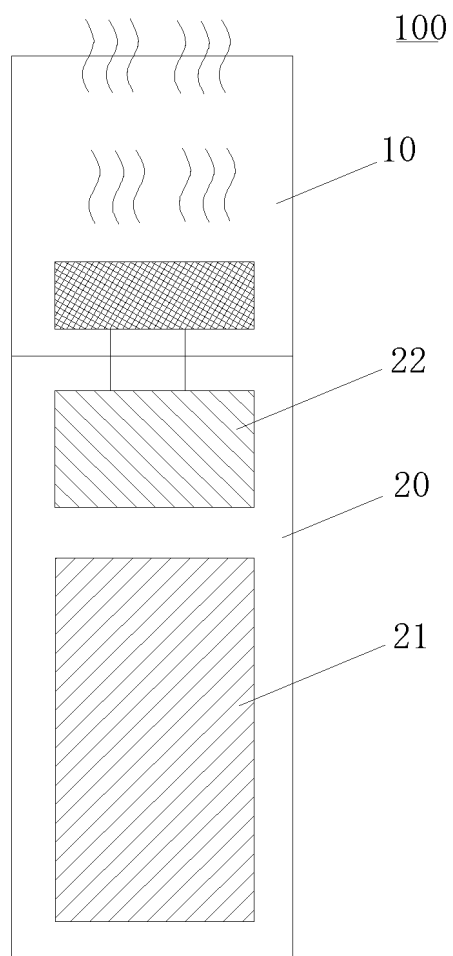


FIG. 1

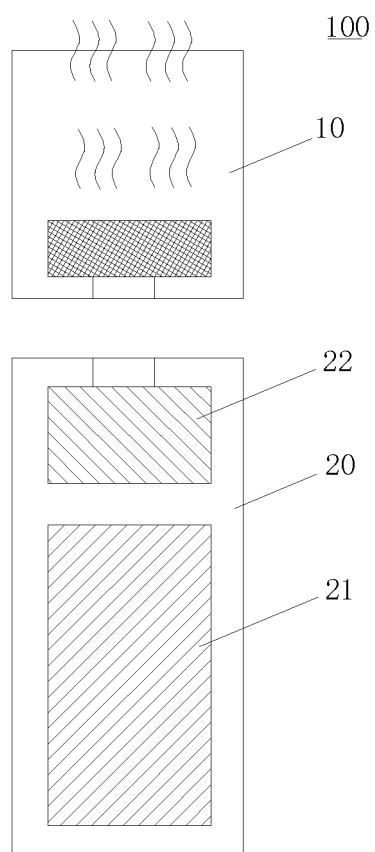


FIG. 2

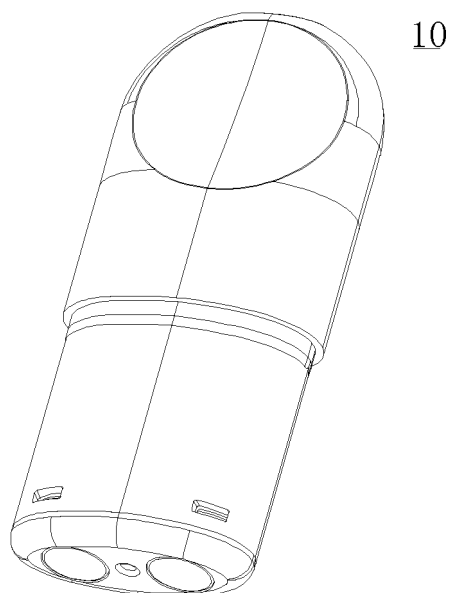


FIG. 3

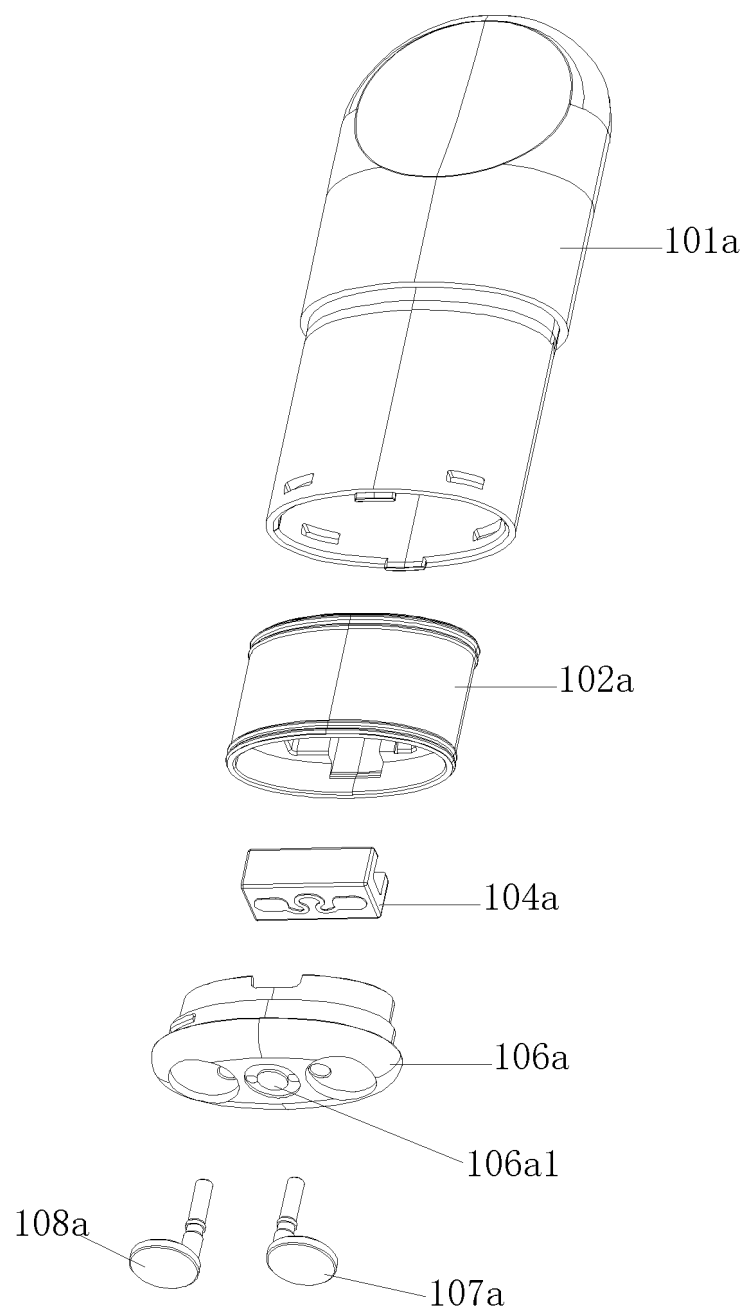


FIG. 4

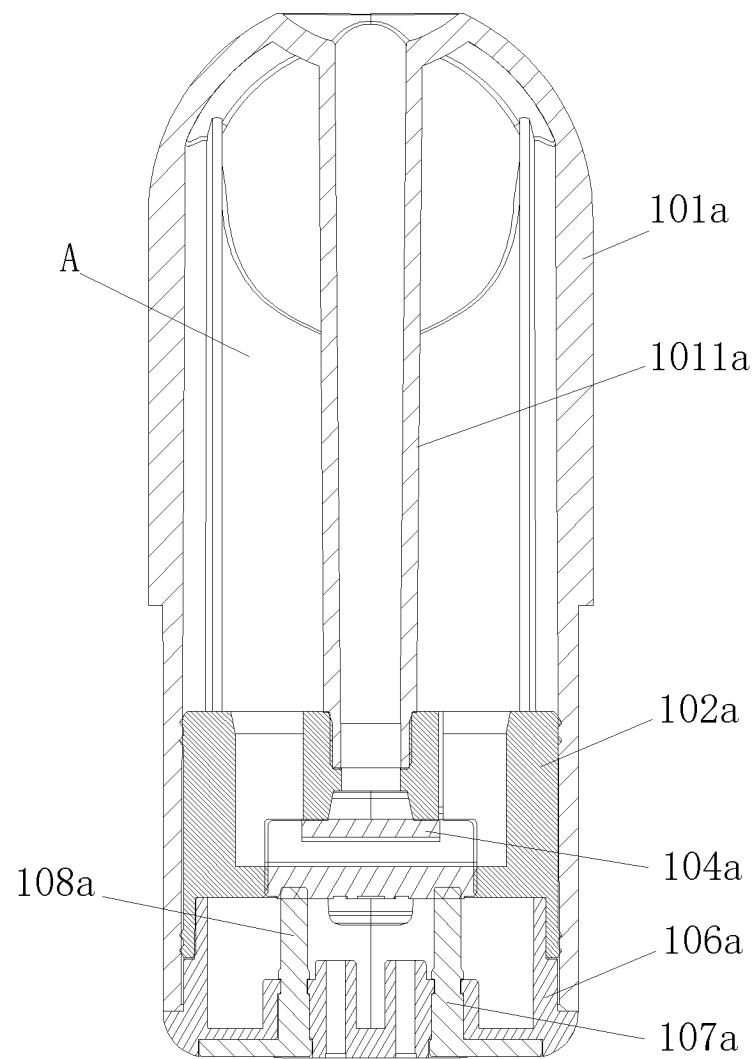


FIG. 5

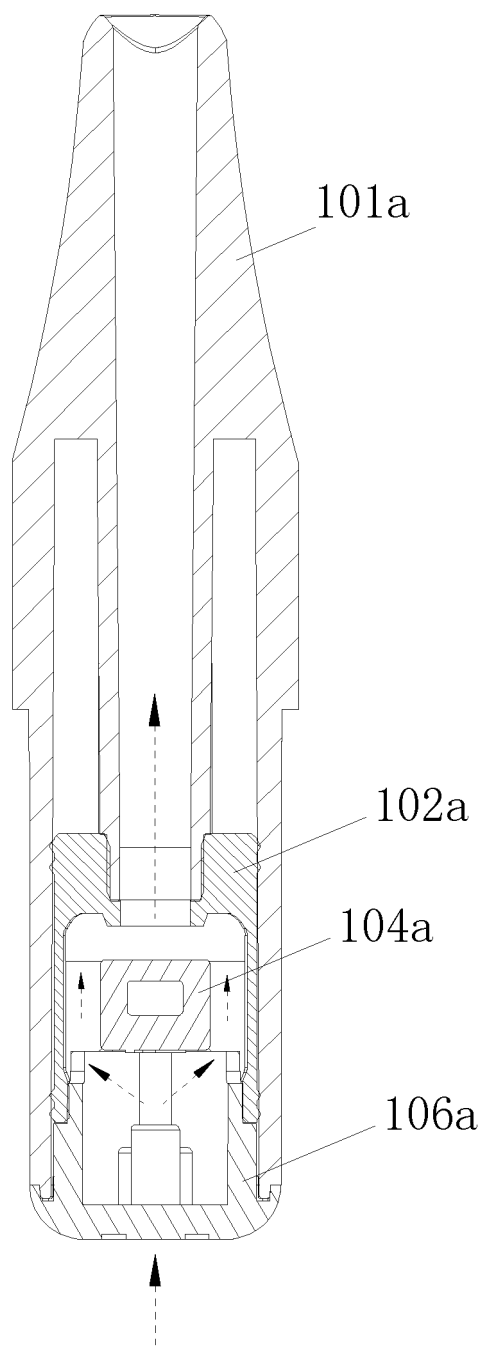


FIG. 6

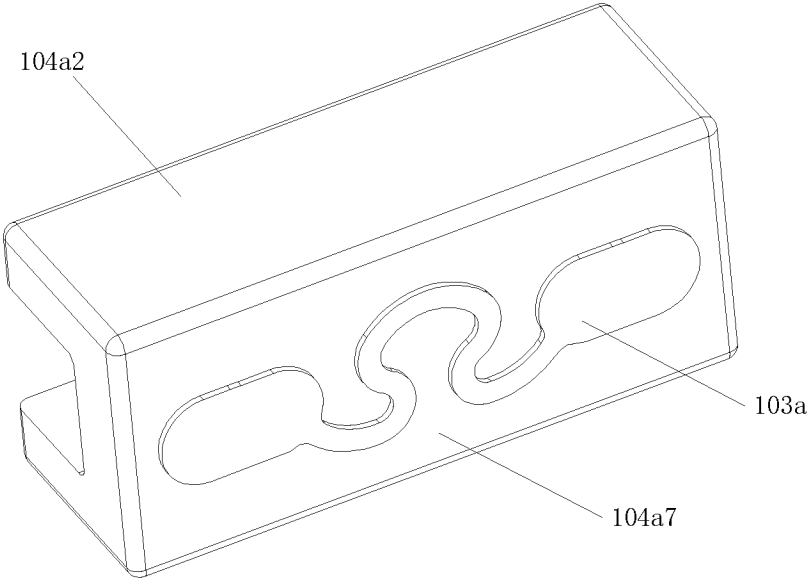


FIG. 7

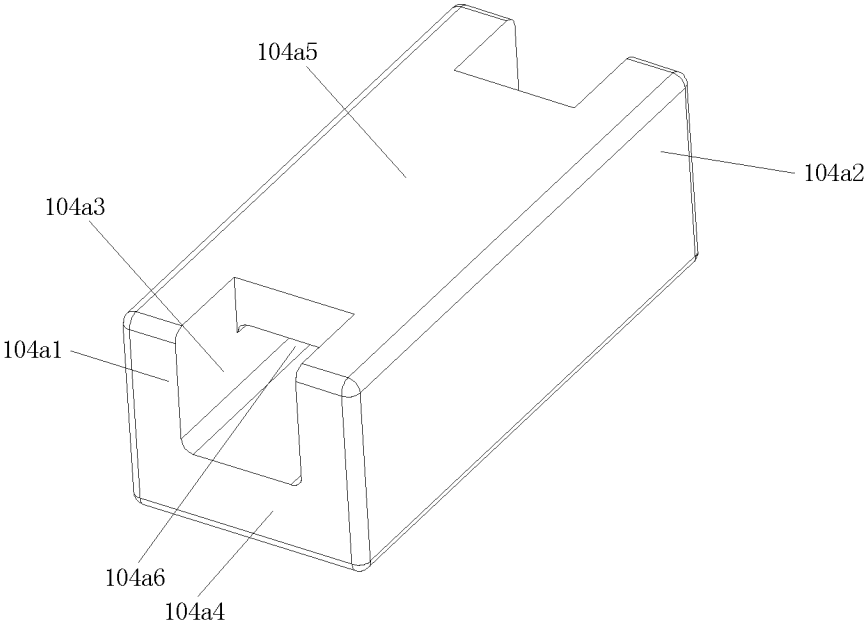


FIG. 8

