

(19)



(11)

EP 3 928 640 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
29.12.2021 Bulletin 2021/52

(51) Int Cl.:
A24F 40/485 (2020.01)

(21) Application number: **21174402.4**

(22) Date of filing: **18.05.2021**

(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 MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

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(30) Priority: **24.06.2020 CN 202010587235**

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(54) **VAPORIZATION DEVICE**

(57) This application relates to a vaporization component. The provided vaporization component includes: a base, a first hole in the base, and a valve structure. The valve structure is configured to open or close the first hole.

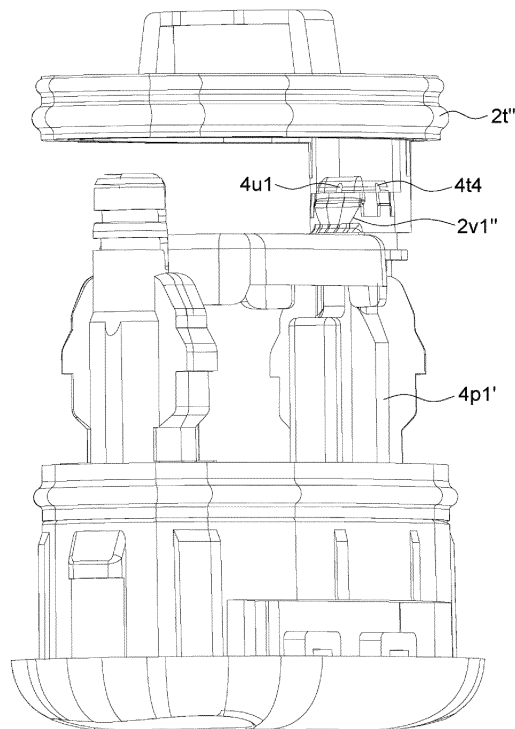


FIG. 14A

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Description

may be increased or reduced arbitrarily for the purpose of clear description.

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] The present application claims the benefit of priority from the China Patent Application No. 202010587235.0, filed on 24 June 2020, the disclosure of which is hereby incorporated by reference in its entirety.

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FIG. 1A is an exemplary view of a front surface of a vaporization device according to some embodiments of this application.

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FIG. 1B is an exemplary schematic combination diagram of a vaporization device according to some embodiments of this application.

BACKGROUND OF THE INVENTION**1. Field of the Invention**

[0002] This application generally relates to an electronic device, and specifically, to a vaporization device for providing an inhalable aerosol.

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FIG. 2A and FIG. 2B are exploded views of a cartridge according to some embodiments of this application.

2. Description of the Related Art

[0003] With the increasingly strict regulations and restrictions on tobacco products in various regions and governments around the world, people's demands for tobacco substitutes also continue to grow. An electronic cigarette device may be a tobacco substitute, which uses an electronic aerosol generation device or an electronic vaporization device to vaporize a vaporizable material (for example, e-liquid) to generate an aerosol for inhalation by a user, thereby achieving a sensory experience of simulated smoking. Relative to traditional tobacco products, the electronic cigarette device as the substitute can effectively reduce harmful substances generated by combustion, thereby reducing harmful side effects of smoking. However, the existing electronic vaporization device has a serious e-liquid leakage problem.

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FIG. 3A is a schematic diagram of a front surface of an upper cap according to some embodiments of this application.

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FIG. 3B is a cross-sectional view of an upper cap according to some embodiments of this application.

FIG. 3C and FIG. 3D are three-dimensional views of an upper cap according to some embodiments of this application.

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FIG. 4A is a schematic diagram of a front surface of an upper cap according to some embodiments of this application.

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FIG. 4B is a cross-sectional view of an upper cap according to some embodiments of this application.

FIG. 4C and FIG. 4D are three-dimensional views of an upper cap according to some embodiments of this application.

[0004] Therefore, a vaporization device which can resolve the above problem is provided in the present disclosure.

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FIG. 5A is a cross-sectional view of a top sealing structure according to some embodiments of this application.

SUMMARY OF THE INVENTION

[0005] A vaporization component is provided. The provided vaporization component includes: a base, a first hole in the base, and a valve structure. The valve structure is configured to open or close the first hole.

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FIG. 5B is a cross-sectional view of a top sealing structure according to some embodiments of this application.

[0006] A vaporization device is provided. The provided vaporization device includes: a housing, a base, a first hole located between the housing and the base, and a valve structure. The valve structure is configured to open or close the first hole.

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FIG. 6A and FIG. 6B are exploded views of a lower cap according to some embodiments of this application.

FIG. 6C is a schematic diagram of a bottom surface of a lower cap according to some embodiments of this application.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] The aspects of this application will become more comprehensible from the following detailed description made with reference to the accompanying drawings. It should be noted that, various features may not be drawn to scale, and the sizes of the various features

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FIG. 6D is a cross-sectional view of a lower cap according to some embodiments of this application.

FIG. 6E is a schematic diagram of a top surface of a lower cap according to some embodiments of this

application.

FIG. 7A is an exploded cross-sectional view of some components of a cartridge according to some embodiments of this application.

FIG. 7B is a cross-sectional view of a cartridge according to some embodiments of this application.

FIG. 8 is a schematic assembly diagram of a cartridge according to some embodiments of this application.

FIG. 9A is a schematic assembly diagram of a cartridge according to some embodiments of this application.

FIG. 9B is a cross-sectional view of a cartridge according to some embodiments of this application.

FIG. 9C is a cross-sectional view of a cartridge according to some embodiments of this application.

FIG. 9D is a cross-sectional view of an upper cap and a lower cap according to some embodiments of this application.

FIG. 10A and FIG. 10B are schematic diagrams of relative positions of a metal structure and an aerosol generation component according to some embodiments of this application.

FIG. 11 is a schematic diagram of a front surface of an upper cap according to some embodiments of this application.

FIG. 12A is a schematic diagram of a front surface of a top sealing structure according to some embodiments of this application.

FIG. 12B is a cross-sectional view of a top sealing structure according to some embodiments of this application.

FIG. 12C is a three-dimensional top view of a top sealing structure according to some embodiments of this application.

FIG. 12D is a three-dimensional bottom view of a top sealing structure according to some embodiments of this application.

FIG. 13A and FIG. 13B are three-dimensional views of a lower cap according to some embodiments of this application.

FIG. 14A is a schematic assembly diagram of a cartridge according to some embodiments of this application.

cation.

FIG. 14B is an assembly cross-sectional view of a cartridge according to some embodiments of this application.

[0008] The drawings and detailed descriptions use the same reference numerals to indicate same or similar elements. The features of this application will be more apparent from the detailed descriptions made with reference to the accompanying drawings.

PREFERRED EMBODIMENT OF THE PRESENT INVENTION

[0009] The following disclosure provides many different embodiments or examples for implementing different features of the provided subject matters. Particular examples of components and deployments are described below. Certainly, there are merely examples and are not intended to be limitative. In this application, in the following descriptions, reference formed by the first feature above or on the second feature may include an embodiment formed by direct contact between the first feature and the second feature, and may further include an embodiment in which an additional feature may be formed between the first feature and the second feature to enable the first feature and the second feature to be not in direct contact. In addition, in this application, reference numerals and/or letters may be repeated in examples. This repetition is for the purpose of simplification and clarity, and does not indicate a relationship between the described various embodiments and/or configurations.

[0010] The embodiments of this application are described in detail below. However, it should be understood that, this application provides many applicable concepts that can be implemented in various particular cases. The described particular embodiments are only illustrative and do not limit the scope of this application. As used herein, the term "aerosol for inhalation by a user" may include, but is not limited to, aerosols, suspended liquids, low temperature vapors, and volatile gases.

[0011] In an existing electronic cigarette product, a pressure balance of a liquid storage chamber is not considered. In the existing electronic cigarette product, the liquid storage chamber is generally designed to be completely sealed to prevent vaporizable solution from overflow. During transport, pressure in a liquid storage chamber of a manufactured electronic cigarette product may be increased due to a temperature change or a pressure change. The increase of the pressure in the liquid storage chamber causes a great amount of e-liquid to flow toward an aerosol generation component, and may cause an e-liquid leakage problem to the electronic cigarette product. In addition, with continuous use of the electronic cigarette product by a user, a vaporizable solution in the liquid storage chamber is continuously consumed and decreased, so that the pressure in the liquid storage cham-

ber is decreased to form a negative pressure. The negative pressure causes the vaporizable solution in the liquid storage chamber to be difficult to uniformly flow to the aerosol generation component, so that the aerosol generation component does not uniformly absorb the vaporizable solution. In this case, when the temperature increases, there is a high probability for the aerosol generation component to burn out and generate a burnt smell, causing a bad user experience.

[0012] FIG. 1A is an exemplary view of a front surface of a vaporization device according to some embodiments of this application.

[0013] A vaporization device 100 may include a cartridge 100A and a body 100B. In some embodiments, the cartridge 100A and the body 100B may be designed as a unity. In some embodiments, the cartridge 100A and the body 100B may be designed as two separate components. In some embodiments, the cartridge 100A may be designed to be removably combined with the body 100B. In some embodiments, when the cartridge 100A is combined with the body 100B, the cartridge 100A is partly accommodated in the body 100B. In some embodiments, the cartridge 100A may be referred to as a liquid storage component, and the body 100B may be referred to as a main body or a battery component.

[0014] The top of the cartridge 100A is provided with an opening 1h1. The opening 1h1 may be used as an aerosol outlet. The user may inhale, through the opening 1h1, aerosol generated by the vaporization device 100. The body 100B and the cartridge 100A may be coupled to each other through a conductive contact (not shown). When the user performs inhalation on the opening 1h1, the body 100B may supply power to the cartridge 100A, so that an aerosol generation component of the cartridge 100A heats a vaporizable material stored in the cartridge 100A and generates aerosol.

[0015] FIG. 1B is an exemplary schematic combination diagram of a vaporization device according to some embodiments of this application.

[0016] The body 100B has a body housing 22. The body housing 22 has an opening 22h. The opening 22h may accommodate a part of the cartridge 100A. The opening 22h may cover a part of the cartridge 100A. In some embodiments, the cartridge 100A may be designed to be removably combined with the body 100B. In some embodiments, the cartridge 100A may not have directionality. In some embodiments, the cartridge 100A may be removably combined with the body 100B in either of two different directions. The surface of the body 100B has a light transmitting element 221. A plurality of light transmitting elements 221 may surround and form a particular shape or image, for example, a circle. The light transmitting element 221 may be a through hole.

[0017] FIG. 2A and FIG. 2B are exploded views of a cartridge according to some embodiments of this application.

[0018] The cartridge 100A may include a mouthpiece cap 1b and a cartridge housing 1. In some embodiments,

the mouthpiece cap 1b and the cartridge housing 1 may be two separate components. In some embodiments, the mouthpiece cap 1b and the cartridge housing 1 may be made of different materials. In some embodiments, the mouthpiece cap 1b and the cartridge housing 1 may be integrally formed. In some embodiments, the mouthpiece cap 1b and the cartridge housing 1 may be made of the same material.

[0019] The cartridge 100A further includes an upper cap 2, an aerosol generation component 3, a lower cap 4, an attractive component 5a, and an attractive component 5b. In the present disclosure, the upper cap 2 and the lower cap 4 may be jointly referred to as a base. When assembled together, the upper cap 2 and the lower cap 4 may be referred to as a base of the cartridge 100A. The upper cap 2 and the lower cap 4 may be considered as a vaporization component.

[0020] The top of the mouthpiece cap 1b is provided with an opening 1h1. The opening 1h1 may be used as an aerosol outlet. The user may inhale, through the opening 1h1, aerosol generated by the vaporization device 100. The opening 1h1 is in communication with a tube 1t extending into the cartridge housing 1. The tube 1t may transfer aerosol generated by the aerosol generation component 3 to the opening 1h1 for inhaling by the user.

[0021] The cartridge housing 1 is provided with an opening 1h2 and an opening 1h3 near the bottom. The opening 1h2 and the opening 1h3 may respectively correspond to a buckle structure 4b1 and a buckle structure 4b2 on the lower cap 4. The cartridge housing 1 may be mechanically coupled to the lower cap 4 through the opening 1h2, the opening 1h3, the buckle structure 4b1, and the buckle structure 4b2.

[0022] The bottom of the aerosol generation component 3 may include a heating element 31. By supplying power to the heating element 31, the heating element 31 may improve a temperature of the aerosol generation component 3, vaporize e-liquid absorbed by the aerosol generation component 3, and generate aerosol. The aerosol generation component 3 may include a groove 3c, the vaporizable material may be in direct contact with the aerosol generation component 3 through an inner wall of the groove 3c. The vaporizable material may be a liquid. The vaporizable material may be a solution. In subsequent paragraphs of this application, the vaporizable material may alternatively be referred to as e-liquid. The e-liquid is edible.

[0023] In some embodiments, the aerosol generation component 3 may be an infrared component that can heat e-liquid. In some embodiments, the aerosol generation component 3 may be an ultrasonic component that can heat e-liquid. In some embodiments, the aerosol generation component 3 may be an infrared component that can heat solid-state tobacco. In some embodiments, the aerosol generation component 3 may be an ultrasonic component that can heat solid-state tobacco.

[0024] The lower cap 4 may include a columnar struc-

ture 4p1 and a columnar structure 4p2. After the cartridge 100A is assembled, the columnar structure 4p1 and the columnar structure 4p2 may extend into the upper cap 2.

[0025] The attractive component 5a and the attractive component 5b may be respectively disposed in the opening 4h1 and the opening 4h2 of the bottom of the lower cap 4. In some embodiments, the attractive component 5a and the attractive component 5b may have electrical conductivity. The body 100B may transfer power to the aerosol generation component 3 in the cartridge 100A through the attractive component 5a and the attractive component 5b. In some embodiments, the attractive component 5a and the attractive component 5b may have magnetic properties. The attractive component 5a and the attractive component 5b may be disposed in a metal contact or conductive contact in the body 100B in an adsorbing manner. When the cartridge 100A and the body 100B are combined with each other, the attractive component 5a and the attractive component 5b may enable the cartridge 100A to be not easy to loose from the body 100B.

[0026] FIG. 3A is a schematic diagram of a front surface of an upper cap according to some embodiments of this application.

[0027] The upper cap 2 may include a top sealing structure 2t, a body 2m, and a bottom sealing structure 2b. In some embodiments, the top sealing structure 2t and the body 2m may have different hardness. In some embodiments, the bottom sealing structure 2b and the body 2m may have different hardness. In some embodiments, the top sealing structure 2t and the body 2m may include different materials. In some embodiments, the bottom sealing structure 2b and the body 2m may include different materials. In some embodiments, the hardness of the top sealing structure 2t may be less than that of the body 2m. In some embodiments, the hardness of the bottom sealing structure 2b may be less than that of the body 2m.

[0028] The top sealing structure 2t may have elasticity. The top sealing structure 2t may have flexibility. The bottom sealing structure 2b may have elasticity. The bottom sealing structure 2b may have flexibility.

[0029] The material of the body 2m may be hard plastics, such as polypropylene (PP) or polyethylene (PE), but another suitable material may be selected according to actual conditions, and this application is not limited thereto. The material of the top sealing structure 2t may include silica gel, rubber, or siloxane, but another suitable material may be selected according to actual situations, and this application is not limited thereto. The material of the bottom sealing structure 2b may include silica gel, rubber, or siloxane, but another suitable material may be selected according to actual conditions, and this application is not limited thereto. After the upper cap 2 and the cartridge housing 1 are assembled, the top sealing structure 2t and the bottom sealing structure 2b may provide an effect of sealing liquid or gas.

[0030] The top sealing structure 2t, the body 2m, and the bottom sealing structure 2b may be formed using an

integral injection molding technique. The upper cap 2 may be formed using an integral injection molding technique.

[0031] The bonding force between the top sealing structure 2t or the bottom sealing structure 2b and the body 2m is within a range of 0.1N/cm² to 20N/cm². In some embodiments, without damaging the structural integrity of the top sealing structure 2t or the body 2m, the user cannot separate the top sealing structure 2t from the body 2m. In some embodiments, without damaging the structural integrity of the bottom sealing structure 2b or the body 2m, the user cannot separate the bottom sealing structure 2b from the body 2m.

[0032] Because the top sealing structure 2t or the bottom sealing structure 2b and the body 2m may be formed using an integral injection molding technique, there is no component deviation problem or part tolerance problem, thereby reducing the leakage of e-liquid or condensed liquid. Because the upper cap 2 may be formed using an integral injection molding technique, there is no component deviation problem or part tolerance problem for the upper cap 2, thereby reducing the leakage risk of e-liquid or condensed liquid.

[0033] Because a single component may be formed between the top sealing structure 2t or the bottom sealing structure 2b and the body 2m using an integral injection molding technique, the quantity of components of the cartridge 100A may be reduced, thereby lowering difficulty in production of the cartridge 100A. The upper cap 2 is a single component, so that the quantity of the components of the cartridge 100A may be reduced and production/assembly efficiency of the cartridge 100A may be improved.

[0034] FIG. 3B is a cross-sectional view of an upper cap according to some embodiments of this application.

[0035] The top sealing structure 2t includes a valve structure 2v1 and a valve structure 2v2. Detailed constructions and functions of the valve structure 2v1 and the valve structure 2v2 are described in the subsequent paragraphs of this application. The valve structure 2v1 and the valve structure 2v2 may alternatively be referred to as switches in this application. The valve structure 2v1 and the valve structure 2v2 may alternatively be referred to as switch structures in this application.

[0036] The top sealing structure 2t includes an outward extension structure 2t1 disposed on the top of a tubular structure 2m1 of the body 2m, a flange 2t2 disposed inside the tubular structure 2m1 of the body 2m, a flange 2t3 disposed in the periphery of the top of the body 2m, and an aerosol generation component sealing portion 2t4 disposed between the valve structure 2v1 and the valve structure 2v2.

[0037] After the upper cap 2 and the cartridge 100A are assembled, the outward extension structure 2t1 may be located on the outer surface of the upper cap 2, and abuts against between the tube 1t in the cartridge 100A and the tubular structure 2m1 of the upper cap 2, to provide a sealing effect between the tube 1t and the tubular

structure 2m1. After the upper cap 2 and the cartridge 100A are assembled, a part of the tube 1t (that is, partial 1t2) may extend into the tubular structure 2m1. In this case, the flange 2t2 may provide a sealing effect between the tube 1t and the tubular structure 2m1.

[0038] After the upper cap 2 and the cartridge 100A are assembled, the flange 2t3 may abut against the inner wall of the cartridge housing 1, so as to provide a sealing effect between the upper cap 2 and the cartridge housing 1. After the upper cap 2 and the aerosol generation component 3 are assembled, the aerosol generation component sealing portion 2t4 may abut against around the top of the aerosol generation component 3, so as to provide a sealing effect between the upper cap 2 and the aerosol generation component 3.

[0039] As shown in FIG. 3B, the bottom sealing structure 2b includes a flange 2b1 and an outward extension structure 2b2.

[0040] After the upper cap 2 and the cartridge 100A are assembled, the flange 2b1 may abut against the inner wall of the cartridge housing 1, so as to provide a sealing effect between the upper cap 2 and the cartridge housing 1.

[0041] After the upper cap 2 and the lower cap 4 are assembled, the outward extension structure 2b2 may abut against between the upper cap 2 and the lower cap 4, and further provide a sealing effect between the upper cap 2 and the lower cap 4.

[0042] FIG. 3C and FIG. 3D are three-dimensional views of an upper cap according to some embodiments of this application.

[0043] FIG. 3C is a three-dimensional view showing the bottom of the upper cap 2. As shown in FIG. 3C, the valve structure 2v1 may surround an opening 2h1. The valve structure 2v2 may surround an opening 2h2. The upper cap 2 includes a liquid channel 2q1 and a liquid channel 2q2 that run through the body 2m. E-liquid stored in the cartridge 100A may flow to the aerosol generation component 3 through the liquid channel 2q1 and the liquid channel 2q2. The aerosol generation component sealing portion 2t4 surrounds the peripheries of the liquid channel 2q1 and the liquid channel 2q2. The aerosol generation component sealing portion 2t4 can prevent the e-liquid stored in the cartridge 100A from flowing outside the aerosol generation component 3.

[0044] FIG. 3D is a three-dimensional view showing the top of the upper cap 2. As shown in FIG. 3D, the valve structure 2v1 includes a notch 2r1, a notch 2r2, and an elastic structure 2p1. The valve structure 2v2 includes a notch 2r3, a notch 2r4, and an elastic structure 2p2. The notch 2r1 and the notch 2r2 can enable the elastic structure 2p1 to be easy to bend. In some embodiments, the elastic structure 2p1 may bend toward the inner side of the opening 2h1. In some embodiments, the elastic structure 2p1 may bend toward the outer side of the opening 2h1. The elastic structure 2p1 may close the opening 2h1 by contacting a part of the lower cap 4. The elastic structure 2p1 may close the opening 2h1 by contacting the

columnar structure 4p1 or the columnar structure 4p2 of the lower cap 4.

[0045] The elastic structure 2p1 can enable the valve structure 2v1 to function as a one-way air valve, which is described in detail in the subsequent paragraphs. In some embodiments, the elastic structure 2p1 may have a sheet-like shape. In some embodiments, the elastic structure 2p1 may have a lingulate shape.

[0046] The notch 2r3 and the notch 2r4 can enable the elastic structure 2p2 to be easy to bend. In some embodiments, the elastic structure 2p2 may bend toward the inner side of the opening 2h2. In some embodiments, the elastic structure 2p2 may bend toward the outer side of the opening 2h2. The elastic structure 2p2 can enable the valve structure 2v2 to function as a one-way air valve, which will be described in detail in the subsequent paragraphs. In some embodiments, the elastic structure 2p2 may have a sheet-like shape. In some embodiments, the elastic structure 2p2 may have a lingulate shape.

[0047] FIG. 4A is a schematic diagram of a front surface of an upper cap according to some embodiments of this application. FIG. 4A shows an upper cap 2'. The upper cap 2' may include a top sealing structure 2t', a body 2m', and a bottom sealing structure 2b. Compared with the upper cap 2 shown in FIG. 3A to FIG. 3D, the upper cap 2' may include a similar structure and a similar material. However, the top sealing structure 2t' and the top sealing structure 2t may have a difference in their structures, and the body 2m' and the body 2m may have a difference in their structures.

[0048] The upper cap 2' and the upper cap 2 may be compatible components for each other. In the cartridge 100A, the upper cap 2' or the upper cap 2 may be selected to be combined with other components without affecting the functional integrity of the cartridge 100A.

[0049] FIG. 4B is a cross-sectional view of an upper cap according to some embodiments of this application.

[0050] As shown in FIG. 4B, the upper cap 2' may have a valve structure 2v1' only on one side thereof, and have a cavity 2c1 on the other side thereof. The valve structure 2v1' and the valve structure 2v1 or the valve structure 2v2 shown in FIG. 3A to FIG. 3D may have the same structural features.

[0051] Compared with the upper cap 2 shown in FIG. 3A to FIG. 3D, the body 2m' of the upper cap 2' may further include a sliding groove 2u1 and a sliding groove 2u2. The sliding groove 2u1 and the sliding groove 2u2 may extend from the bottom of the body 2m' to a cavity 2c2 configured to accommodate the aerosol generation component 3. Although not shown in FIG. 4B, the body 2m' may further include a sliding groove 2u3 and a sliding groove 2u4 that are respectively provided on opposite sides of the sliding groove 2u1 and the sliding groove 2u2.

[0052] The side wall of the sliding groove 2u1 has different thicknesses. In some embodiments, the side wall of the sliding groove 2u1 gradually becomes thicker from the bottom of the body 2m' to the cavity 2c2. As shown in FIG. 4B, the side wall of the sliding groove 2u1 has a

thickness 2w1 near the cavity 2c2, and has a thickness 2w2 near the bottom of the body 2m'. The thickness 2w1 is greater than the thickness 2w2. Similarly, the side walls of the sliding groove 2u2, the sliding groove 2u3, and the sliding groove 2u4 gradually become thicker from the bottom of the body 2m' to the cavity 2c2.

[0053] When the cartridge 100A is assembled, the aerosol generation component 3 may accurately enter predetermined positions of the upper cap 2' along the sliding groove 2u1, the sliding groove 2u2, the sliding groove 2u3, and the sliding groove 2u4 without further manually adjusting a position of the aerosol generation component 3 by using fingers or a tool. Therefore, simplicity and convenience in assembling the cartridge 100A are improved.

[0054] FIG. 4C and FIG. 4D are three-dimensional views of an upper cap according to some embodiments of this application.

[0055] FIG. 4C is a three-dimensional view showing the bottom of the upper cap 2'. FIG. 4D is a three-dimensional view showing the top of the upper cap 2'. As shown in FIG. 4C and FIG. 4D, the valve structure 2v1' may surround an opening 2h1'. The sliding groove 2u1, the sliding groove 2u2, the sliding groove 2u3, and the sliding groove 2u4 may surround the cavity 2c2. The cavity 2c2 may be configured to accommodate the aerosol generation component 3.

[0056] FIG. 5A is a cross-sectional view of a top sealing structure according to some embodiments of this application. FIG. 5A is a cross-sectional view of the top sealing structure 2t. Although the top sealing structure 2t is shown individually in FIG. 5A, the top sealing structure 2t and the body 2m may be considered as a single component. The top sealing structure 2t may be a part of the upper cap 2.

[0057] The top sealing structure 2t includes the valve structure 2v1 and the valve structure 2v2 that are bilaterally symmetrical. The valve structure 2v1 includes the notch 2r2 and the elastic structure 2p1 adjacent to the notch 2r2. The valve structure 2v2 includes the notch 2r4 and the elastic structure 2p2 adjacent to the notch 2r4. The aerosol generation component sealing portion 2t4 extends toward a direction opposite to the valve structure 2v1 and the valve structure 2v2.

[0058] FIG. 5B is a cross-sectional view of a top sealing structure according to some embodiments of this application. FIG. 5B is a cross-sectional view of the top sealing structure 2t'. Although the top sealing structure 2t' is shown individually in FIG. 5B, the top sealing structure 2t' and the body 2m' may be considered as a single component. The top sealing structure 2t' may be a part of the upper cap 2'. The top sealing structure 2t' includes the valve structure 2v1' only on one side thereof. The valve structure 2v1' is disposed asymmetrically in the top sealing structure 2t'.

[0059] FIG. 6A and FIG. 6B are exploded views of a lower cap according to some embodiments of this application.

[0060] FIG. 6A and FIG. 6B show the lower cap 4 and

metal structures 6a and 6b disposed in the lower cap 4. The metal structures 6a and 6b and the lower cap 4 may be formed using an integral injection molding technique. The user cannot separate the metal structure 6a or metal structure 6b from the lower cap 4 without damaging the structural integrity of the lower cap 4.

[0061] The lower cap 4 includes the columnar structure 4p1. One side of the columnar structure 4p1 includes a thin protrusion 4d1 and a buckle protrusion 4d2. The other side of the columnar structure 4p1 includes a thin protrusion 4d3 and a buckle protrusion 4d4. The thin protrusion 4d1, the thin protrusion 4d3, the buckle protrusion 4d2, and the buckle protrusion 4d4 provide particular functions during assembly of the cartridge 100A, which is described in detail in the subsequent paragraphs.

[0062] The lower cap 4 further includes a columnar structure 4p2 and an air inlet 4f provided between the columnar structure 4p1 and the columnar structure 4p2. When the user inhales from the opening 1h1, fresh air outside the cartridge 100A may enter the cartridge 100A through the air inlet 4f, and then aerosol generated by the aerosol generation component 3 is carried to the opening 1h1 along the tube 1t.

[0063] The metal structure 6a includes an elastic sheet structure 61 and a contact structure 62. The metal structure 6b includes an elastic sheet structure 63 and a contact structure 64. The contact structure 62 includes a protruding structure 62t, and the contact structure 64 includes a protruding structure 64t. The protruding structure 62t and the protruding structure 64t respectively protrude toward the opening 4h1 and the opening 4h2.

[0064] The elastic sheet structure 61 and the elastic sheet structure 63 may be in contact with the heating element 31 at the bottom of the aerosol generation component 3. The contact structure 62 and the contact structure 64 may be in direct contact with the attractive component 5a or 5b disposed in the opening 4h1 or the opening 4h2. The body 100B may supply power to the metal structure 6a or the metal structure 6b through the attractive component 5a or 5b. The protruding structure 62t can avoid poor contact between the metal structure 6a and the attractive component 5a that causes a broken circuit. The protruding structure 64t can avoid poor contact between the metal structure 6b and the attractive component 5b that causes a broken circuit.

[0065] Although not shown in the figure, the elastic sheet structure 61 may include a plurality of layers of structures. In some embodiments, the elastic sheet structure 61 may include a central layer, a first cladding layer, and a second cladding layer. In some embodiments, the thickness of the central layer may be within a range of 0.15 mm to 0.25 mm. In some embodiments, the thickness of the central layer is approximately 0.2 mm. In some embodiments, the material of the central layer may include copper-phosphorus alloy, copper tin alloy, phosphor bronze, or stainless steel. The first cladding layer is disposed on the surface of the central layer and in direct contact with the central layer. In some embodi-

ments, the thickness of the first cladding layer may be within a range of 60 μm to 100 μm . In some embodiments, the first cladding layer may include nickel. The first cladding layer may provide a preferable attaching force for the second cladding layer, and may increase electrical conductivity of the elastic sheet structure 61.

[0066] The second cladding layer is disposed on the surface of the first cladding layer and in direct contact with the first cladding layer. In some embodiments, the thickness of the second cladding layer may be within a range of 3 μm to 5 μm . In some embodiments, the second cladding layer may include gold. The second cladding layer may increase electrical conductivity of the elastic sheet structure 61.

[0067] FIG. 6C is a schematic diagram of a bottom surface of a lower cap according to some embodiments of this application.

[0068] As shown in FIG. 6C, the lower cap 4 includes the opening 4h1, the opening 4h2, and the air inlet 4f provided between the opening 4h1 and the opening 4h2. The inner side surface of the opening 4h1 may include a plurality of protruding structures 4e. The inner side surface of the opening 4h2 may include a plurality of protruding structures 4e. The protruding structures 4e can make the attractive component 5a and the attractive component 5b fixed in the opening 4h1 and the opening 4h2, and not be loosened due to continuous use by the user.

[0069] The air inlet 4f includes a first through hole 401 located near the center and a plurality of second through holes 402 surrounding a central opening. In some embodiments, there may be 5 second through holes 402. In some embodiments, there may be more than 5 second through holes 402. In some embodiments, there may be less than 5 second through holes 402.

[0070] The diameter of the first through hole 401 may be greater than that of the second through hole 402. In some embodiments, the diameter of the first through hole 401 may be within a range of 0.55 mm to 0.75 mm. In some embodiments, the diameter of the first through hole 401 is approximately 0.65 mm. In some embodiments, the diameter of the second through hole 402 may be within a range of 0.40 mm to 0.50 mm. In some embodiments, the diameter of the second through hole 402 is approximately 0.46 mm.

[0071] In some embodiments, after the cartridge 100A is assembled, the first through hole 401 of the air inlet 4f may be aligned with the geometrical center of the bottom surface of the aerosol generation component 3. According to a software simulation experiment result, a first through hole 401 having a relatively large diameter can enable fresh air to blow the heating element 31 at the bottom of the aerosol generation component 3 more uniformly, thereby improving the aerosol generation efficiency of the aerosol generation component 3.

[0072] In the direction perpendicular to the bottom surface of the aerosol generation component 3, the first through hole 401 is located below the aerosol generation component 3 and approximately corresponds to the cen-

tral position of the aerosol generation component 3, and all the second through holes 402 are located within a projection range of the aerosol generation component 3.

[0073] FIG. 6D is a cross-sectional view of a lower cap according to some embodiments of this application.

[0074] Referring to FIG. 6C and FIG. 6D. The contact structure 62 completely covers the opening 4h1, and the contact structure 64 completely covers the opening 4h2. The contact structure 62 can prevent the e-liquid or condensed liquid in the cartridge 100A from leaking out of the cartridge 100A from the opening 4h1. The contact structure 64 can prevent the e-liquid or condensed liquid in the cartridge 100A from leaking out of the cartridge 100A from the opening 4h2.

[0075] After the cartridge 100A is assembled, a distance between an upper surface 4s of the air inlet 4f and the bottom of the aerosol generation component 3 may be within a range of 1.5 mm to 3.5 mm. In some embodiments, the distance between the upper surface 4s of the air inlet 4f and the bottom of the aerosol generation component 3 may be within a range of 2 mm to 3 mm. The software simulation experiment result indicates that the foregoing distance settings can improve the aerosol generation efficiency of the aerosol generation component 3. The foregoing distance settings can improve an aerosol generation amount of the aerosol generation component 3.

[0076] FIG. 6E is a schematic diagram of a top surface of a lower cap according to some embodiments of this application. The air inlet 4f is provided between the columnar structure 4p1 and the columnar structure 4p2. The air inlet 4f includes the first through hole 401 and the plurality of second through holes 402 surrounding the first through hole 401. The elastic sheet structure 61 and the elastic sheet structure 63 are respectively disposed on two sides of the air inlet 4f. The elastic sheet structure 61 is disposed between the air inlet 4f and the columnar structure 4p1. The elastic sheet structure 63 is disposed between the air inlet 4f and the columnar structure 4p2.

[0077] FIG. 7A is an exploded cross-sectional view of some components of a cartridge according to some embodiments of this application.

[0078] FIG. 7A shows 3 components inside the cartridge 100A. FIG. 7A is a cross-sectional view showing the cartridge housing 1, the upper cap 2, and the lower cap 4.

[0079] The cartridge housing 1 includes the tube 1t extending toward the upper cap 2. The tube 1t may include a first portion 1t1 and a second portion 1t2. The first portion 1t1 and the second portion 1t2 may have different outer diameters. In some embodiments, the outer diameter of the first portion 1t1 is greater than that of the second portion 1t2. The smaller outer diameter of the second portion 1t2 enables the tube 1t to be inserted into the tubular structure 2m1 of the upper cap 2 more easily.

[0080] The inner diameter of the tube 1t may be non-uniform. In some embodiments, the inner diameter of the tube 1t may have a section gap 1s between the first por-

tion 1t1 and the second portion 1t2. The section gap 1s may alternatively be referred to as a staircase structure. As shown in FIG. 7A, the first portion 1t1 has an inner diameter 1w1 adjacent to the second portion 1t2, and the second portion 1t2 has an inner diameter 1w2 adjacent to the first portion 1t1. The inner diameter 1w1 and the inner diameter 1w2 are different. In some embodiments, the inner diameter 1w2 is less than the inner diameter 1w1.

[0081] When the aerosol generated by the aerosol generation component 3 is transferred toward the opening 1h1 along the tube 1t, the aerosol passes through the section gap 1s. After the aerosol passes through the section gap 1s, because the inner diameter of the tube 1t is expanded (which is expanded from 1w2 into 1w1), a probability that the aerosol is condensed in the inner wall of the tube 1t to generate condensed liquid can be reduced. The section gap 1s can reduce an amount of the condensed liquid generated during use of the cartridge 100A, thereby reducing the probability that the condensed liquid is leaked during use.

[0082] In some embodiments, the inner diameter of the tube 1t is relatively small in a portion near the upper cap 2, and the inner diameter of the tube 1t is relatively large in a portion away from the upper cap 2. In some embodiments, the inner diameter of the tube 1t is relatively small in a portion near the aerosol generation component 3, and the inner diameter of the tube 1t is relatively large in a portion away from the aerosol generation component 3.

[0083] The inner wall of the cartridge housing 1 further includes a staircase structure 1d. The staircase structure 1d may be formed due to the nonuniform thickness of the cartridge housing 1. The staircase structure 1d may be formed by an inner surface 1ds1 and an inner surface 1ds2 of the cartridge housing 1. The inner surface 1ds1 of the cartridge housing 1 and the inner surface 1ds2 of the cartridge housing 1 are not coplanar. There may be a section gap between the inner surface 1ds1 of the cartridge housing 1 and the inner surface 1ds2 of the cartridge housing 1. During assembly of the cartridge 100A, the staircase structure 1d may provide a resistance between the cartridge housing 1 and the upper cap 2. The top sealing structure 2t of the upper cap 2 abuts against the staircase structure 1d, and then reaches a predetermined position. In this case, a force toward the upper cap 2 is continuously applied to the lower cap 4, which may cause the thin protrusion 4d1 and the thin protrusion 4d3 of the columnar structure 4p1 to be deformed, causing the columnar structure 4p1 to go deep into and be fixed inside the upper cap 2. Similarly, the two thin protrusions of the columnar structure 4p2 are also deformed, causing the columnar structure 4p2 to go deep into and be fixed inside the upper cap 2.

[0084] FIG. 7B is a cross-sectional view of a cartridge according to some embodiments of this application. FIG. 7B is a cross-sectional view of the cartridge 100A.

[0085] As shown in FIG. 7B, after the cartridge 100A is assembled, the outward extension structure 2t1 of the

top sealing structure 2t may abut against between the tube 1t and the tubular structure 2m1, to provide a sealing effect between the tube 1t and the tubular structure 2m1. The outward extension structure 2t1 may be disposed on the upper surface of the tubular structure 2m1. The outward extension structure 2t1 may be disposed between the upper surface of the tubular structure 2m1 and a staircase structure 1d2 (referring to FIG. 7A) of the tube 1t.

[0086] After the cartridge 100A is assembled, a part of the tube 1t (that is, partial 1t2) may extend into the tubular structure 2m1. In this case, the flange 2t2 of the top sealing structure 2t may provide a sealing effect between the tube 1t and the tubular structure 2m1.

[0087] A storage compartment 10 is defined among the top sealing structure 2t, the tube 1t, and the inner surface 1s2 of the cartridge housing 1. The storage compartment 10 may accommodate e-liquid. After the cartridge 100A is assembled, the flange 2t3 of the top sealing structure 2t may abut against an inner surface 1s1 of the cartridge housing 1, so as to provide a sealing effect between the upper cap 2 and the cartridge housing 1. After the cartridge 100A is assembled, the aerosol generation component sealing portion 2t4 of the top sealing structure 2t may abut against around the top of the aerosol generation component 3, so as to provide a sealing effect between the upper cap 2 and the aerosol generation component 3. The aerosol generation component sealing portion 2t4 may surround the groove 3c of the aerosol generation component 3.

[0088] After the cartridge 100A is assembled, the flange 2b1 of the bottom sealing structure 2b may abut against the inner surface 1s1 of the cartridge housing 1, so as to provide a sealing effect between the upper cap 2 and the cartridge housing 1.

[0089] After the upper cap 2 and the lower cap 4 are assembled, the outward extension structure 2b2 of the bottom sealing structure 2b may abut against between the upper cap 2 and a surface 4s1 of the lower cap 4, so as to provide a sealing effect between the upper cap 2 and the lower cap 4.

[0090] After the cartridge 100A is assembled, a distance between the upper surface 4s of the air inlet 4f and the bottom surface 3s of the aerosol generation component 3 may be within a range of 1.5 mm to 3.5 mm. In some embodiments, the distance between the upper surface 4s of the air inlet 4f and the bottom surface 3s of the aerosol generation component 3 may be within a range of 2 mm to 3 mm.

[0091] FIG. 8 is a schematic assembly diagram of a cartridge according to some embodiments of this application. FIG. 8 shows relative positions of the upper cap 2 and the lower cap 4 after the cartridge 100A is assembled in the first stage. For the sake of simplicity of descriptions, the attractive component 5a and the attractive component 5b are not shown in FIG. 8. The foregoing components should be included during actual component of the cartridge 100A.

[0092] As shown in FIG. 8, the lower cap 4 and the upper cap 2 is first assembled in the first stage, so that the lower cap 4 and the upper cap 2 are connected to each other as a single component 24. In this case, the single component 24 is not easy to be separated into the lower cap 4 and the upper cap 2 during transport or movement.

[0093] The upper cap 2 is provided with a window 201 and a window 202 on two sides. During assembly of the lower cap 4 and the upper cap 2 in the first stage, a force toward the upper cap 2 is applied to the bottom of the lower cap 4, causing the columnar structure 4p1 to go deep into the upper cap 2. The force applied to the lower cap 4 can make the buckle protrusion 4d2 and the buckle protrusion 4d4 of the columnar structure 4p1 respectively reach inside the window 201 and the window 202.

[0094] The buckle protrusion 4d2 may include inclined surfaces 421 and 422, to help to enable the columnar structure 4p1 to run through a bottom edge 2e1 and go deep into the upper cap 2. The buckle protrusion 4d4 may include inclined surfaces 441 and 442, to help to enable the columnar structure 4p1 to run through a bottom edge 2e2 and go deep into the upper cap 2.

[0095] After the buckle protrusion 4d2 reaches the window 201, the thin protrusion 4d1 of the columnar structure 4p1 abuts against the bottom edge 2e1 of the upper cap 2, and the buckle protrusion 4d2 of the columnar structure 4p1 abuts against a surface 201s of the window 201. Similarly, after the buckle protrusion 4d4 reaches the window 202, the thin protrusion 4d3 of the columnar structure 4p1 abuts against the bottom edge 2e2 of the upper cap 2, and the buckle protrusion 4d4 of the columnar structure 4p1 abuts against a surface 202s of the window 202. After the first stage of the assembly, the lower cap 4 and the upper cap 2 are connected to each other as a single component 24, which facilitates the second stage of the assembly after all the components of the cartridge 100A are transported to the destination.