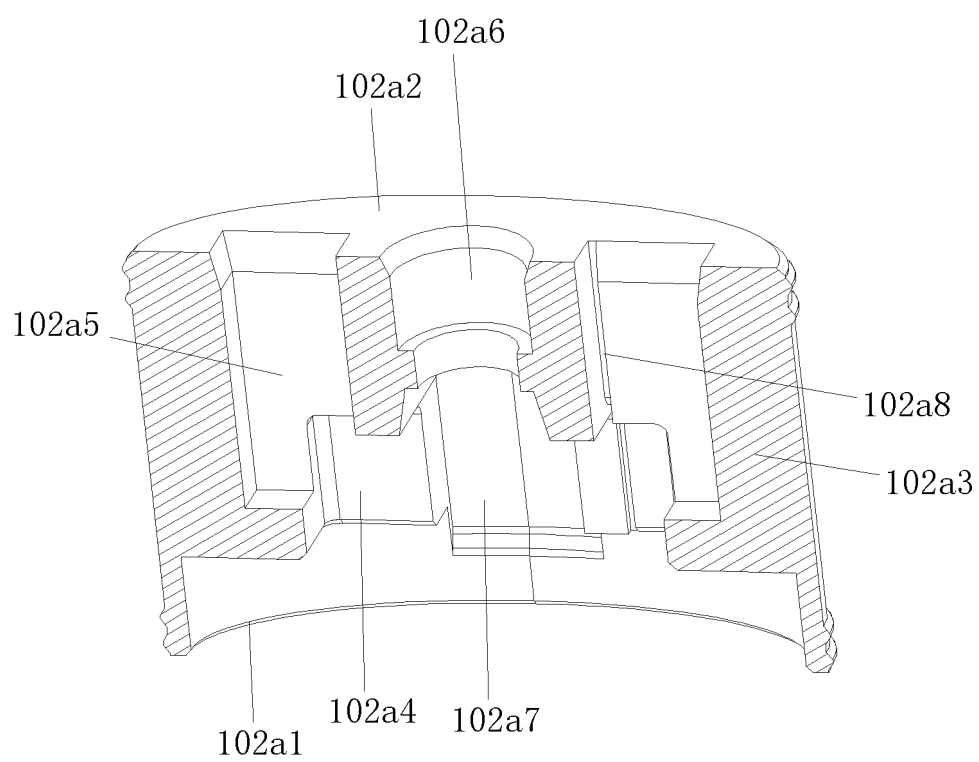


FIG. 9

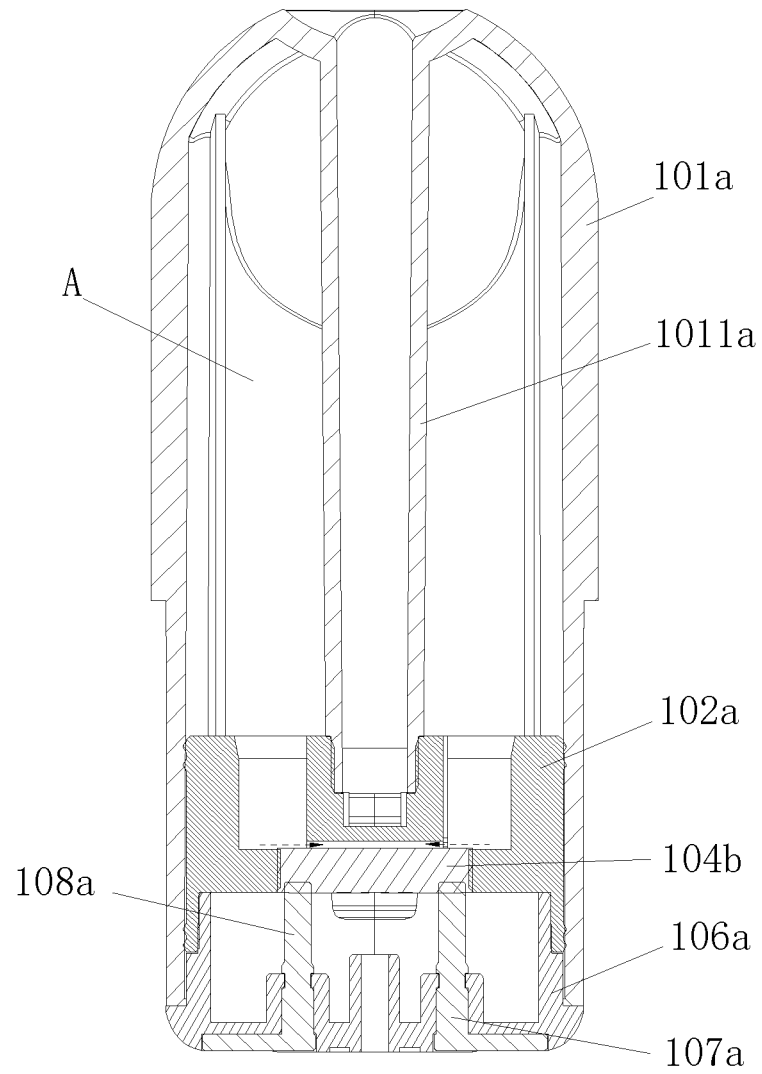


FIG. 10

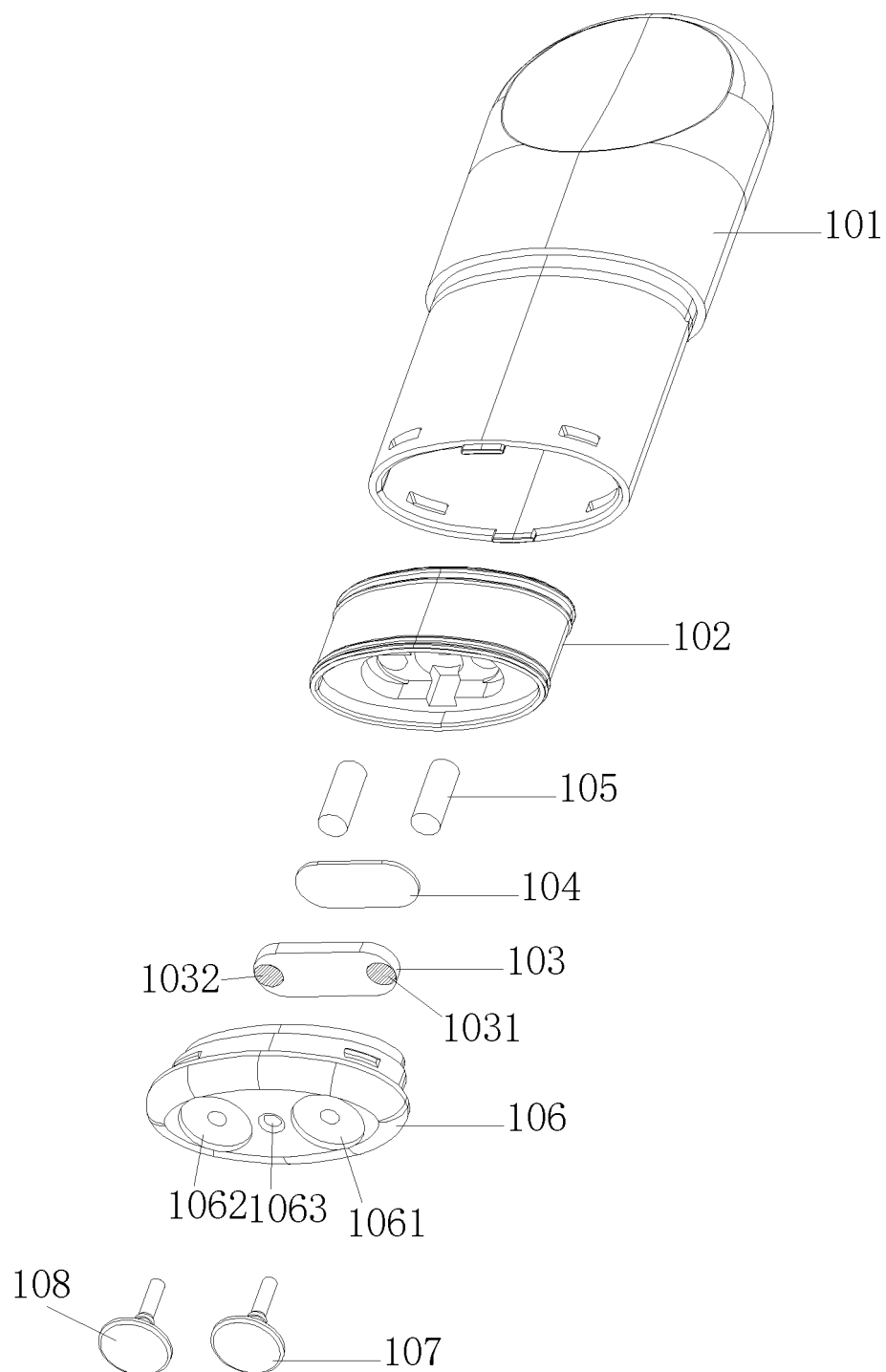


FIG. 11

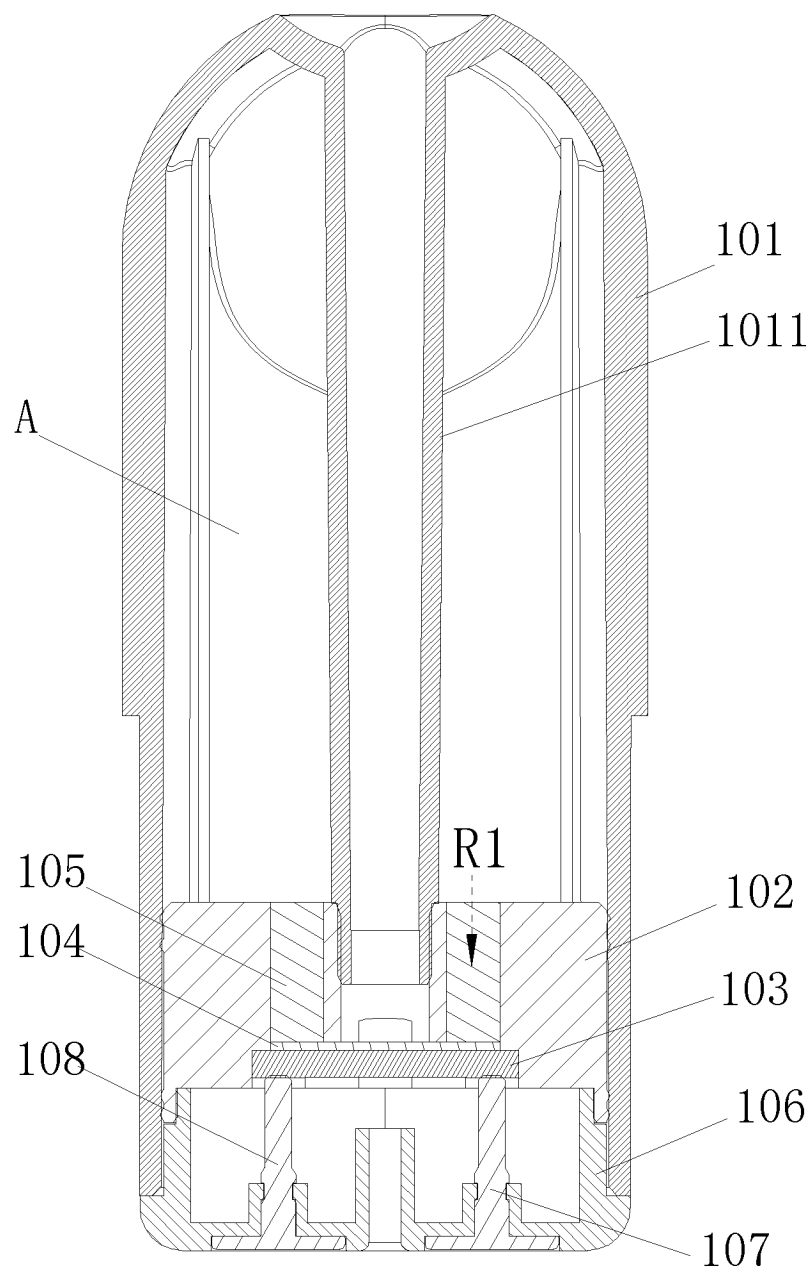


FIG. 12

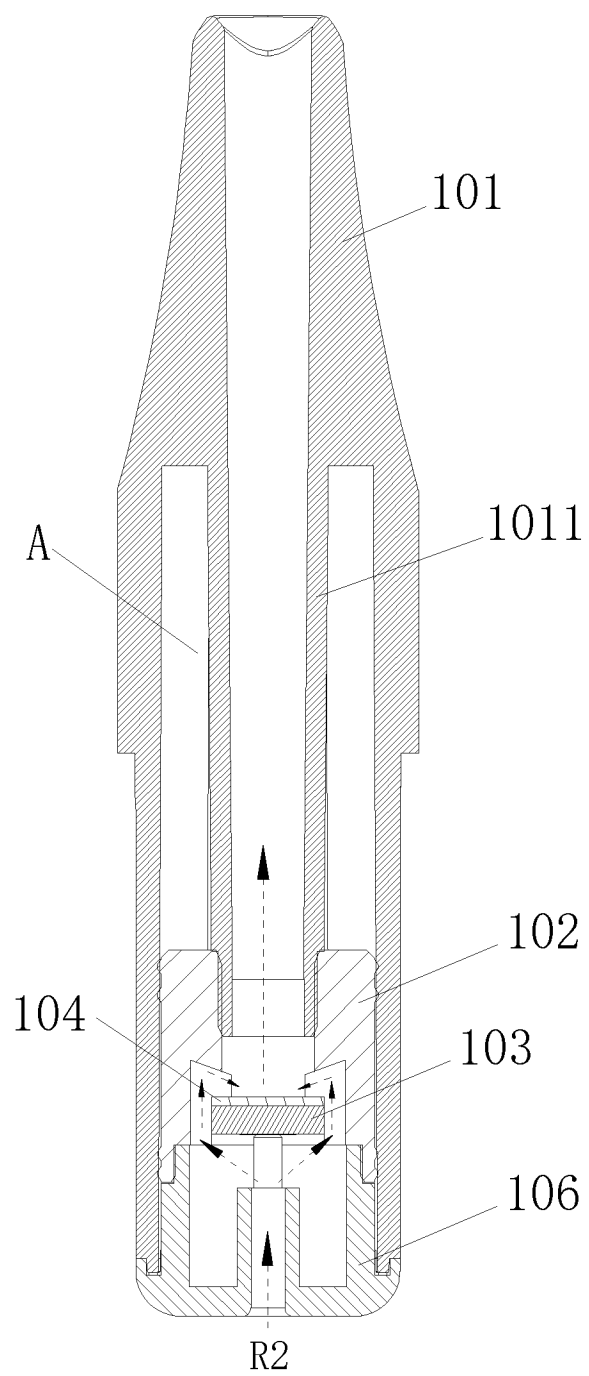


FIG. 13

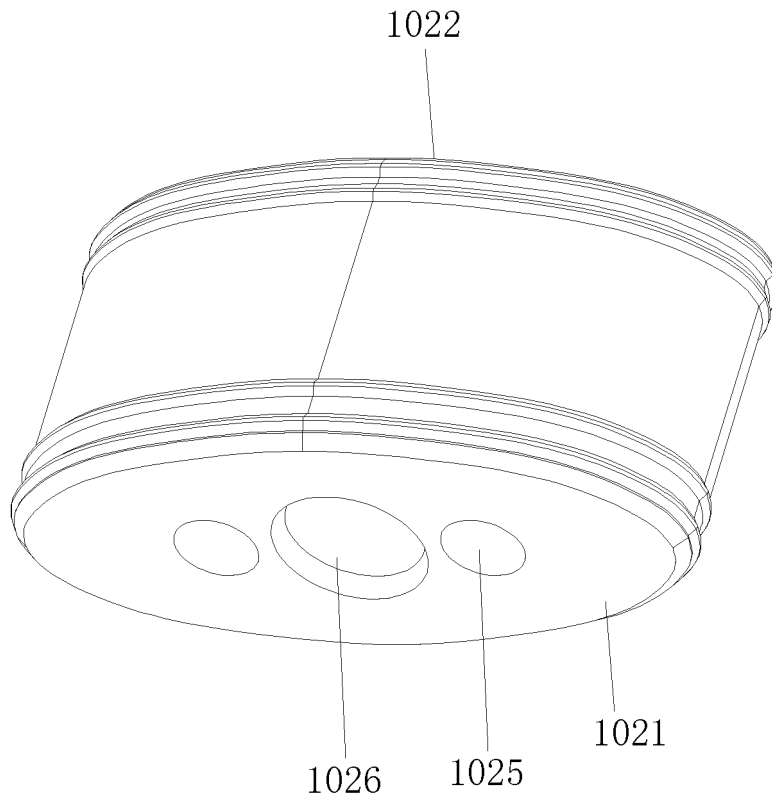


FIG. 14

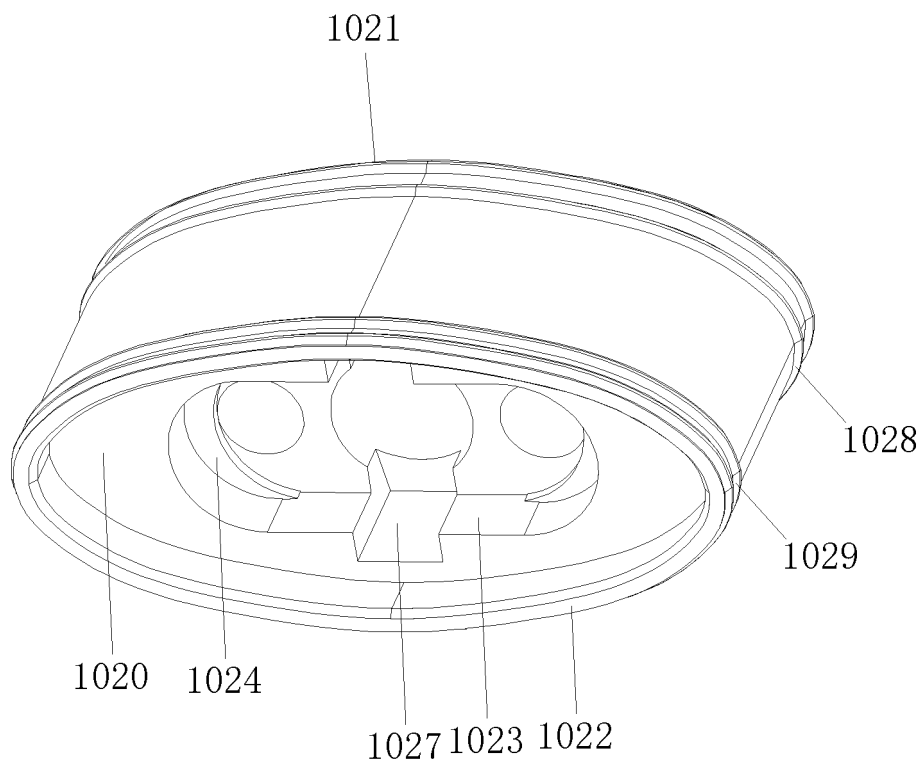


FIG. 15

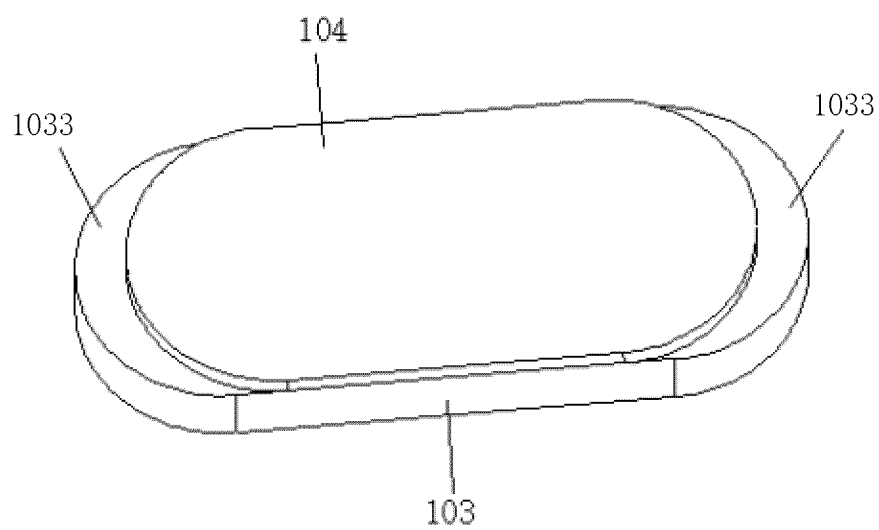


FIG. 16

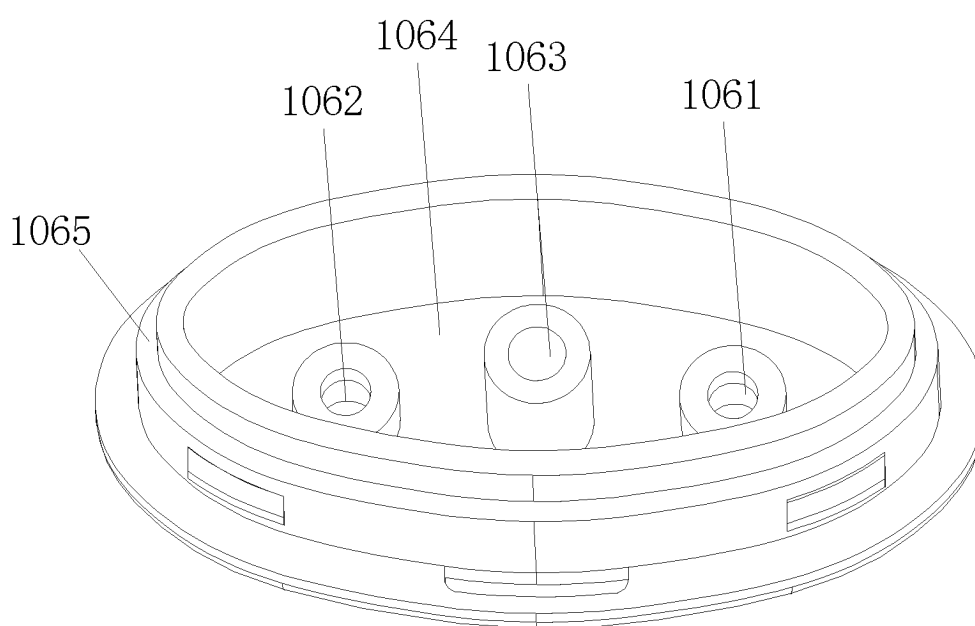