[0096] As shown in FIG. 8, after the first stage of the assembly, the columnar structure 4p1 still does not completely go deep into the valve structure 2v1, so that a gap that can let fluid pass through is still maintained between the columnar structure 4p1 and the valve structure 2v1.

[0097] The thin protrusion 4d1 may have a thickness 4w1. In some embodiments, the thickness 4w1 may be within a range of 0.35 mm to 0.65 mm. In some embodiments, the thickness 4w1 may be within a range of 0.38mm to 0.41mm. The thin protrusion 4d3 may have the same thickness as that of the thin protrusion 4d1.

[0098] FIG. 9A is a schematic assembly diagram of a cartridge according to some embodiments of this application. FIG. 9A is a schematic diagram showing the second stage of the assembly of a cartridge 100A.

[0099] FIG. 9A shows a lower cap 4, an upper cap 2, and a cartridge housing 1. It should be noted that, for the sake of simplicity of description, the aerosol generation component 3, the attractive component 5a, and the attractive component 5b are not shown in FIG. 9A. The

foregoing components should be included during actual component of the cartridge 100A.

[0100] As mentioned in the related paragraphs of FIG. 8 above, the lower cap 4 and the upper cap 2 is first assembled in the first stage, so that the lower cap 4 and the upper cap 2 are connected to each other as a single component 24, which facilitates the second stage of the assembly after the single component 24 is transported to the destination.

[0101] As shown in FIG. 9A, during the second stage of the assembly, the cartridge housing 1 is filled with e-liquid 1001, and then a part of the single component 24 is pushed into the cartridge housing 1, so that the single component 24 and the cartridge housing 1 are fixed to each other. When the single component 24 and the cartridge housing 1 are not fixed to each other, there is a gap/passage between the valve structure 2v1 of the upper cap 2 and the columnar structure 4p1 of the lower cap 4. During the assembly process of the single component 24 and the cartridge housing 1, the passage between the valve structure 2v1 and the columnar structure 4p1 can make gases in the cartridge housing 1 be discharged along a path 2f1, thereby preventing excessive internal pressure of the cartridge 100A after the assembly. Similarly, the passage between the valve structure 2v2 and the columnar structure 4p2 can make gases in the cartridge housing 1 be discharged along a path 2f2, thereby preventing excessive internal pressure of the cartridge 100A after the assembly. The excessive internal pressure of the cartridge 100A may cause e-liquid leakage, reduce the yield rate of the product, and may alternatively cause bad user experience.

[0102] Referring to FIG. 8 and FIG. 9A, in the second stage of the assembly of the cartridge 100A, the thin protrusion 4d1 and the thin protrusion 4d3 of the columnar structure 4p1 also play important roles. During the second stage of the assembly process, the lower cap 4 may be continuously applied with a force towards the cartridge housing 1 until the top sealing structure 2t of the upper cap 2 abuts against the staircase structure 1d in the cartridge housing 1 (referring to FIG. 7A).

[0103] When the lower cap 4 is continuously applied with the force, the thin protrusion 4d1 may transmit the applied force to the upper cap 2 through the bottom edge 2e1 of the upper cap 2 to ensure that the upper cap 2 may reach a predetermined position in the cartridge housing 1. Similarly, during the second stage of the assembly process, the thin protrusion 4d3 may transmit the applied force to the upper cap 2 through the bottom edge 2e2 of the upper cap 2 to ensure that the upper cap 2 may reach the predetermined position in the cartridge housing 1.

[0104] FIG. 9B is a cross-sectional view of a cartridge according to some embodiments of this application. FIG. 9B is a cross-sectional view of a cartridge 100A after being assembled. It should be noted that, for the sake of simplicity of description, the metal structure 6a, the metal structure 6b, the attractive component 5a, and the attrac-

tive component 5b are not shown in FIG. 9B. After the cartridge 100A is assembled, the foregoing components should be included.

[0105] As shown in FIG. 9B, when the lower cap 4 and the upper cap 2 are fixed at predetermined positions in the cartridge housing 1, the valve structure 2v1 and the columnar structure 4p1 are closely attached, and the valve structure 2v2 and the columnar structure 4p2 are closely attached. The valve structure 2v1 surrounds a part of the columnar structure 4p1 and exposes a top surface 4p1s of the columnar structure 4p1. The valve structure 2v2 surrounds a part of the columnar structure 4p2 and exposes a top surface 4p2s of the columnar structure 4p2.

[0106] After the cartridge 100A is assembled, the valve structure 2v1 becomes a one-way ventilation valve. After the cartridge 100A is assembled, the valve structure 2v1 can function as both a one-way valve and a ventilation valve.

[0107] After the cartridge 100A is assembled, the pressure in the storage compartment 10 may be slightly greater than the pressure in the vaporization chamber 40, and in this case, the pressure in the storage compartment 10 can make the elastic structure 2p1 attach the columnar structure 4p1, or make the elastic structure 2p1 move toward the columnar structure 4p1. Similarly, the pressure in the storage compartment 10 can make the elastic structure 2p2 attach to the columnar structure 4p2, or make the elastic structure 2p2 move toward the columnar structure 4p2.

[0108] As a one-way valve, the valve structure 2v1 can prevent the e-liquid in the storage compartment 10 from leaking out of the storage compartment 10 from between the valve structure 2v1 and the columnar structure 4p1. As a one-way valve, the valve structure 2v2 can prevent the e-liquid in the storage compartment 10 from leaking out of the storage compartment 10 from between the valve structure 2v2 and the columnar structure 4p2.

[0109] After continuous use of the cartridge 100A by the user, the volume of the e-liquid in the storage compartment 10 is continuously reduced, resulting in a continuous decrease in the pressure in the storage compartment 10. The decrease in the pressure in the storage compartment 10 may make the e-liquid not easy to flow toward the aerosol generation component 3. The decrease in the pressure in the storage compartment 10 may make the aerosol generation component 3 unable to fully absorb the e-liquid, resulting in a burnt or bitter taste during the heating process.

[0110] When a pressure difference between the pressure in the storage compartment 10 and the pressure in the vaporization chamber 40 reaches a threshold, air in the vaporization chamber 40 may push the elastic structure 2p1 of the valve structure 2v1 through a path 4f1 and enter the storage compartment 10 to balance the pressure of the storage compartment 10 and the vaporization chamber 40. When the pressure difference between the pressure in the storage compartment 10 and

the pressure in the vaporization chamber 40 reaches the threshold, the air in the vaporization chamber 40 may push the elastic structure 2p1 to make the elastic structure 2p1 move away from the columnar structure 4p1.

The air in the vaporization chamber 40 may deform the elastic structure 2p1 such that the elastic structure 2p1 is not in contact with the columnar structure 4p1.

[0111] Similarly, when the pressure difference between the pressure in the storage compartment 10 and the pressure in the vaporization chamber 40 reaches the threshold, the air in the vaporization chamber 40 may push the elastic structure 2p2 of the valve structure 2v2 through a path 4f2 and enter the storage compartment 10 to balance the pressure of the storage compartment 10 and the vaporization chamber 40. The air in the vaporization chamber 40 may push the elastic structure 2p2 to make the elastic structure 2p2 move away from the columnar structure 4p2. The air in the vaporization chamber 40 may deform the elastic structure 2p2 such that the elastic structure 2p2 is not in contact with the columnar structure 4p2.

[0112] As a ventilation valve, the valve structure 2v1 may reduce the probability of dry burning when the cartridge 100A produces heat, and is beneficial for the user to fully use the e-liquid in the storage compartment 10. As a ventilation valve, the valve structure 2v2 may reduce the probability of dry burning when the cartridge 100A produces heat, and is beneficial for the user to fully use the e-liquid in the storage compartment 10.

[0113] FIG. 9C is a cross-sectional view of a cartridge according to some embodiments of this application. FIG. 9C is a cross-sectional view of a cartridge 100A including an upper cap 2' after being assembled. It should be noted that, for the sake of simplicity of description, the metal structure 6a, the metal structure 6b, the attractive component 5a, and the attractive component 5b are not shown in FIG. 9C. After the cartridge 100A is assembled, the foregoing components should be included.

[0114] When the lower cap 4 and the upper cap 2' are fixed at predetermined positions in the cartridge housing 1, a valve structure 2v1' and the columnar structure 4p2 are closely attached. After the cartridge 100A is assembled, the valve structure 2v1' becomes a one-way ventilation valve. After continuous use of the cartridge 100A by the user, the volume of the e-liquid in the storage compartment 10 is continuously reduced, resulting in a continuous decrease in the pressure in the storage compartment 10. When the difference between the pressure in the storage compartment 10 and the pressure in the vaporization chamber 40 reaches the threshold, the air in the vaporization chamber 40 may push an elastic structure 2p1' of the valve structure 2v1' through a path 4f1' and then enter the storage compartment 10 to balance the pressure of the storage compartment 10 and the vaporization chamber 40. As a ventilation valve, the valve structure 2v1' may reduce the probability of dry burning when the cartridge 100A produces heat, and is beneficial for the user to fully use the e-liquid in the storage com-

partment 10. As a one-way valve, the valve structure 2v1' can prevent the e-liquid in the storage compartment 10 from leaking out of the storage compartment 10 from between the valve structure 2v1' and the columnar structure 4p2.

[0115] As shown in FIG. 9C, the upper cap 2' includes the valve structure 2v1' only on one side thereof, and includes a cavity 2c on the other side thereof. The cavity 2c may accommodate the columnar structure 4p1 of the lower cap 4. Only containing a single valve structure 2v1' may lower the manufacturing cost of the upper cap 2'. Only containing a single valve structure 2v1' may reduce the manufacturing difficulty of the upper cap 2'. Only containing a single valve structure 2v1' may improve a yield rate of the upper cap 2'.

[0116] FIG. 9D is a cross-sectional view of an upper cap and a lower cap according to some embodiments of this application. FIG. 9D shows relative positions of the upper cap 2 and the lower cap 4 after the cartridge 100A is assembled in the second stage. For the sake of simplicity of descriptions, a drawing of the cartridge housing 1 is omitted in FIG. 9D.

[0117] When the lower cap 4 reaches a default position in the upper cap 2, the thin protrusion 4d1 and the thin protrusion 4d3 deform due to extrusion. As shown in FIG. 9D, the thin protrusion 4d1 deforms into a protruding portion 4d1' when reaching the default position in the upper cap 2, and abuts against an inner side surface 2s1 of the upper cap 2. The thin protrusion 4d3 deforms into a protruding portion 4d3' when reaching the default position in the upper cap 2, and abuts against an inner side surface 2s2 of the upper cap 2.

[0118] Extending directions of the inclined surface 421 and the columnar structure 4p1 may include an included angle θ_{421} , and extending directions of the inclined surface 422 and the columnar structure 4p1 may include an included angle θ_{422} . In some embodiments, the included angle θ_{421} may be the same as the included angle θ_{422} . In some embodiments, the included angle θ_{421} may be different from the included angle θ_{422} . In some embodiments, the included angle θ_{421} may be in a range of 10° to 25° . In some embodiments, the included angle θ_{422} may be in a range of 15° to 20° .

[0119] Extending directions of the inclined surface 441 and the columnar structure 4p1 may include an included angle θ_{441} , and extending directions of the inclined surface 442 and the columnar structure 4p1 may include an included angle θ_{442} . In some embodiments, the included angle θ_{441} may be the same as the included angle θ_{442} . In some embodiments, the included angle θ_{441} may be different from the included angle θ_{442} . In some embodiments, the included angle θ_{441} may be in a range of 10° to 25° . In some embodiments, the included angle θ_{442} may be in a range of 15° to 20° .

[0120] After the cartridge 100A is assembled in the second stage, the columnar structure 4p1 and the valve structure 2v1 are in contact with each other. After the cartridge 100A is assembled in the second stage, the

valve structure 2v1 surrounds and contacts the columnar structure 4p1. After the cartridge 100A is assembled in the second stage, the valve structure 2v1 functions as a one-way ventilation.

[0121] FIG. 10A and FIG. 10B are schematic diagrams of relative positions of a metal structure and an aerosol generation component according to some embodiments of this application.

[0122] FIG. 10A is a side surface view of the aerosol generation component 3 and the metal structure 6a.

[0123] The metal structure 6a and the lower cap 4 are formed by integral injection molding (referring to FIG. 6A), and therefore, the metal structure 6a is embedded in the lower cap 4. During the assembly process of the cartridge 100A, the metal structure 6a contacts the bottom of the aerosol generation component 3 as the lower cap 4 is placed in the cartridge housing 1. To describe a relative relationship between the aerosol generation component 3 and the metal structure 6a more clearly, the lower cap 4 is omitted in FIG. 10A.

[0124] The elastic sheet structure 61 of the metal structure 6a may include a plurality of parts. The elastic sheet structure 61 may include the plurality of parts that are connected to each other. The elastic sheet structure 61 may include a plurality of sections that are connected to each other. As shown in FIG. 10A, the elastic sheet structure 61 may include a section 61s1, a section 61s2, a section 61s3, and a section 61s4.

[0125] The section 61s1 and the section 61s2 are connected to each other. The section 61s2 and the section 61s3 are connected to each other. The section 61s3 and the section 61s4 are connected to each other. A connection between the section 61s3 and the section 61s4 includes a contact 61t1. A connection between the section 61s2 and the section 61s3 includes a contact 61t2. A connection between the section 61s1 and the section 61s2 includes a contact 61t3.

[0126] The contact 61t1, the contact 61t2, and the contact 61t3 may alternatively be referred to as a bending section respectively.

[0127] In some embodiments, the contact 61t1, the contact 61t2, and the contact 61t3 may have different radius of curvatures. Generally, the larger the radius of curvature, the smaller the curvature, or vice versa. In some embodiments, the radius of curvature of the contact 61t1 is less than the radius of curvature of the contact 61t2. In some embodiments, the radius of curvature of the contact 61t2 is less than the radius of curvature of the contact 61t3. In some embodiments, the radius of curvature of the contact 61t1 may be approximately 0.8 mm. In some embodiments, the radius of curvature of the contact 61t2 may be approximately 0.7 mm. In some embodiments, the radius of curvature of the contact 61t3 may be approximately 2 mm.

[0128] The section 61s1, the section 61s2, the section 61s3, and the section 61s4 may respectively have different extending directions. The extending direction of the section 61s1 is different from the extending directions of

the section 61s2, the section 61s3, and the section 61s4. The extending direction of the section 61s2 is different from the extending directions of the section 61s3 and the section 61s4. The extending direction of the section 61s3 is different from the extending direction of the section 61s4.

[0129] The section 61s1 extends in the y-axis direction as shown in FIG. 10A. An included angle θ_1 is formed between the section 61s2 and the section 61s1 (that is, the y-axis direction). An included angle θ_2 is formed between the section 61s3 and the y-axis direction.

[0130] In some embodiments, the included angle θ_1 is within a range of 60° to 75° . In some embodiments, the included angle θ_1 is within a range of 65° to 70° . In some embodiments, the included angle θ_2 is within a range of 10° to 30° . In some embodiments, the included angle θ_2 is within a range of 15° to 25° .

[0131] During the assembly process of the cartridge 100A, the metal structure 6a moves upward along the y-axis direction shown in FIG. 10A to contact the aerosol generation component 3. After being in contact with the metal structure 6a, the aerosol generation component 3 applies a downward force F_y along the y-axis direction to the elastic sheet structure 61 from the contact 61t1. The elastic sheet structure 61 deforms after receiving the force F_y . Different sections of the elastic sheet structure 61 displace along different directions after receiving the force F_y .

[0132] Referring to FIG. 10A, after receiving the force F_y , the section 61s2 moves rightward along the x-axis direction, and after receiving the force F_y , the section 61s3 moves leftward along the x-axis direction.

[0133] In detail, after the elastic sheet structure 61 receives the force F_y , the section 61s2 moves downward along the y-axis direction, causing the contact 61t2 to move rightward along the x-axis direction. In addition, the section 61s3 moves downward along the y-axis direction, causing the contact 61t1 to move leftward along the x-axis direction.

[0134] In some embodiments, a displacement length of the contact 61t1 caused by the force F_y is approximately the same as a displacement length of the contact 61t2 caused by the force F_y . Therefore, when the elastic sheet structure 61 receives the force F_y , the leftward displacement of the contact 61t1 may approximately offset the rightward displacement of the contact 61t2.

[0135] In some embodiments, when the elastic sheet structure 61 receives the force F_y , a difference between the displacement length of the contact 61t1 and the displacement length of the contact 61t2 may be within a range of 0.05 mm to 0.15 mm. In some embodiments, when the elastic sheet structure 61 receives the force F_y , a difference between the displacement length of the contact 61t1 and the displacement length of the contact 61t2 may be within a range of 0.2 mm to 0.65 mm.

[0136] FIG. 10B is a three-dimensional view of the aerosol generation component 3 and the metal structure 6a. When the elastic sheet structure 61 and the aerosol gen-

eration component 3 are assembled into the cartridge 100A, the contact 61t1 and a contact point 31p1 of the heating element 31 are in contact with each other.

[0137] During the assembly process, the included angle θ_1 between the section 61s1 and the section 61s2 and the included angle θ_2 between the section 61s3 and the y-axis direction may ensure that the contact 61t1 falls within a range of the contact point 31p1, thereby avoiding a poor contact between the elastic sheet structure 61 and the heating element 31. The poor contact between the elastic sheet structure 61 and the heating element 31 may cause the cartridge 100A fail to receive power provided by the body 100B.

[0138] In some embodiments, the contact point 31p1 may be disposed at the center of the width of the bottom of the aerosol generation component 3. In some embodiments, when the elastic sheet structure 61 and the aerosol generation component 3 are assembled into the cartridge 100A, the contact 61t1 may be located at the center of the width of the bottom of the aerosol generation component 3.

[0139] Similarly, although not drawn in FIG. 10B, the elastic sheet structure 63 (referring to 6A) may have the same appearance as the elastic sheet structure 61, thereby also ensuring that the elastic sheet structure 63 properly contacts a contact point 31p2 during the assembly process.

[0140] In some embodiments, the contact point 31p1 may have a length greater than 1.35 mm. In some embodiments, the contact point 31p1 may have a length greater than 1.17 mm. In some embodiments, the width of the contact point 31p1 may be within a range of 1.0 mm to 1.5 mm. The contact point 31p2 may have the same shape and the same dimension as the contact point 31p1.

[0141] In some embodiments, the contact 61t1 may have the width of 0.7 mm. In some embodiments, a ratio of the width of the contact point 31p1 to the width of the contact 61t1 may be within a range of 1 to 1.5.

[0142] As shown in FIG. 10B, the section 61s1 may have a width 61d1. The section 61s2 may have a width 61d2. The section 61s3 may have a width 61d3. The section 61s4 may have a width 61d4. In some embodiments, each of the plurality of sections of the elastic sheet structure 61 may have different widths. In some embodiments, the width 61d1 may be greater than the width 61d2. In some embodiments, the width 61d2 may be greater than the width 61d3. In some embodiments, the width 61d3 may be greater than the width 61d4. In some embodiments, the width of the elastic sheet structure 61 may gradually decrease from the section 61s1 to 61s4. In some embodiments, after the elastic sheet structure 61 is straightened upward, the elastic sheet structure 61 may have a trapezoidal shape.

[0143] FIG. 11 is a schematic diagram of a front surface of an upper cap according to some embodiments of this application. The upper cap 2" may include a top sealing structure 2t", a body 2m", and a bottom sealing structure

2b. The top sealing structure 2t" may have a material similar to that of the top sealing structure 2t shown in FIG. 3A. The body 2m" may have a material similar to that of the body 2m shown in FIG. 3A. The upper cap 2" and the upper cap 2' or the upper cap 2' may be compatible components with each other. In the cartridge 100A, the upper cap 2", the upper cap 2' or the upper cap 2' may be selected to combine with other components without affecting the functional integrity of the cartridge 100A.

[0144] The body 2m" of the upper cap 2' has an opening 2d. The opening 2d may alternatively be referred to as a window 2d. The opening 2d includes edges 2d1, 2d2, 2d3, and 2d4. The edges 2d1, 2d2, 2d3, and 2d4 may alternatively be referred to as side walls 2d1, 2d2, 2d3, and 2d4. The opening 2d may be disposed on a side surface of the body 2m". The opening 2d may be disposed on a side surface of the upper cap 2". The opening 2d may expose a side wall of the aerosol generation component 3. The opening 2d may expose most of the side walls of the aerosol generation component 3. In the process of using the vaporization device, the aerosol generation component 3 may have a higher temperature than the body 2m". The opening 2d may reduce a contact area between the aerosol generation component 3 and the body 2m". The opening 2d may reduce a chance of generating a condensed liquid when the aerosol generation component 3 is in contact with the body 2m".

[0145] The body 2m" includes a protruding portion 2a1 and a protruding portion 2a2. The protruding portion 2a1 and the protruding portion 2a2 may extend downward from the side wall 2d1 of the opening 2d. The protruding portion 2a1 and the protruding portion 2a2 may extend from the side wall 2d1 of the opening 2d toward a center of the opening 2d. The protruding portion 2a1 and the protruding portion 2a2 may extend from the side wall 2d1 of the opening 2d toward the side wall 2d3. The protruding portion 2a1 and the protruding portion 2a2 may be disposed on two sides of an opening 2k. An aerosol generated by the aerosol generation component 3 may enter the tube 1t of the cartridge housing 1 through the opening 2k, and then be inhaled by the user.

[0146] In the process of using the cartridge 100A, the aerosol generated by the aerosol generation component 3 may condense in the body 2m". The condensed aerosol may accumulate in an upper left corner of the opening 2d (that is, between the side wall 2d1 and the side wall 2d2) or an upper right corner (that is, between the side wall 2d1 and the sidewall 2d4). When the user performs inhalation, the protruding portion 2a1 and the protruding portion 2a2 may prevent the condensed liquid in the body 2m" from entering the opening 2k. The protruding portion 2a1 and the protruding portion 2a2 may prevent the condensed liquid in the body 2m" from being inhaled into the mouth of the user, resulting in a bad experience of choking. A length of the protruding portion 2a1 and a length of the protruding portion 2a2 may be longer than a longitudinal length of the opening 2k, to better prevent the condensed liquid from entering the opening 2k.

[0147] The body 2m" further includes one or more notches 2g disposed on two sides. The condensed liquid generated in the process of using the cartridge 100A may accumulate in the notch 2g. The condensed liquid in the body 2m" may be stored in the notch 2g, thereby reducing the probability of leakage of the condensed liquid to the outside of the cartridge 100A.

[0148] The body 2m" includes one or more notches 2j disposed on one side thereof. The notch 2j may reduce the thickness of a right side of the body 2m", and prevent the body 2m" from shrinking/deforming during the curing process, that may affect the yield rate of the body 2m". The notch 2j may store the condensed liquid in the body 2m". The notch 2j may reduce the probability of the condensed liquid in the body 2m" entering the opening 2k.

[0149] FIG. 12A is a schematic diagram of a front surface of a top sealing structure according to some embodiments of this application. FIG. 12A is a schematic diagram of a front surface of the top sealing structure 2t". Although the top sealing structure 2t" is shown individually in FIG. 12A, the top sealing structure 2t" and the body 2m" may be considered as a single component. The top sealing structure 2t" may be a part of the upper cap 2". The top sealing structure 2t" includes a valve structure 2v1" only on one side thereof. The valve structure 2v1" is disposed asymmetrically in the top sealing structure 2t".

[0150] The valve structure 2v1" may be an elastic structure. The valve structure 2v1" may have elasticity. The valve structure 2v1" may have ductility. The valve structure 2v1" may include a first portion 2n1 and a second portion 2n2. The second portion 2n2 is connected to the top sealing structure 2t". The second portion 2n2 is connected to the body 2m". The first portion 2n1 of the valve structure 2v1" is not directly connected to the body 2m". The first portion 2n1 of the valve structure 2v1" is connected to the body 2m" through the second portion 2n2.

[0151] In some embodiments, the valve structure 2v1" may be modified, so that the valve structure 2v1" has a third portion and a fourth portion.

[0152] The fourth portion of the valve structure 2v1" may be connected to the cartridge housing 1. The third portion of the valve structure 2v1" may be connected to the cartridge housing 1 through the fourth portion of the valve structure 2v1".

[0153] The valve structure 2v1" may include skived portions 2L1 and 2L2. The skived portions 2L1 and 2L2 may extend from the first portion 2n1 toward the second portion 2n2. The skived portions 2L1 and 2L2 may have a thinner thickness than the first portion 2n1 (referring to FIG. 12C). The skived portions 2L1 and 2L2 may have a thinner thickness than the second portion 2n2 (referring to FIG. 12C). The skived portions 2L1 and 2L2 may be disposed on an outer surface of the valve structure 2v1". The skived portions 2L1 and 2L2 can enable the valve structure 2v1" to be easy to bend and deform, so that the valve structure 2v1" functions as a one-way air valve.

[0154] FIG. 12B is a cross-sectional view of a top seal-

ing structure according to some embodiments of this application.

[0155] The first portion 2n1 of the valve structure 2v1" may have a nonuniform thickness. The first portion 2n1 of the valve structure 2v1" may have a thickness nw1 at an end. A place in which the first portion 2n1 of the valve structure 2v1" is connected to the second portion 2n2 of the valve structure 2v1" may have a thickness nw2. In some embodiments, the thickness nw1 of the first portion 2n1 may be different from the thickness nw2 of the first portion 2n1. The thickness nw1 of the first portion 2n1 may be greater than the thickness nw2 of the first portion 2n1. The first portion 2n1 of the valve structure 2v1" has a thicker thickness at an end, so that the valve structure 2v1" has a better sealing effect.

[0156] The second portion 2n2 of the valve structure 2v1" may have a thickness nw3. The thickness nw3 of the second portion 2n2 of the valve structure 2v1" may be different from the thickness nw1 of the first portion 2n1 of the valve structure 2v1". The thickness nw3 of the second portion 2n2 of the valve structure 2v1" may be different from the thickness nw2 of the first portion 2n1 of the valve structure 2v1". The thickness nw3 of the second portion 2n2 of the valve structure 2v1" may be greater than the thickness nw1 of the first portion 2n1 of the valve structure 2v1". The thickness nw3 of the second portion 2n2 of the valve structure 2v1" may be greater than the thickness nw2 of the first portion 2n1 of the valve structure 2v1".

[0157] FIG. 12C is a three-dimensional top view of a top sealing structure according to some embodiments of this application. FIG. 12C is a three-dimensional top view of the top sealing structure 2t". The valve structure 2v1" includes an opening 2vt. The opening 2vt may alternatively be referred to as a hole. The opening 2vt may be considered as a hole of the upper cap 2". The opening 2vt may be considered as a hole of the body 2m".

[0158] The opening 2vt may be used for accommodating the columnar structure 4p1 of the lower cap 4. The opening 2vt may be used for accommodating the columnar structure 4p2 of the lower cap 4. The opening 2vt may be used for accommodating a columnar structure 4p1' of a lower cap 4'. The opening 2vt may be used for accommodating a columnar structure 4p2' of a lower cap 4'.

[0159] When the lower cap 4 and the upper cap 2" are assembled together, the columnar structure 4p1 of the lower cap 4 or the columnar structure 4p2 of the lower cap 4 may be disposed in the opening 2vt of the upper cap 2". When the lower cap 4' and the upper cap 2" are assembled together, the columnar structure 4p1' of the lower cap 4' or the columnar structure 4p2' of the lower cap 4' may be disposed in the opening 2vt of the upper cap 2".

[0160] An outer side of the valve structure 2v1" includes the skived portion 2L1, the skived portion 2L2, a skived portion 2L3, and a skived portion 2L4. In some embodiments, the valve structure 2v1" may include

more skived portions. In some embodiments, the valve structure 2v1" may include less skived portions. The skived portions 2L1, 2L2, 2L3, and 2L4 can enable the valve structure 2v1" to be easy to bend and deform, so that the valve structure 2v1" functions as a one-way air valve. As shown in FIG. 12C, the valve structure 2v1" further includes a skived portion 2L5 on an inner side of the opening 2vt. The skived portion 2L5 can enable the valve structure 2v1" to have a better ventilation effect.

[0161] FIG. 12D is a three-dimensional bottom view of a top sealing structure according to some embodiments of this application. FIG. 12C is a three-dimensional bottom view of the top sealing structure 2t". The skived portion 2L5 on an inner side of the valve structure 2v1" may be seen clearly from FIG. 12D. The skived portion 2L5 can enable the valve structure 2v1" to have a better ventilation effect.

[0162] FIG. 13A and FIG. 13B are three-dimensional views of a lower cap according to some embodiments of this application. FIG. 13A is a three-dimensional view of the lower cap 4'. The lower cap 4' and the lower cap 4 may be compatible components with each other. In the cartridge 100A, the lower cap 4' or the lower cap 4 may be selected to combine with other components without affecting the functional integrity of the cartridge 100A.

[0163] The lower cap 4' include the columnar structure 4p1' and the columnar structure 4p2'. The columnar structure 4p1' includes notches 4t1, 4t2, 4t3, and 4t4. The notch 4t1 and the notch 4t2 may extend toward different directions. The notch 4t1 and the notch 4t2 may communicate with each other. The notch 4t3 and the notch 4t4 may extend toward different directions. The notch 4t3 and the notch 4t4 may communicate with each other. When the lower cap 4' and the upper cap 2" are assembled together, the valve structure 2v1" of the upper cap 2" may cover the notch 4t1 and the notch 4t3. When the lower cap 4' and the upper cap 2" are assembled together, the valve structure 2v1" of the upper cap 2" may expose a part of the notch 4t2 and the notch 4t4. The notches 4t1, 4t2, 4t3, and 4t4 can enable the valve structure 2v1" to have a better ventilation effect.

[0164] The columnar structure 4p2' includes notches 4t5, 4t6, 4t7, and 4t8. The notch 4t5 and the notch 4t6 may extend toward different directions. The notch 4t5 and the notch 4t6 may communicate with each other. The notch 4t7 and the notch 4t8 may extend toward different directions. The notch 4t7 and the notch 4t8 may communicate with each other. The notches 4t5, 4t6, 4t7, and 4t8 of the columnar structure 4p2' may have a function similar to that of the notches 4t1, 4t2, 4t3, and 4t4 of the columnar structure 4p1'.

[0165] The columnar structure 4p2' further includes a notch 4u2. When the lower cap 4' and the upper cap 2" are assembled together, the valve structure 2v1" of the upper cap 2" may cover a part of the notch 4u2. When the lower cap 4' and the upper cap 2" are assembled together, the valve structure 2v1" of the upper cap 2" may expose a part of the notch 4u2. When the lower cap 4'

and the upper cap 2" are assembled together, a part of the notch 4u2 of the columnar structure 4p2' may be located between the valve structure 2v1" of the upper cap 2" and the columnar structure 4p2'. The notch 4u2 of the columnar structure 4p2' can enable the valve structure 2v1" to have a better ventilation effect.

[0166] FIG. 13B is a three-dimensional view from another angle of the lower cap 4'. As shown in FIG. 13B, the columnar structure 4p1' includes the notches 4t1, 4t2, 4t3, and 4t4, and the columnar structure 4p2' includes the notches 4t5, 4t6, 4t7, and 4t8. The columnar structure 4p1' further includes a notch 4u1. The notch 4u1 of the columnar structure 4p1' may have a function similar to that of the notch 4u2 of the columnar structure 4p2'. The notch 4u1 of the columnar structure 4p1' can enable the valve structure 2v1" to have a better ventilation effect.

[0167] FIG. 14A is a schematic assembly diagram of a cartridge according to some embodiments of this application. FIG. 14A is a schematic assembly diagram of the upper cap 2" and the lower cap 4'. To make the description of the features more clear, a drawing of the body 2m" is omitted in FIG. 14A. However, FIG. 14A is not meant to indicate that the top sealing structure 2t" and the body 2m" can be separated from each other. As shown in FIG. 14A, when the upper cap 2" and the lower cap 4' are assembled together, the valve structure 2v1" of the upper cap 2" may expose a part of the notch 4u1. When the upper cap 2" and the lower cap 4' are assembled together, the valve structure 2v1" of the upper cap 2" may expose a part of the notch 4t4.

[0168] FIG. 14B is an assembly cross-sectional view of a cartridge according to some embodiments of this application. FIG. 14B is an assembly cross-sectional view of the upper cap 2" and the lower cap 4'. To make the description of the features more clear, a drawing of the body 2m" is omitted in FIG. 14B. However, FIG. 14B is not meant to indicate that the top sealing structure 2t" and the body 2m" can be separated from each other. As shown in FIG. 14B, when the upper cap 2" and the lower cap 4' are assembled together, the valve structure 2v1" of the upper cap 2" may expose a part of the notch 4u1.

[0169] The first portion 2n1 of the valve structure 2v1" of the upper cap 2" may expose a top portion of the notch 4u1. The first portion 2n1 of the valve structure 2v1" of the upper cap 2" may expose a bottom portion of the notch 4u1.

[0170] As used herein, the terms "approximately", "basically", "substantially", "around", and "about" are used to describe and consider small variations. When used in combination with an event or a situation, the terms may refer to an example in which an event or a situation occurs accurately and an example in which the event or situation occurs approximately. As used herein with respect to a given value or range, the term "about" generally means in the range of $\pm 10\%$, $\pm 5\%$, $\pm 1\%$, or $\pm 0.5\%$ of the given value or range. The range may be indicated herein as from one endpoint to another endpoint or between two

endpoints. Unless otherwise specified, all ranges disclosed herein include endpoints. The term "substantially coplanar" may refer to two surfaces within a few micrometers (μm) positioned along the same plane, for example, within 10 μm , within 5 μm , within 1 μm , or within 0.5 μm positioned along the same plane. When reference is made to "substantially" the same numerical value or characteristic, the term may refer to a value within $\pm 10\%$, $\pm 5\%$, $\pm 1\%$, or $\pm 0.5\%$ of the average of the values.

[0171] As used herein, the terms "approximately", "basically", "substantially", and "about" are used to describe and explain small variations. When used in combination with an event or a situation, the terms may refer to an example in which an event or a situation occurs accurately and an example in which the event or situation occurs approximately. For example, when being used in combination with a value, the term may refer to a variation range of less than or equal to $\pm 10\%$ of the value, for example, less than or equal to $\pm 5\%$, less than or equal to $\pm 4\%$, less than or equal to $\pm 3\%$, less than or equal to $\pm 2\%$, less than or equal to $\pm 1\%$, less than or equal to $\pm 0.5\%$, less than or equal to $\pm 0.1\%$, or less than or equal to $\pm 0.05\%$. For example, if a difference between two values is less than or equal to $\pm 10\%$ of an average value of the value (for example, less than or equal to $\pm 5\%$, less than or equal to $\pm 4\%$, less than or equal to $\pm 3\%$, less than or equal to $\pm 2\%$, less than or equal to $\pm 1\%$, less than or equal to $\pm 0.5\%$, less than or equal to $\pm 0.1\%$, or less than or equal to $\pm 0.05\%$), it could be considered that the two values are "basically" or "about" the same. For example, being "basically" parallel may refer to an angular variation range of less than or equal to $\pm 10^\circ$ with respect to 0° , for example, less than or equal to $\pm 5^\circ$, less than or equal to $\pm 4^\circ$, less than or equal to $\pm 3^\circ$, less than or equal to $\pm 2^\circ$, less than or equal to $\pm 1^\circ$, less than or equal to $\pm 0.5^\circ$, less than or equal to $\pm 0.1^\circ$, or less than or equal to $\pm 0.05^\circ$. For example, being "basically" perpendicular may refer to an angular variation range of less than or equal to $\pm 10^\circ$ with respect to 90° , for example, less than or equal to $\pm 5^\circ$, less than or equal to $\pm 4^\circ$, less than or equal to $\pm 3^\circ$, less than or equal to $\pm 2^\circ$, less than or equal to $\pm 1^\circ$, less than or equal to $\pm 0.5^\circ$, less than or equal to $\pm 0.1^\circ$, or less than or equal to $\pm 0.05^\circ$.

[0172] For example, two surfaces can be deemed to be coplanar or basically coplanar if a displacement between the two surfaces is no greater than 5 μm , no greater than 2 μm , no greater than 1 μm , or no greater than 0.5 μm . A surface can be deemed to be planar or basically planar if a displacement between any two points on the surface with respect to a plane is no greater than 5 μm , no greater than 2 μm , no greater than 1 μm , or no greater than 0.5 μm .

[0173] As used herein, the terms "conductive", "electrically conductive" and "electrical conductivity" refer to an ability to transport an electric current. Electrically conductive materials typically indicate those materials that exhibit little or no opposition to the flow of an electric

current. One measure of electrical conductivity is Siemens per meter (S/m). Typically, an electrically conductive material is a material having a conductivity greater than approximately 10^4 S/m (such as at least 10^5 S/m or at least 10^6 S/m). The electrical conductivity of a material can sometimes vary with temperature. Unless otherwise specified, the electrical conductivity of a material is measured at room temperature.

[0174] As used herein, singular terms "a", "an", and "the" may include plural referents unless the context clearly dictates otherwise. In the description of some embodiments, assemblies provided "on" or "above" another component may encompass a case in which a previous component is directly on a latter component (for example, in physical contact with the latter component), and a case in which one or more intermediate assemblies are located between the previous component and the latter component.

[0175] As used herein, for ease of description, space-related terms such as "under", "below", "lower portion", "above", "upper portion", "lower portion", "left side", "right side", and the like may be used herein to describe a relationship between one component or feature and another component or feature as shown in the figures. In addition to orientation shown in the figures, space-related terms are intended to encompass different orientations of the device in use or operation. A device may be oriented in other ways (rotated 90 degrees or at other orientations), and the space-related descriptors used herein may also be used for explanation accordingly. It should be understood that when a component is "connected" or "coupled" to another component, the component may be directly connected to or coupled to another component, or an intermediate component may exist.

[0176] Several embodiments of the present disclosure and features of details are briefly described above. The embodiments described in the present disclosure may be easily used as a basis for designing or modifying other processes and structures for realizing the same or similar objectives and/or obtaining the same or similar advantages introduced in the embodiments in the specification. Such equivalent construction does not depart from the spirit and scope of the present disclosure, and various variations, replacements, and modifications can be made without departing from the spirit and scope of the present disclosure.

Claims

1. a vaporization component, comprising:

a base (2, 4);
a first hole (2h1) in the base; and
a valve structure (2v1), configured to open or close the first hole.

2. The vaporization component according to claim 1,

wherein the valve structure (2v1) is an elastic structure.

3. The vaporization component according to claim 1 or 2, wherein the valve structure (2v1) comprises a first portion (2n1) not connected to the base and a second portion (2n2) connected to the base.

4. The vaporization component according to claim 3, wherein the thickness of the first portion of the valve structure is nonuniform.

5. The vaporization component according to any of claim 1-4, wherein the valve structure comprises a skived portion (2L1) disposed on an outer surface.

6. The vaporization component according to claim 3 or 4, wherein the first portion of the valve structure (2v1) closes the first hole by contacting a first portion (4p1) of the base.

7. The vaporization component according to any of claim 3-6, wherein the first portion (4p1) of the base comprises a first notch (4u1), a first portion of the first notch being located between the first portion of the valve structure and the first portion of the base.

8. The vaporization component according to any of claim 3-6, wherein the first portion of the valve structure comprises a first opening (2vt), the first portion (4p1) of the base being disposed in the first opening.

9. The vaporization component according to any of claim 1-8, wherein the base further comprises a second opening (2d) provided on a side surface thereof.

10. The vaporization component according to claim 9, wherein the base further comprises a first protruding portion (2a1) extending out of a first side wall (2d1) of the second opening.

11. The vaporization component according to claim 9, wherein the base further comprises a first protruding portion, the first protruding portion extending from a first side wall of the second opening toward the center of the second opening.

12. A vaporization device, comprising:

a housing (1);
a base (2, 4);
a first hole (2h1) located between the housing and the base; and
a valve structure (2v1), configured to open or close the first hole.

13. The vaporization device according to claim 12, wherein the valve structure comprises a first portion

not connected to the base and a second portion connected to the base.