FIG. 17

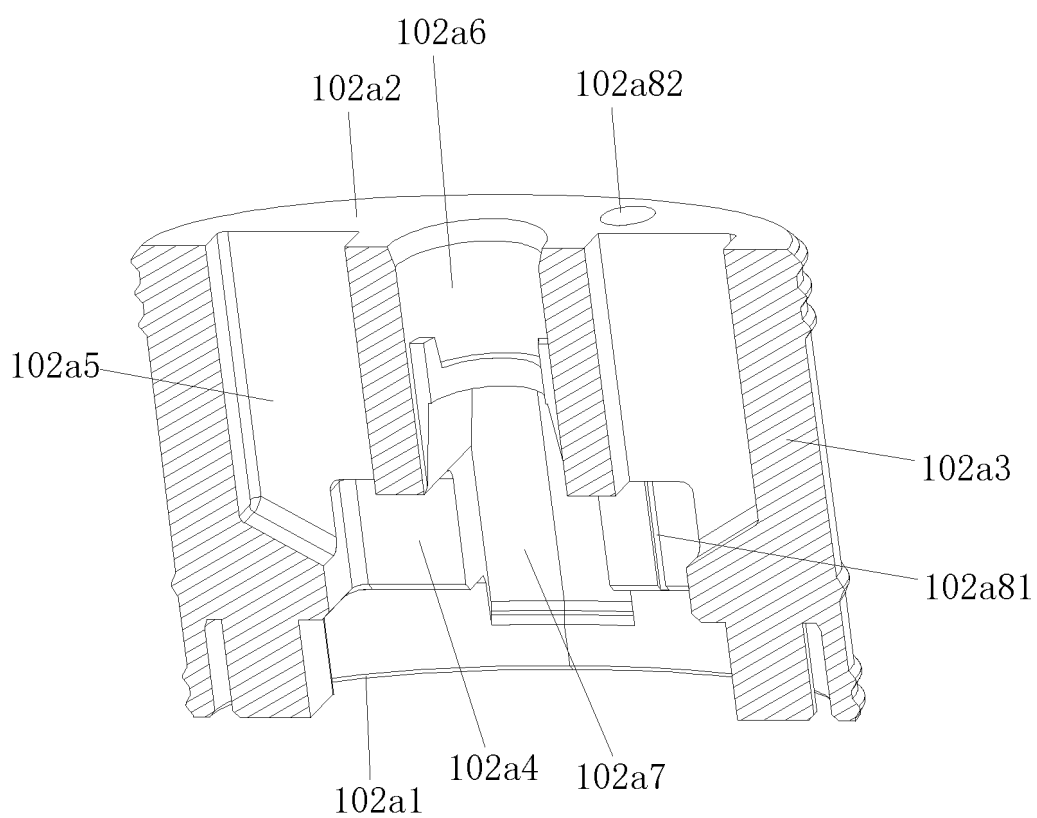


FIG. 18

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2023/072126

A. CLASSIFICATION OF SUBJECT MATTER

A24F40/40(2020.01);A24F40/10(2020.01);A24F40/42(2020.01);A24F40/46(2020.01);A24F40/90(2020.01);A24F40/50(2020.01);

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)

A24F40,A24F47

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)