14. The vaporization device according to claim 13, wherein the thickness of the first portion of the valve structure is nonuniform. 5
15. The vaporization device according to any of claim 12-14, wherein the valve structure comprises a skived portion disposed on an outer surface. 10

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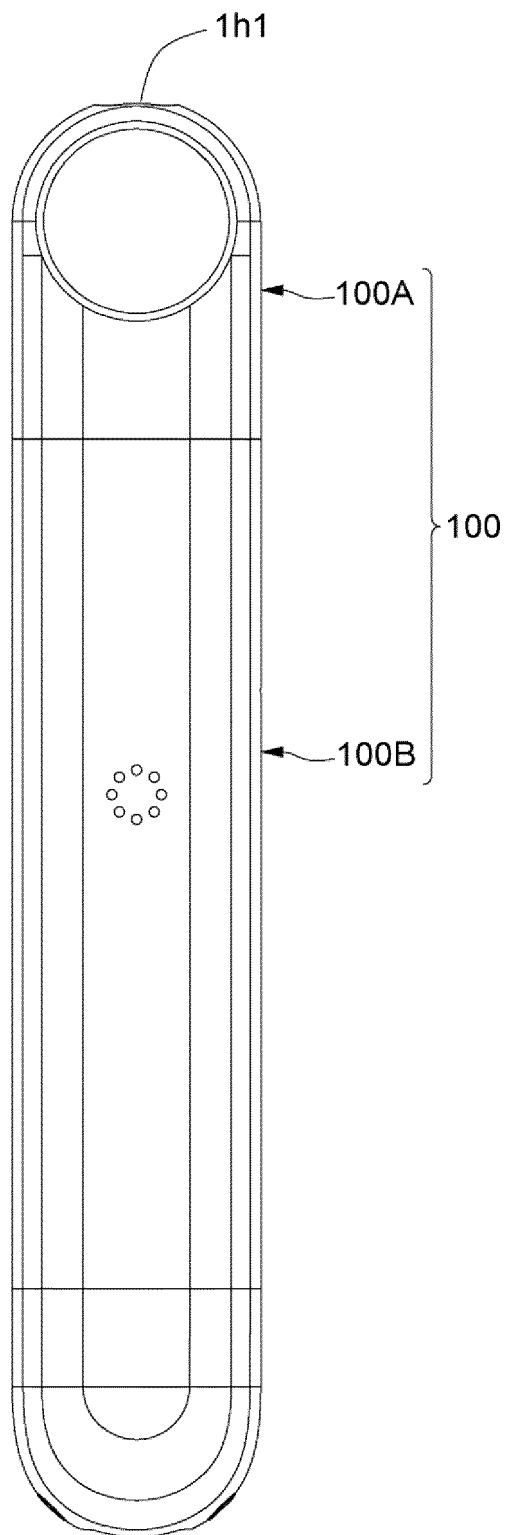


FIG. 1A

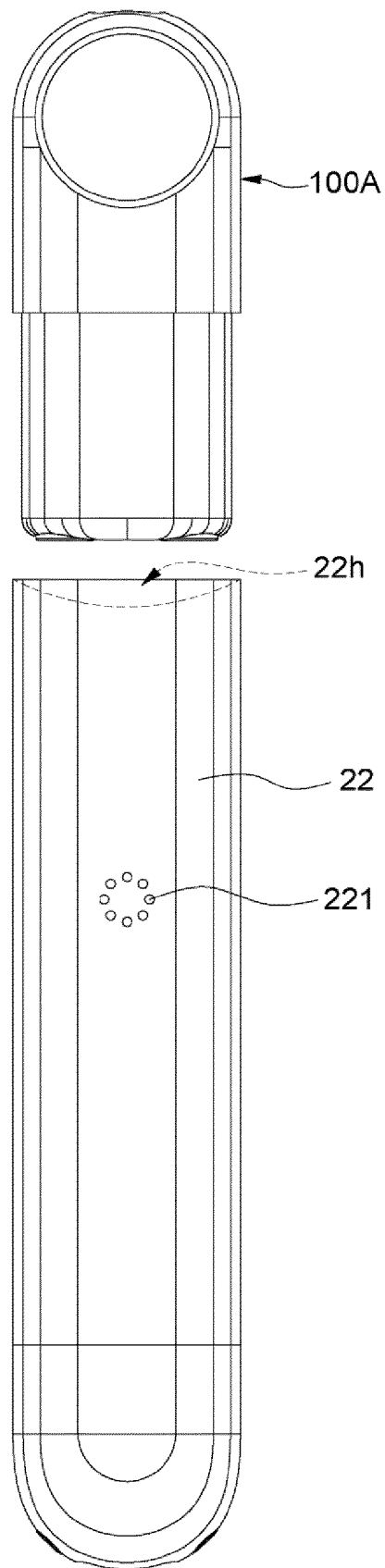


FIG. 1B

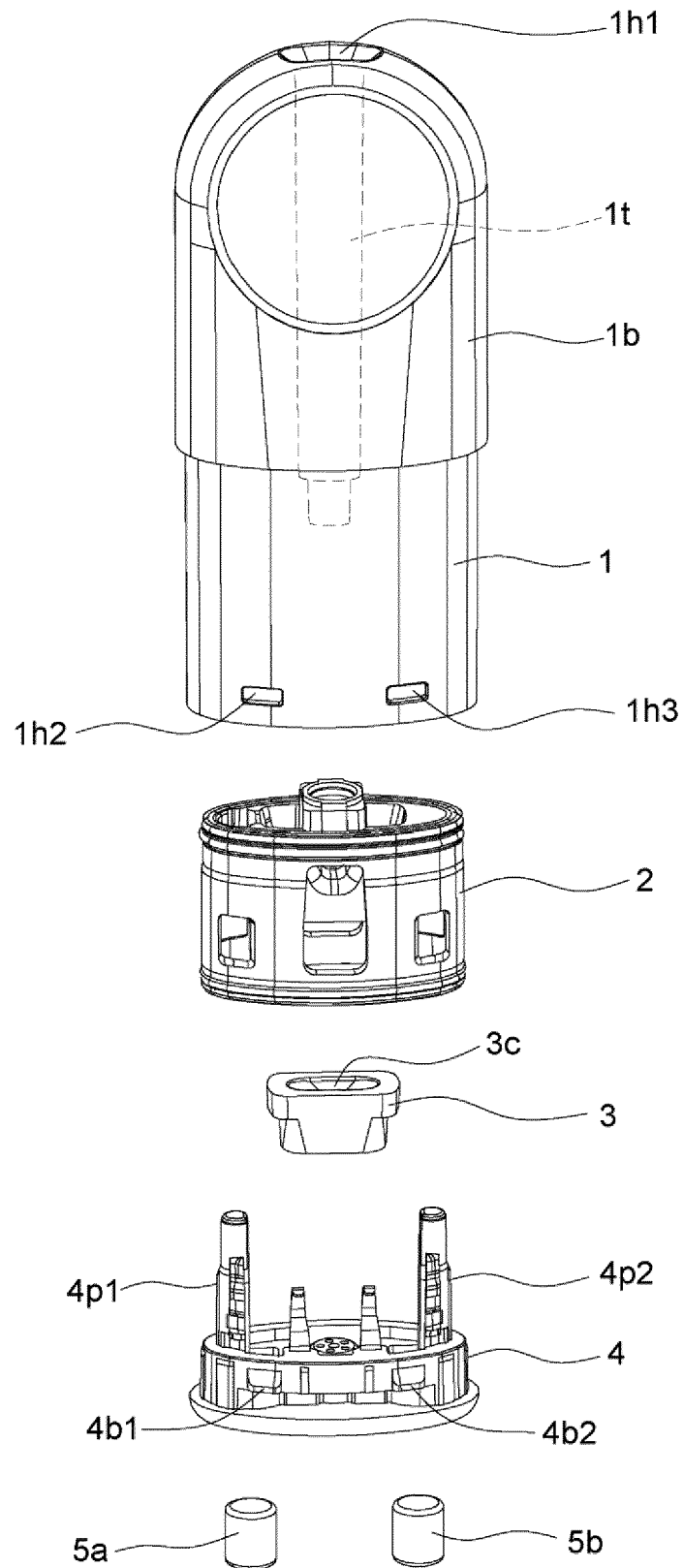


FIG. 2A

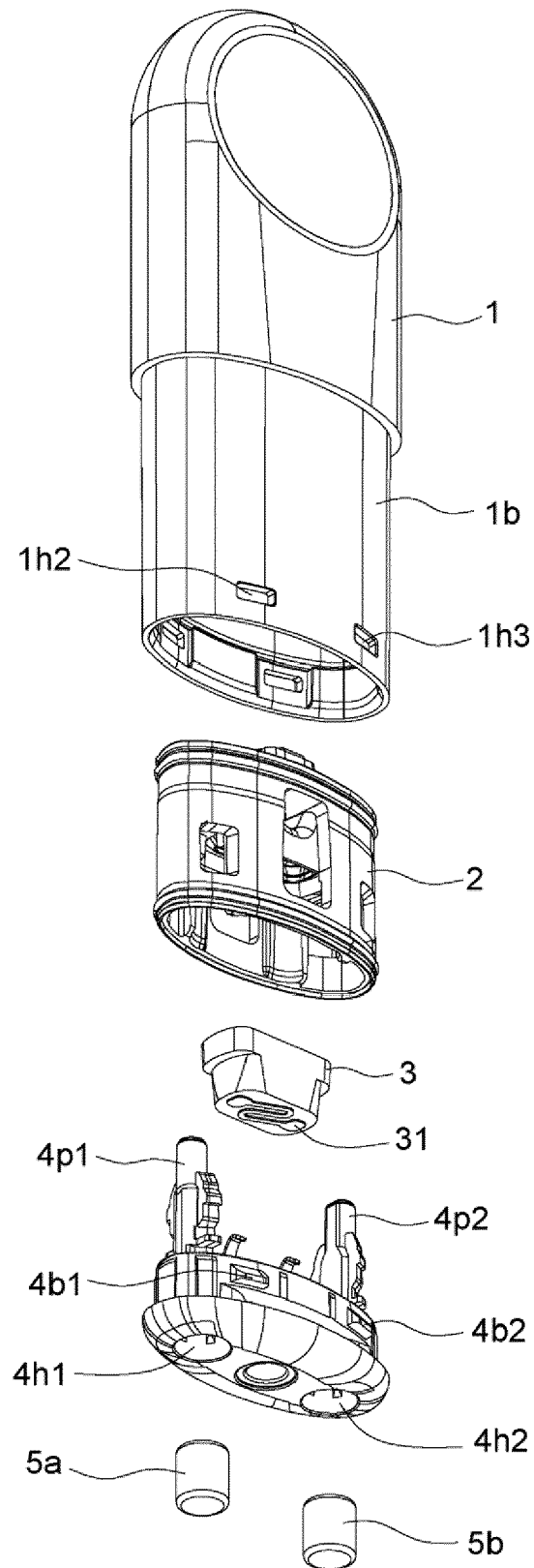


FIG. 2B

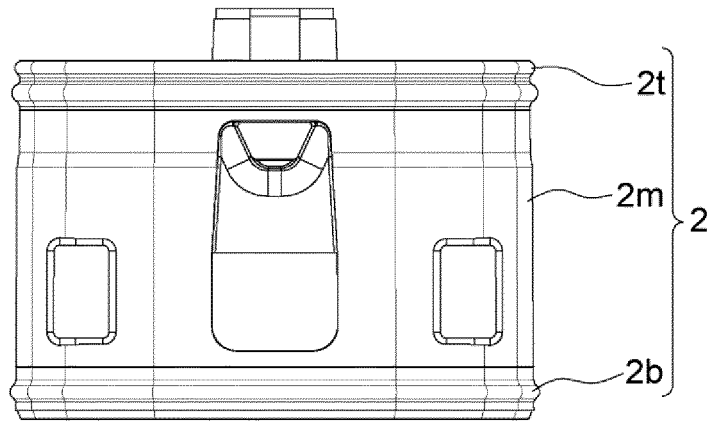


FIG. 3A

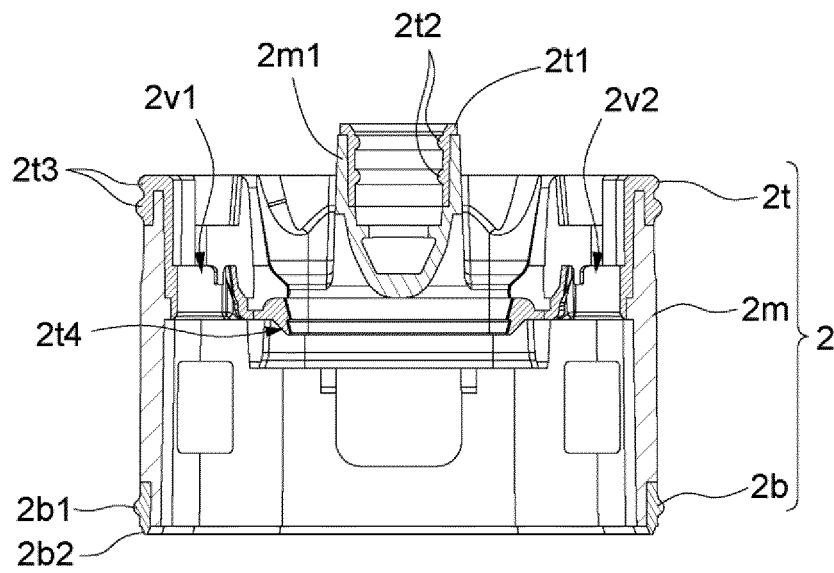


FIG. 3B

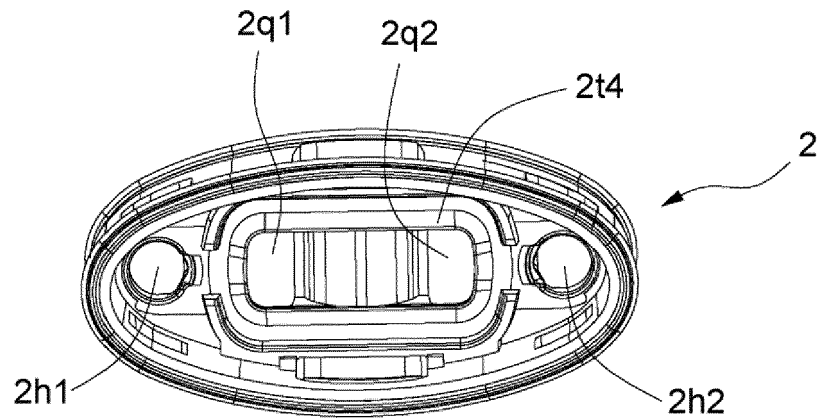


FIG. 3C

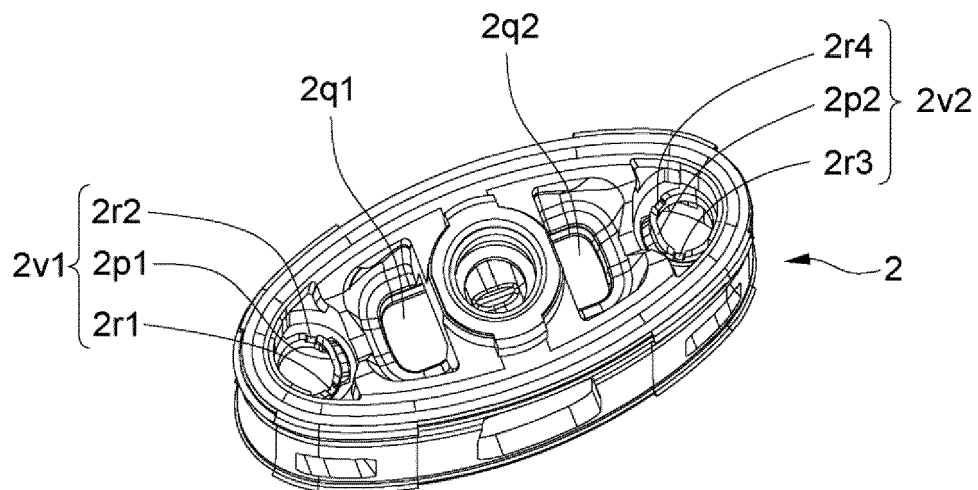


FIG. 3D

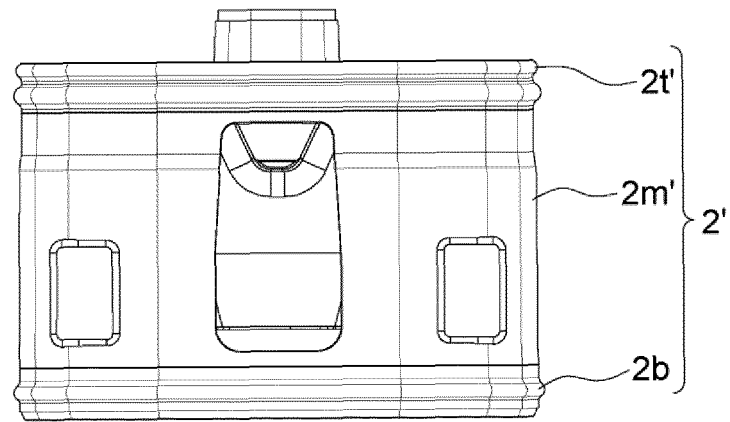


FIG. 4A

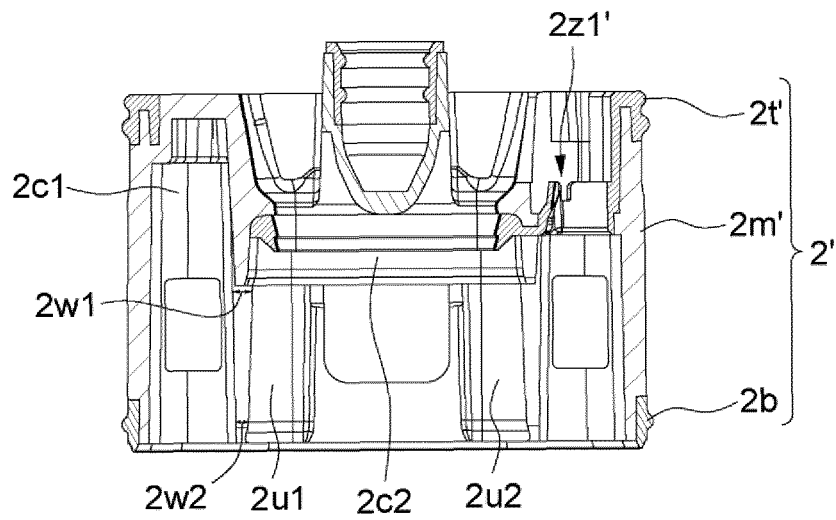


FIG. 4B

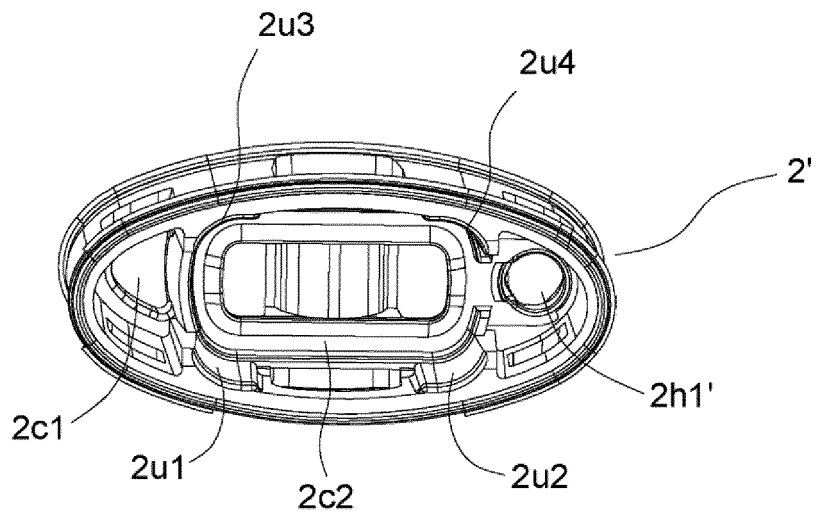


FIG. 4C

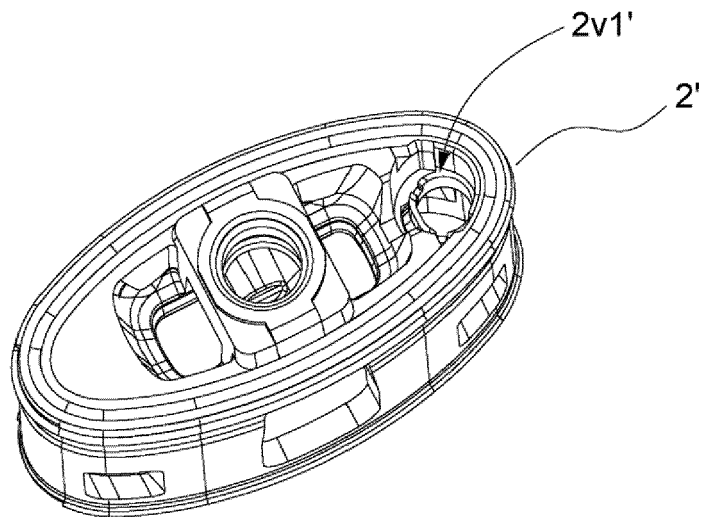