CNTXT, ENTXT, VEN: 雾化, 密封, 弹性, 柔性, 收纳腔, 容纳腔, 气流通道, 气道, 气路, 通气槽, 通道, 流道, 流路, electronic, atomiz+, elastic, flexible, seal+, contain+, cavity, chamber, air, passage, channel, ultrasonic+, heating, plate

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 216983599 U (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 19 July 2022 (2022-07-19) claims 1-17	1-17
PX	CN 216983576 U (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 19 July 2022 (2022-07-19) description, paragraphs 31-56, and figures 1-10	1-17
X	CN 113115987 A (DONGGUAN ALPHA ELECTRONIC TECHNOLOGY CO., LTD.) 16 July 2021 (2021-07-16) descriptions 33-45 and 50-55, and figures 1-7	1-17
Y	CN 215347027 U (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 31 December 2021 (2021-12-31) description, paragraphs 50-55, and figures 1-4	1-17
Y	CN 205671480 U (CHINA TOBACCO HUNAN INDUSTRIAL CO., LTD.) 09 November 2016 (2016-11-09) description, paragraphs 23-33, and figures 1-4	1-17

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

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"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

11 May 2023

Date of mailing of the international search report

14 May 2023

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/CN2023/072126

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2021185313 A1 (CHANGZHOU PATENT ELECTRONIC TECHNOLOGY) 23 September 2021 (2021-09-23) entire document	1-17

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2023/072126

Patent document cited in search report			Publication date (day/month/year)		Patent family member(s)			Publication date (day/month/year)	
CN	216983599	U	19 July 2022		None				
CN	216983576	U	19 July 2022		None				
CN	113115987	A	16 July 2021		CN	216601645	U	27 May 2022	
CN	215347027	U	31 December 2021		None				
CN	205671480	U	09 November 2016		None				
WO	2021185313	A1	23 September 2021		CN	212260474	U	01 January 2021	
					US	2023017889	A1	19 January 2023	
					EP	4122334	A1	25 January 2023	

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

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- CN 202210034964 [0001]
- CN 202210056122 [0001]