FIG. 4D

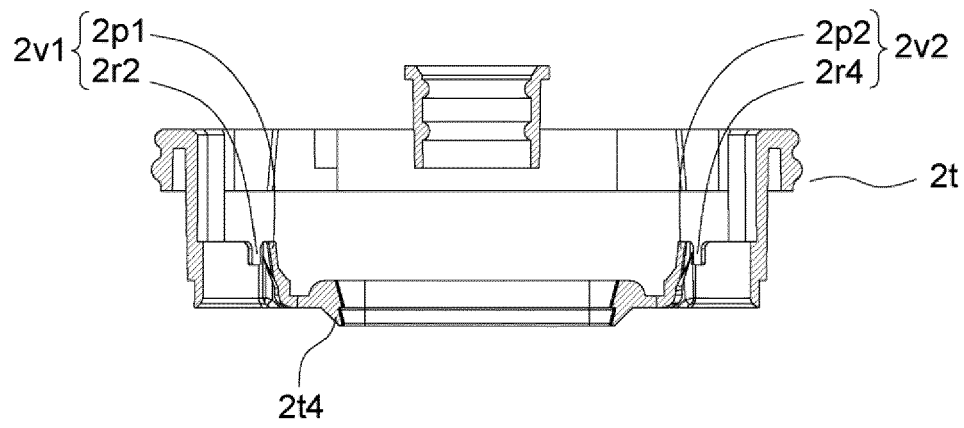


FIG. 5A

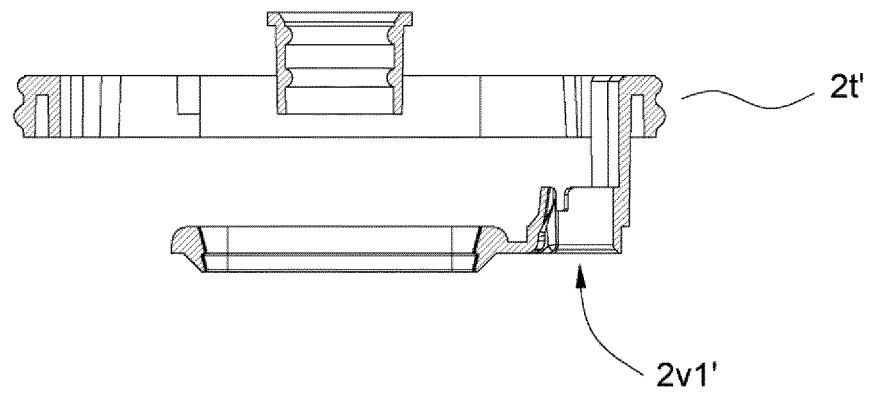


FIG. 5B

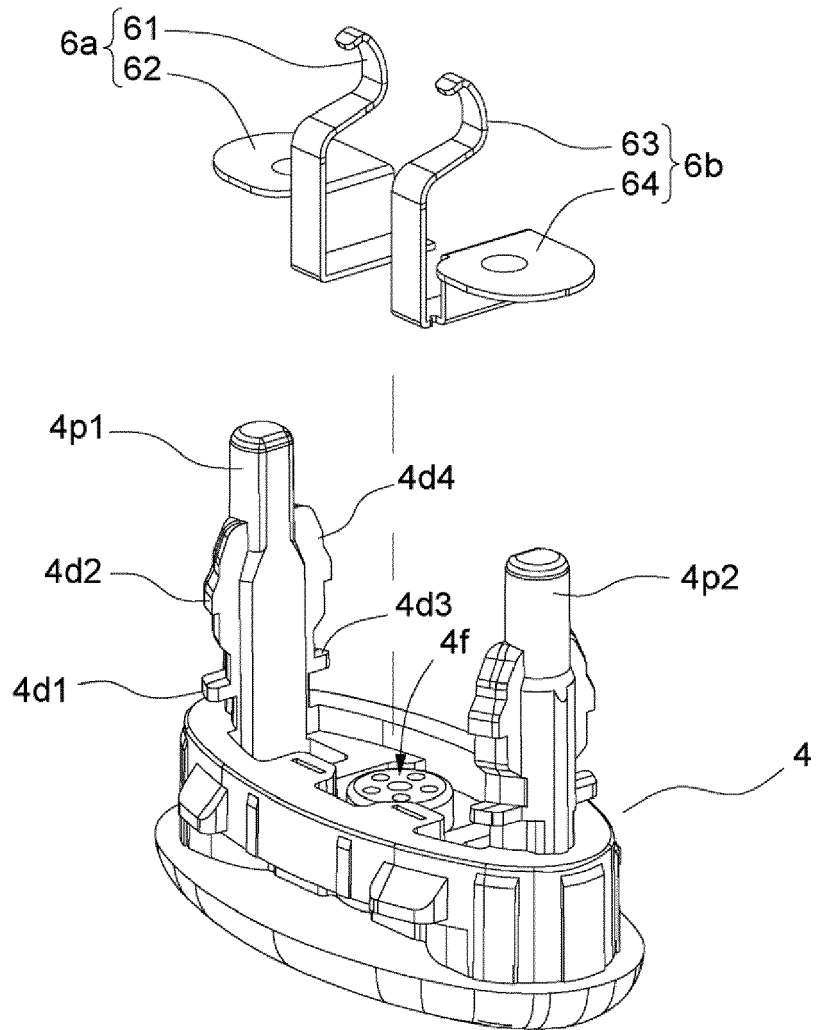


FIG. 6A

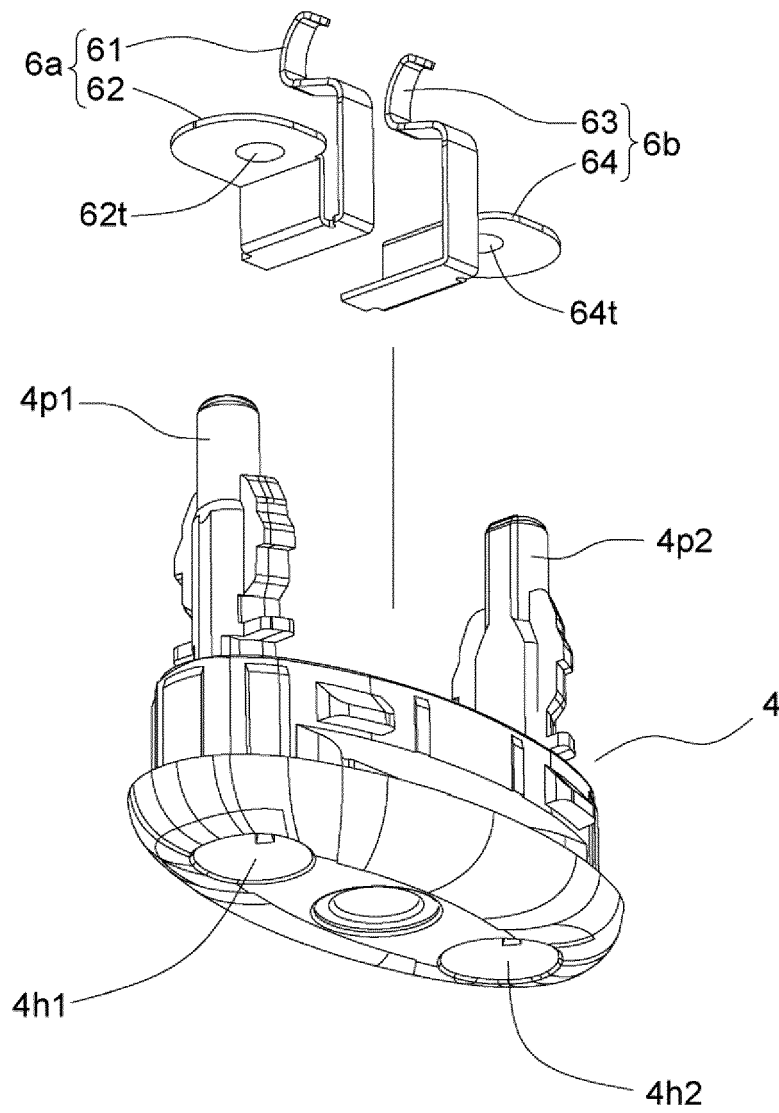


FIG. 6B

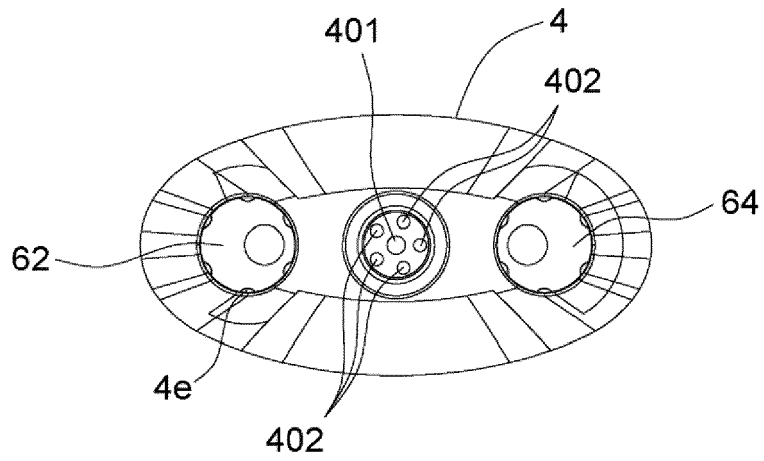


FIG. 6C

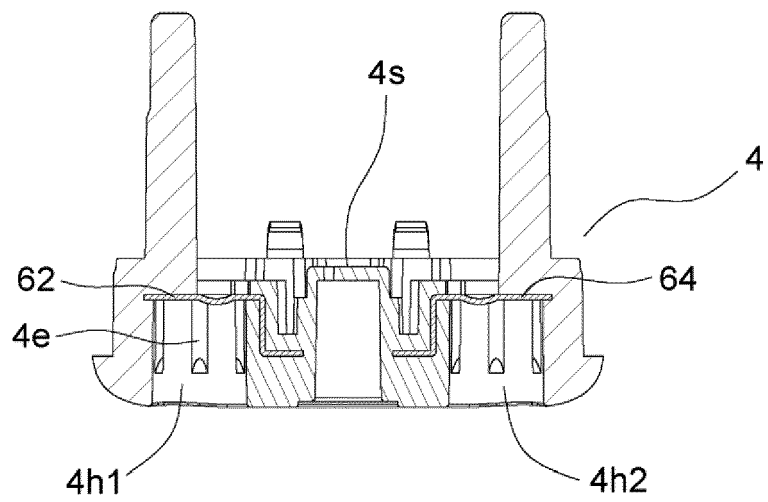


FIG. 6D

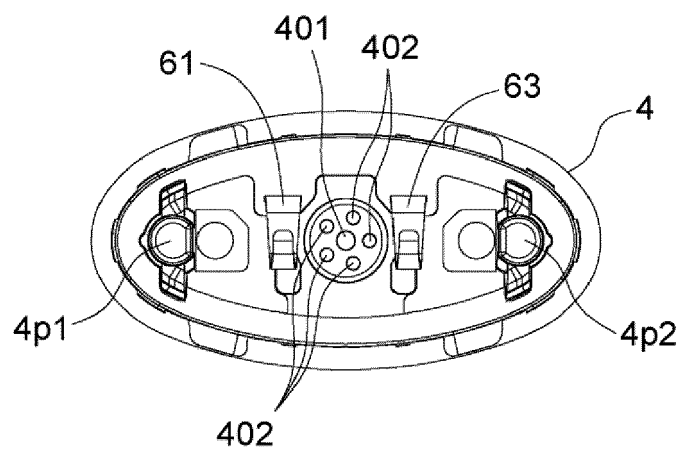


FIG. 6E

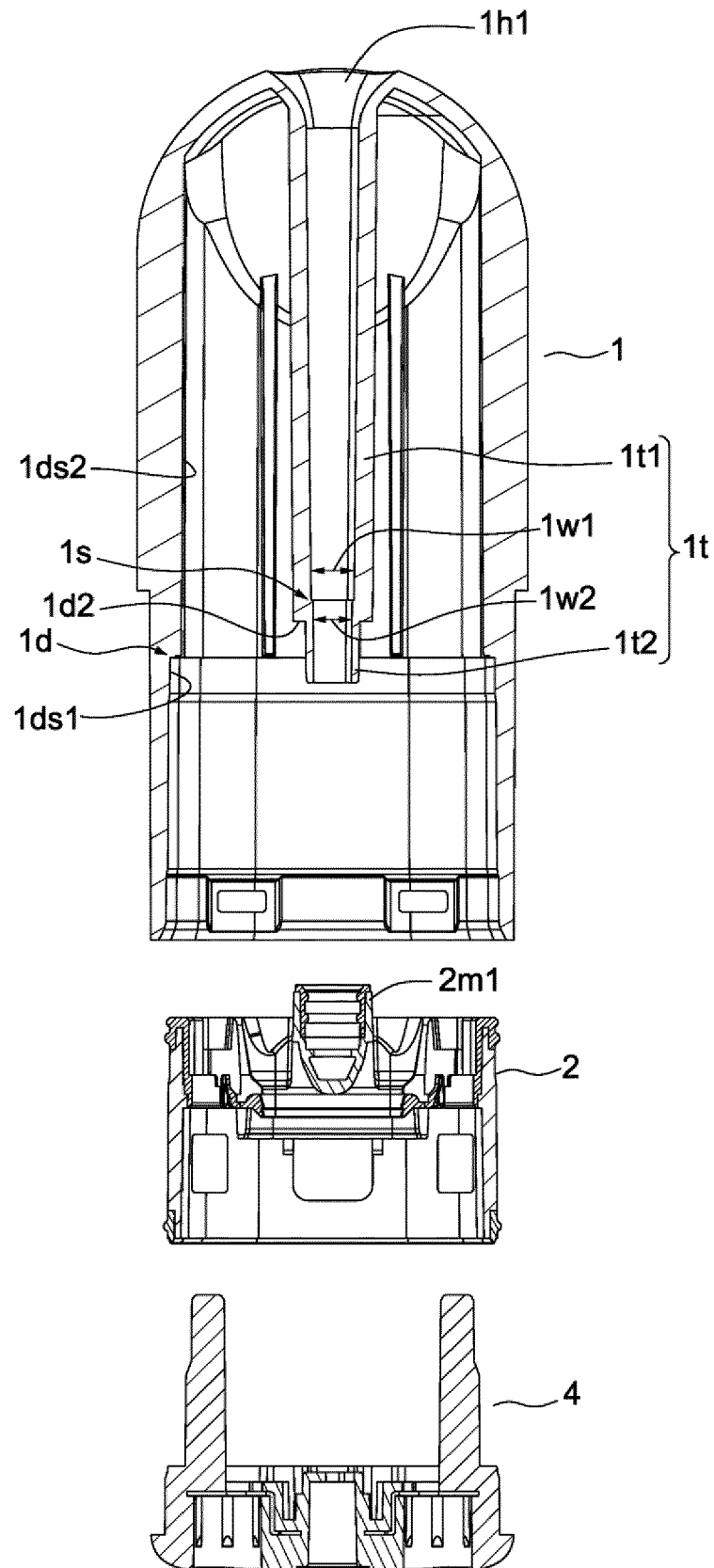


FIG. 7A

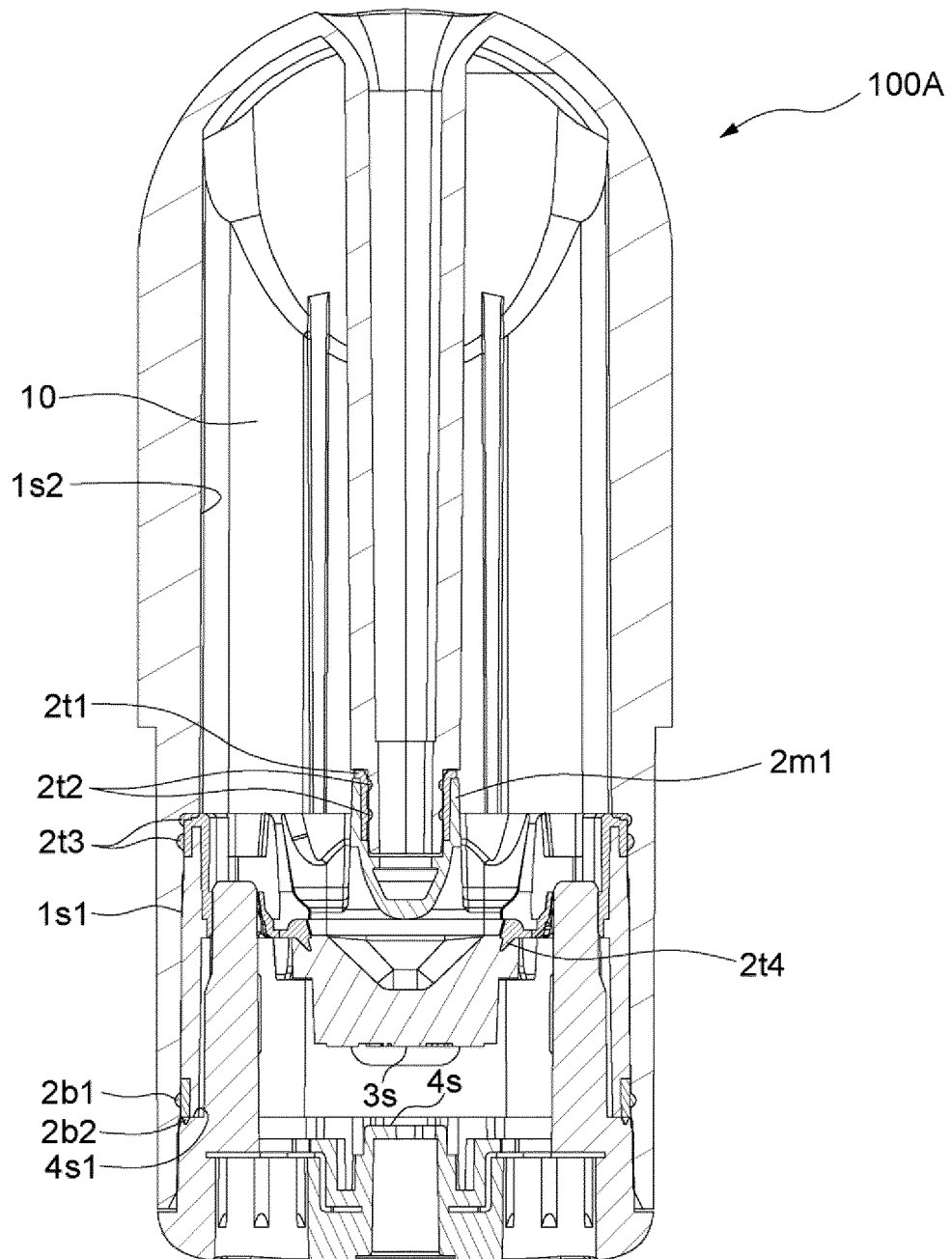


FIG. 7B

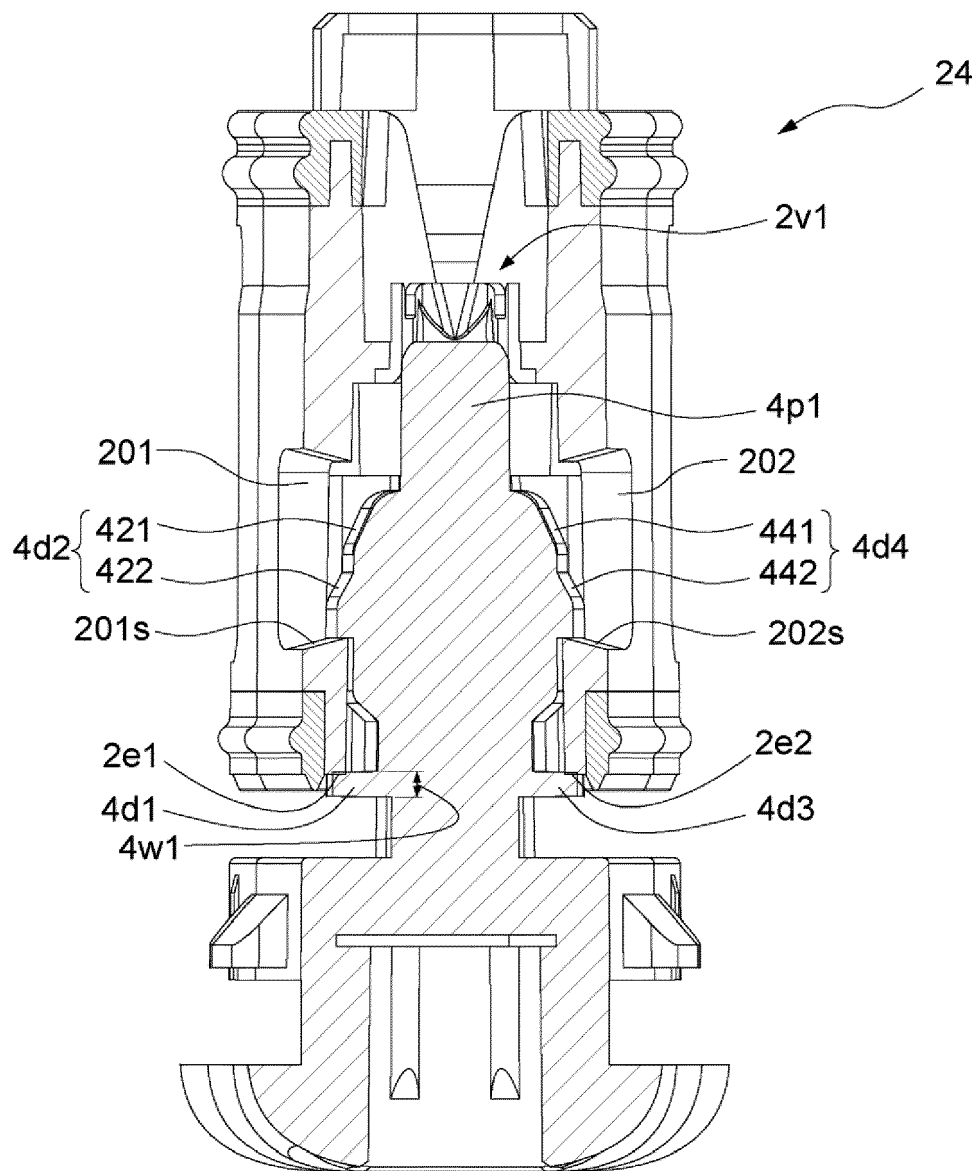
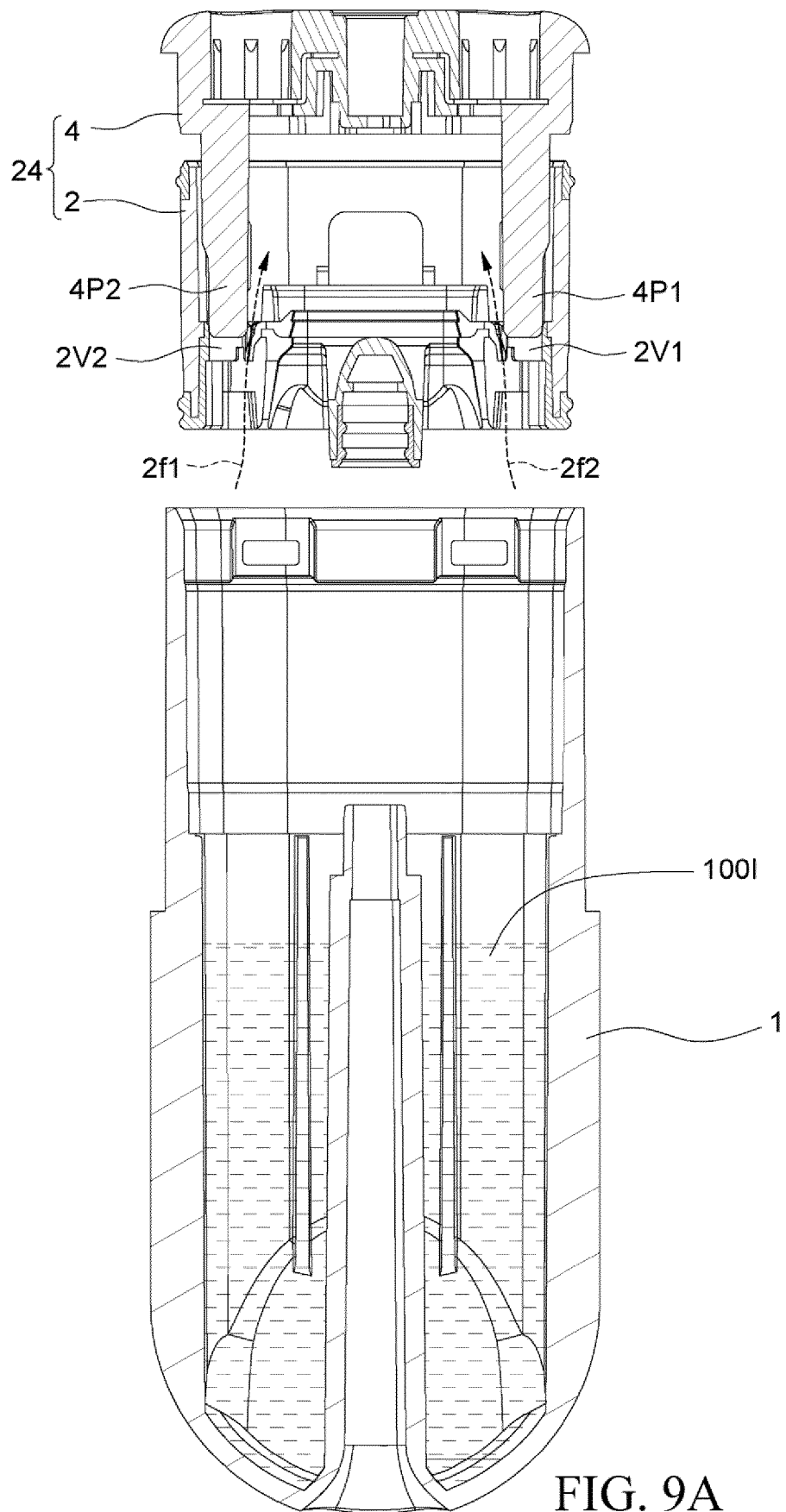


FIG. 8



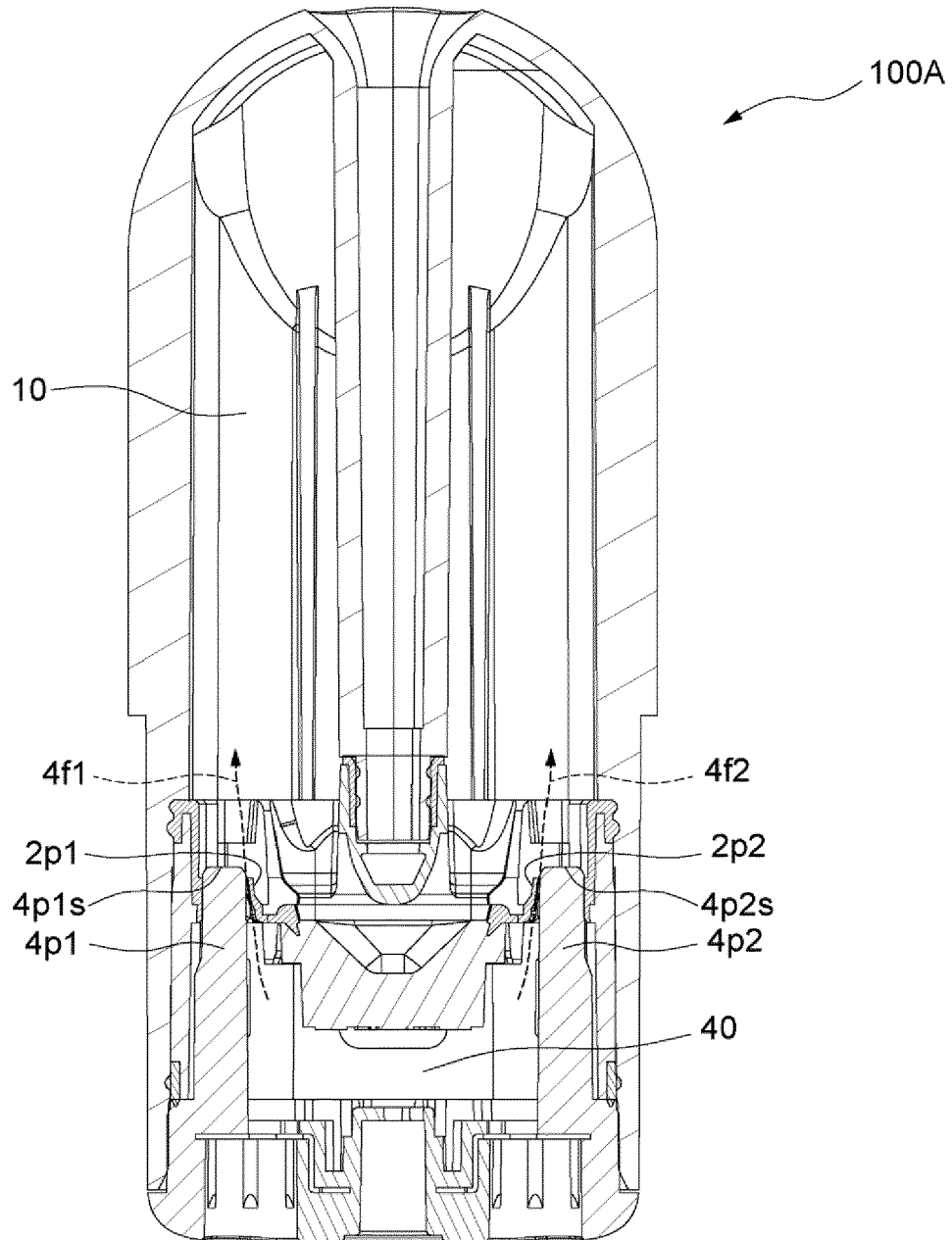


FIG. 9B

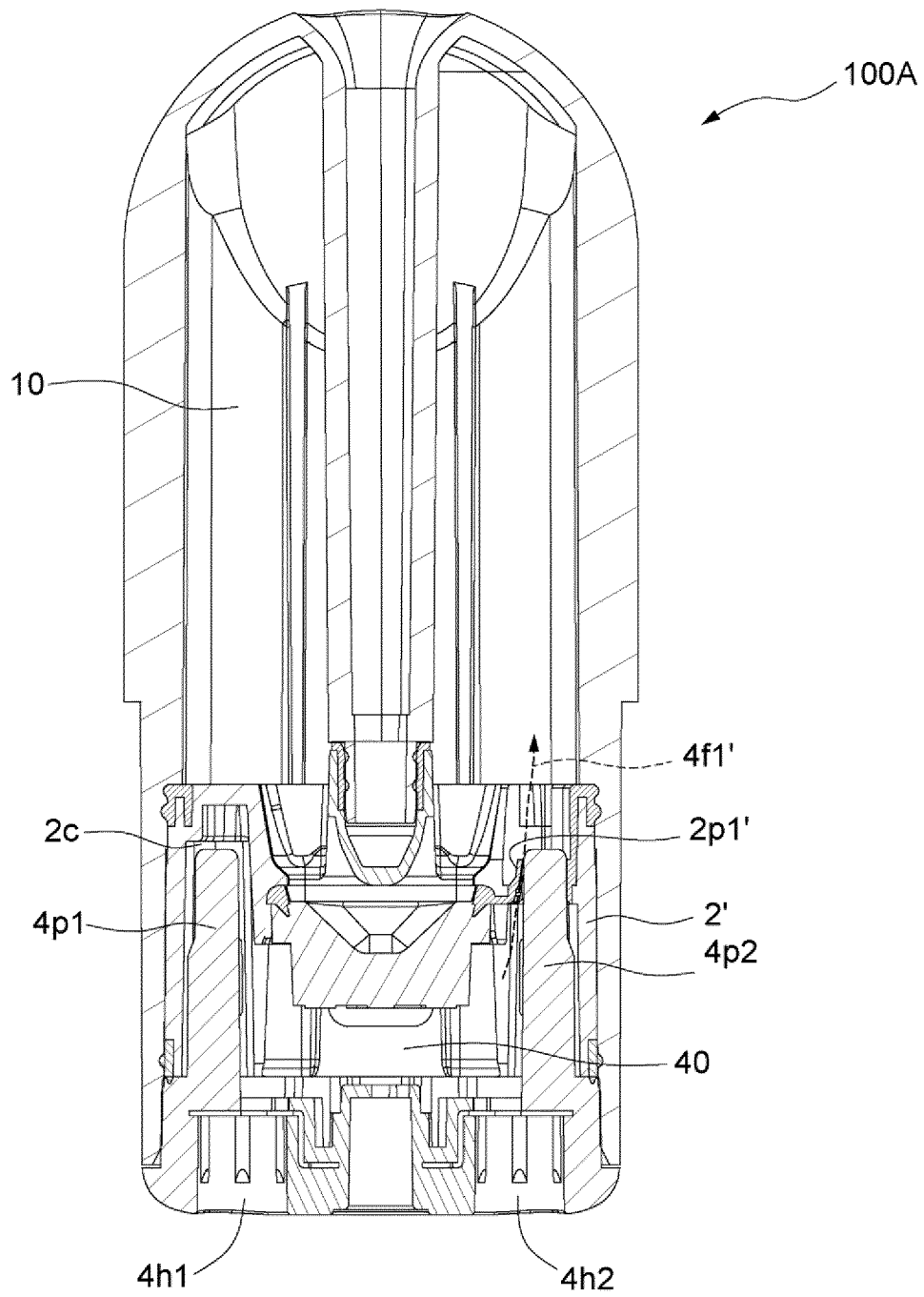


FIG. 9C

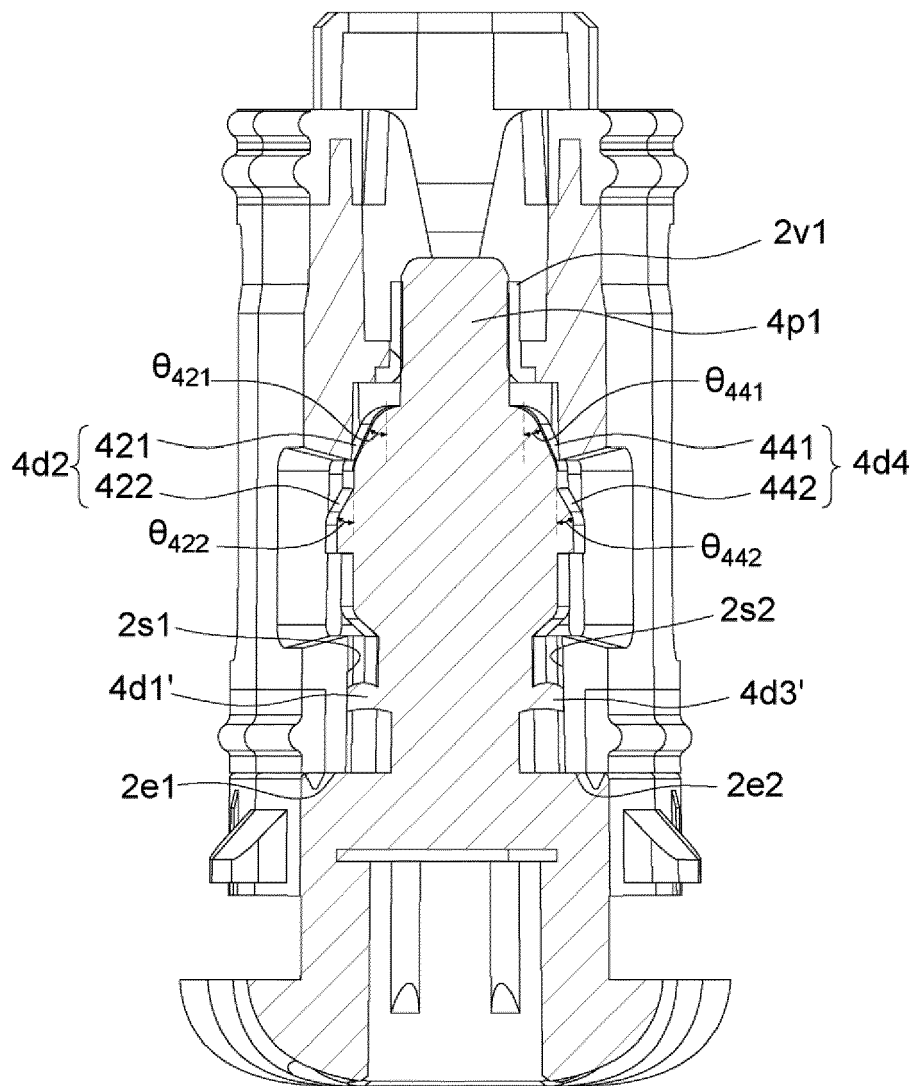


FIG. 9D

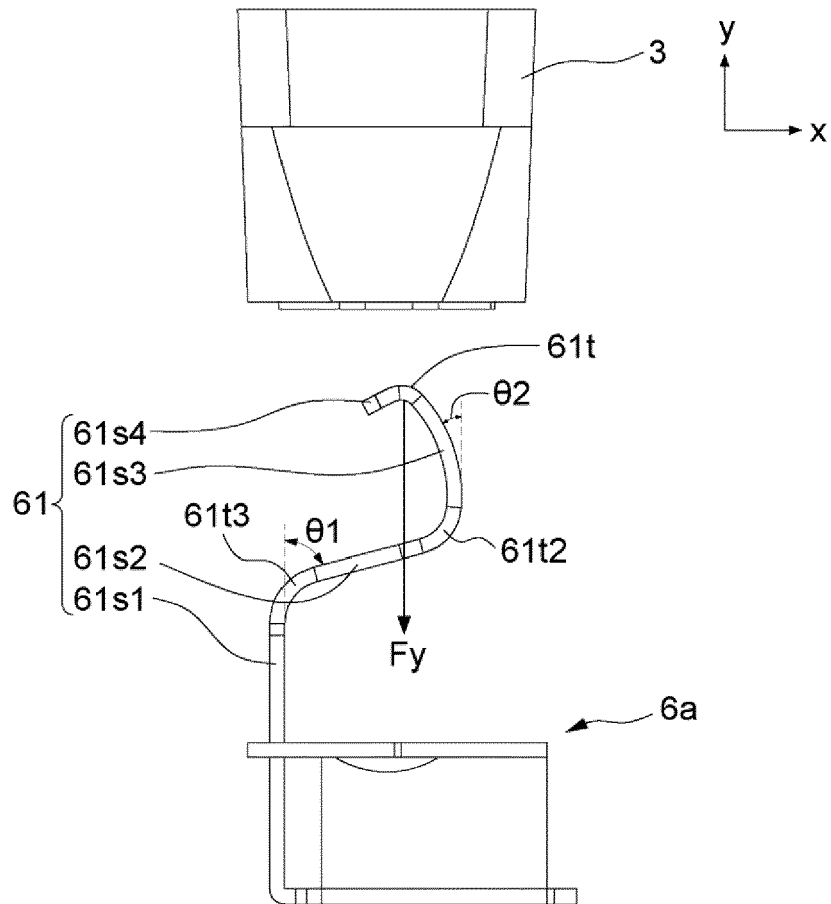


FIG. 10A

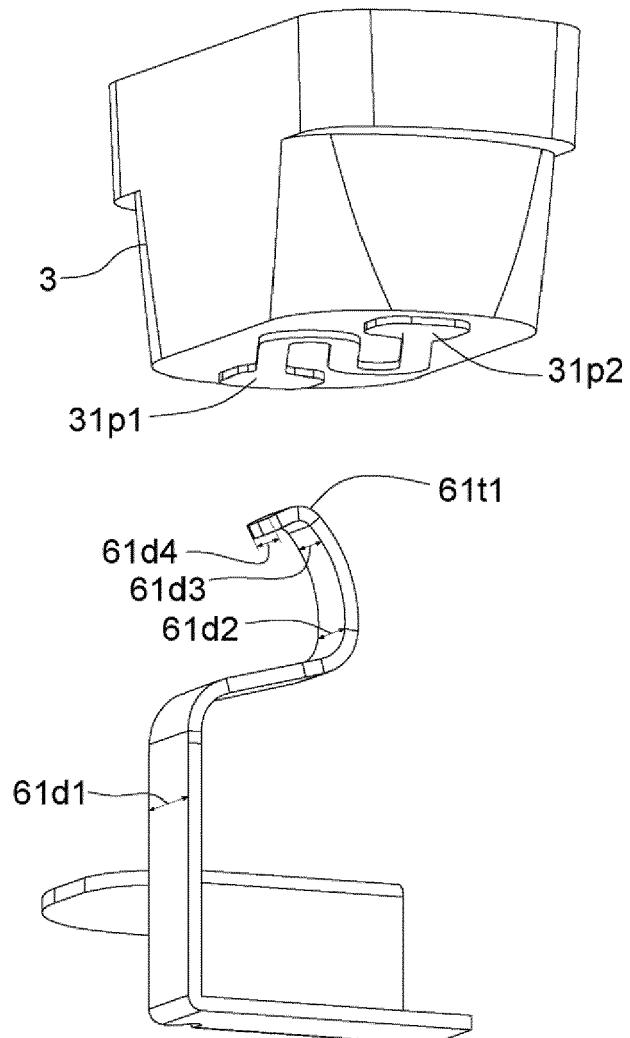


FIG. 10B

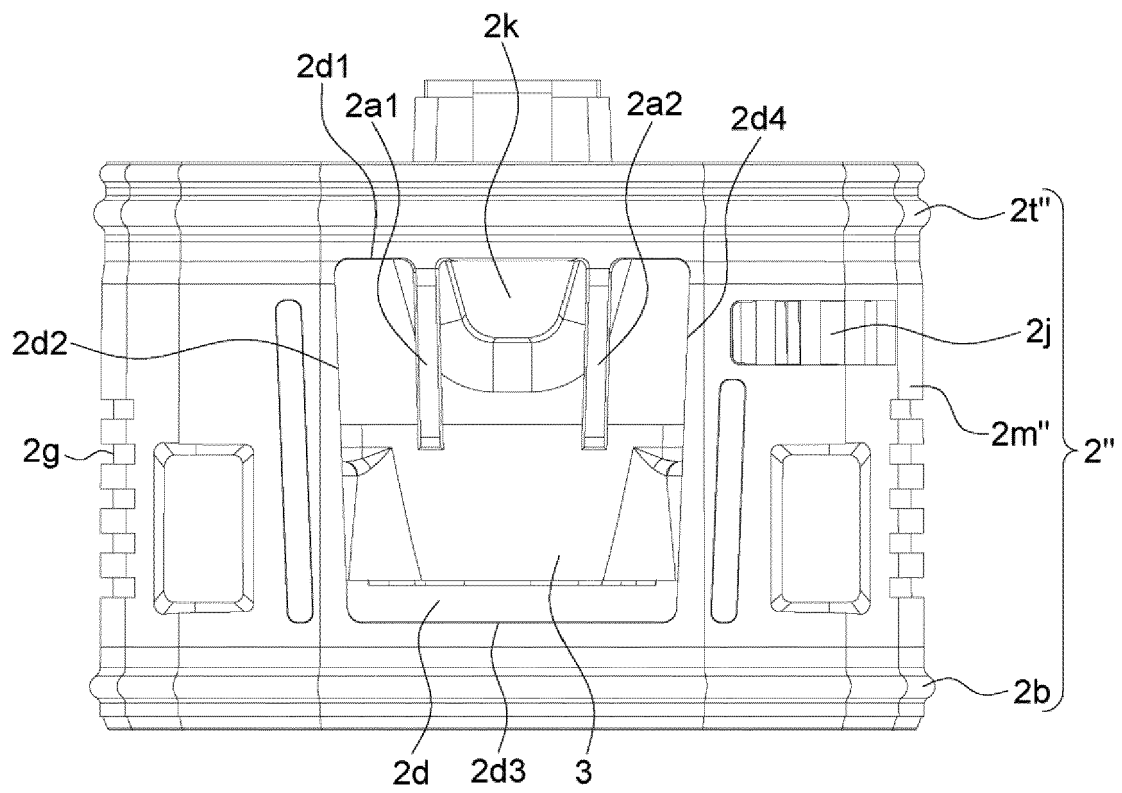


FIG. 11

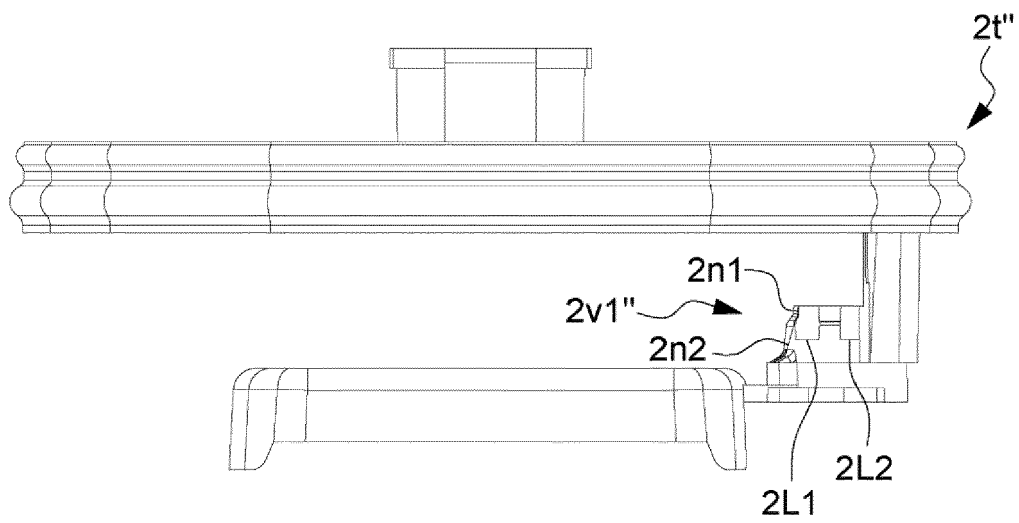


FIG. 12A

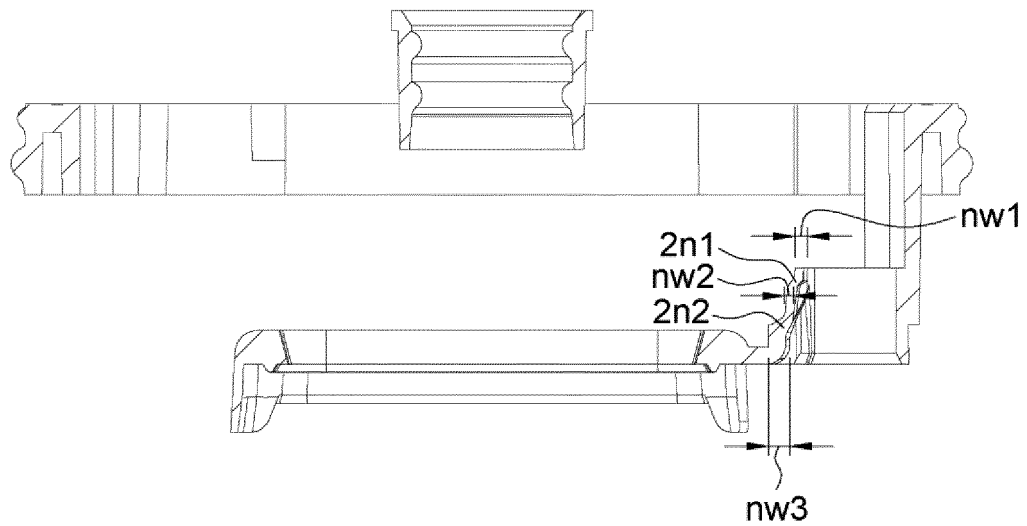


FIG. 12B

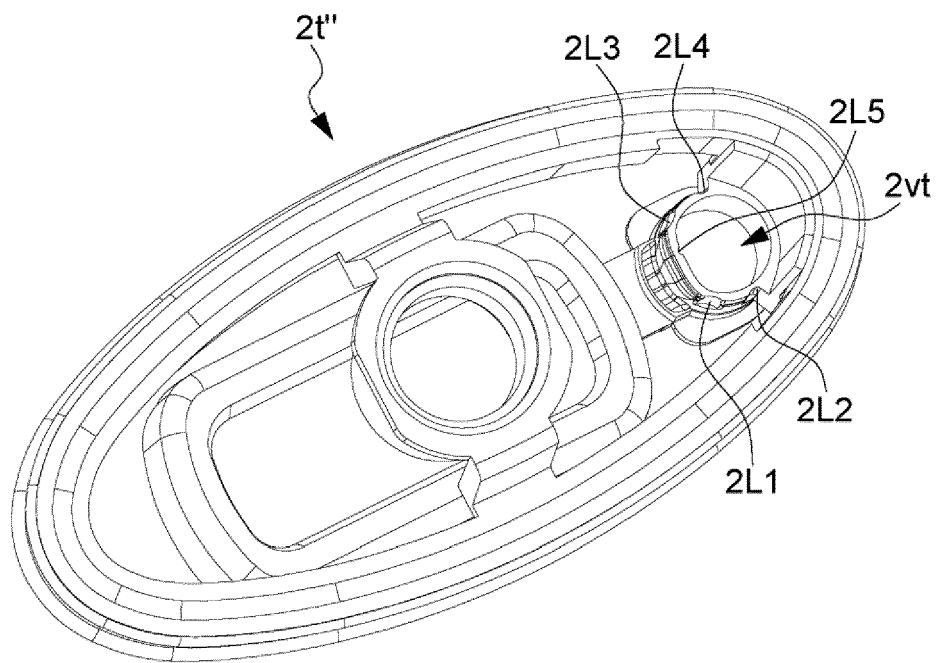


FIG. 12C

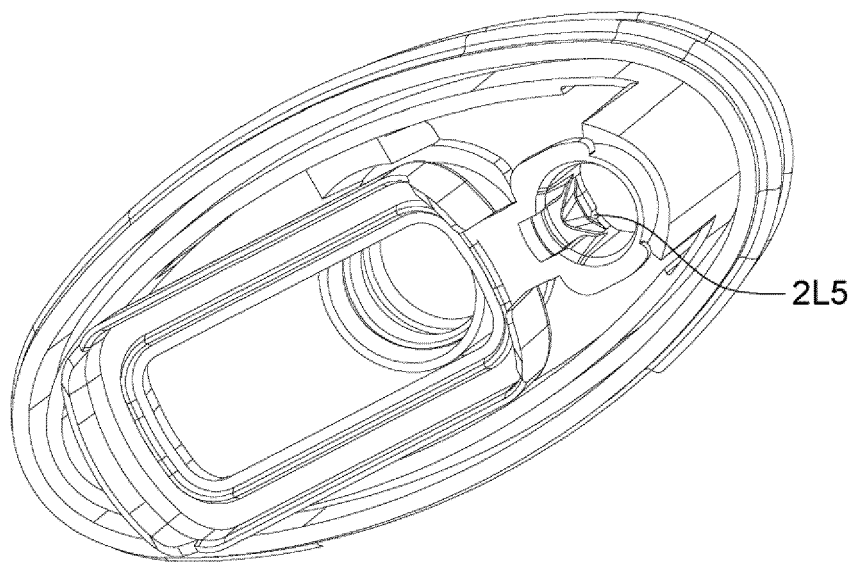


FIG. 12D

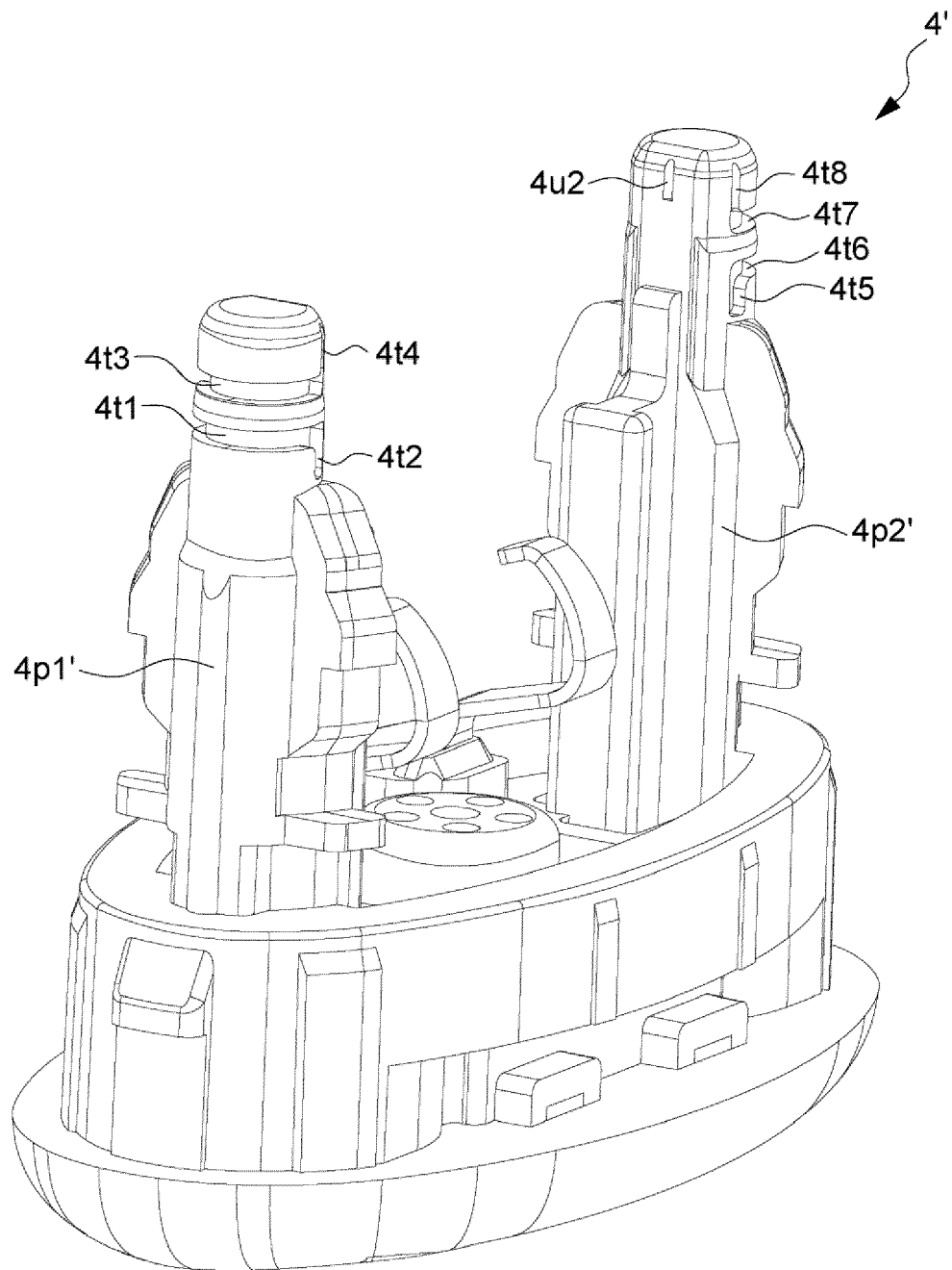


FIG. 13A

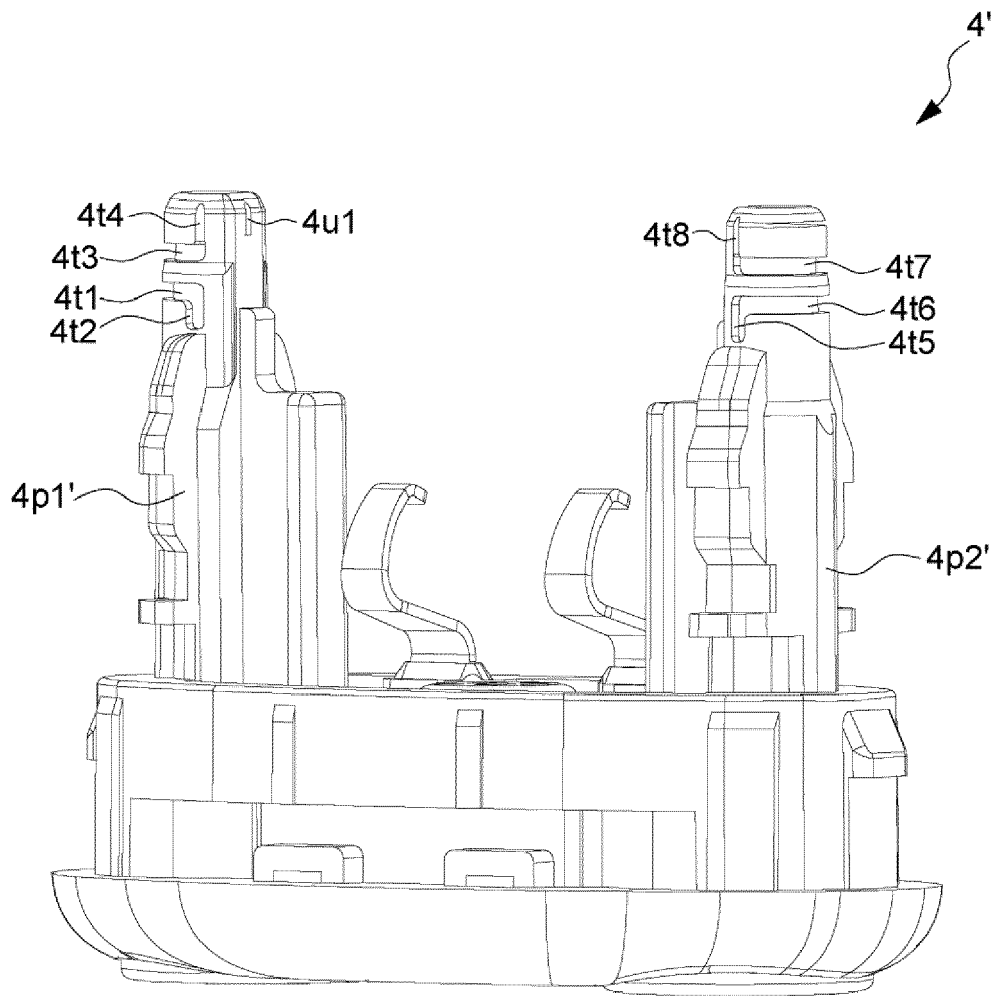


FIG. 13B

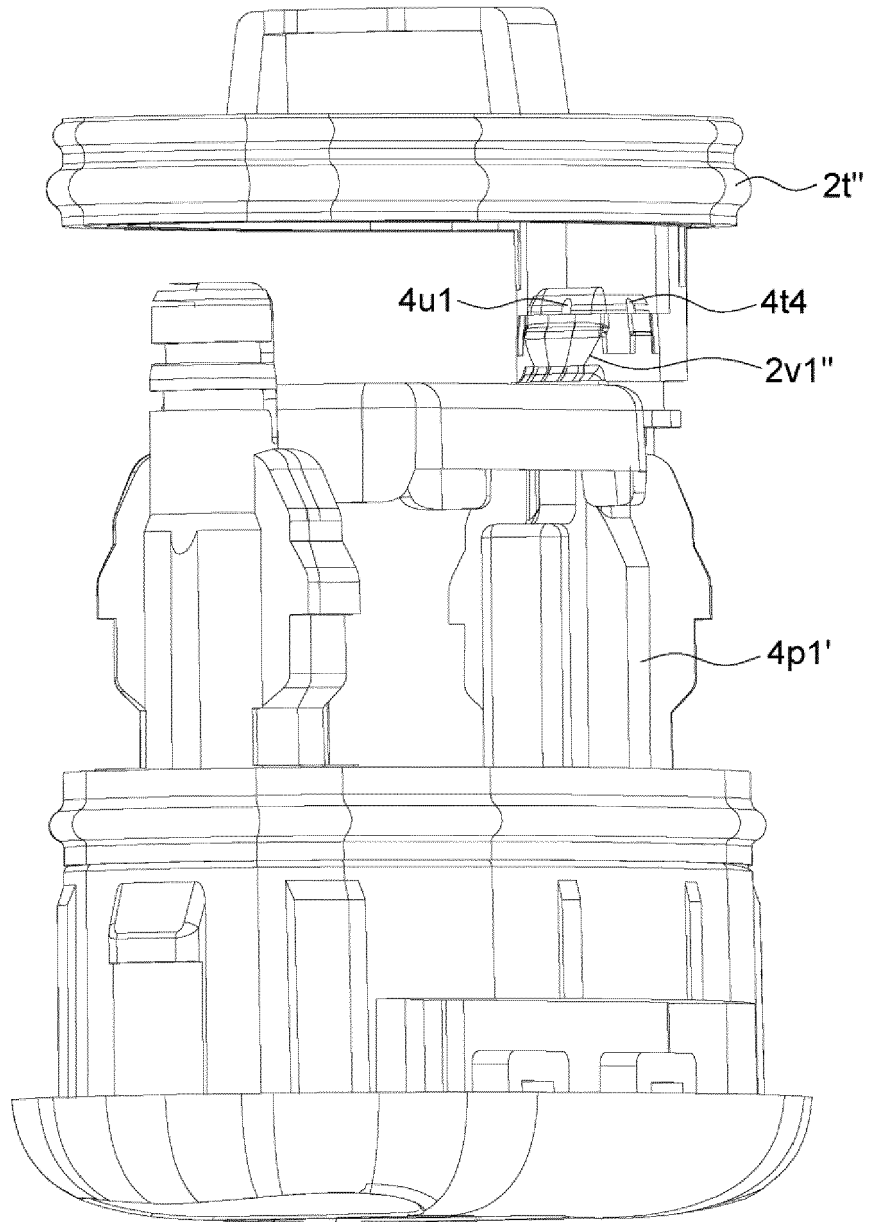


FIG. 14A

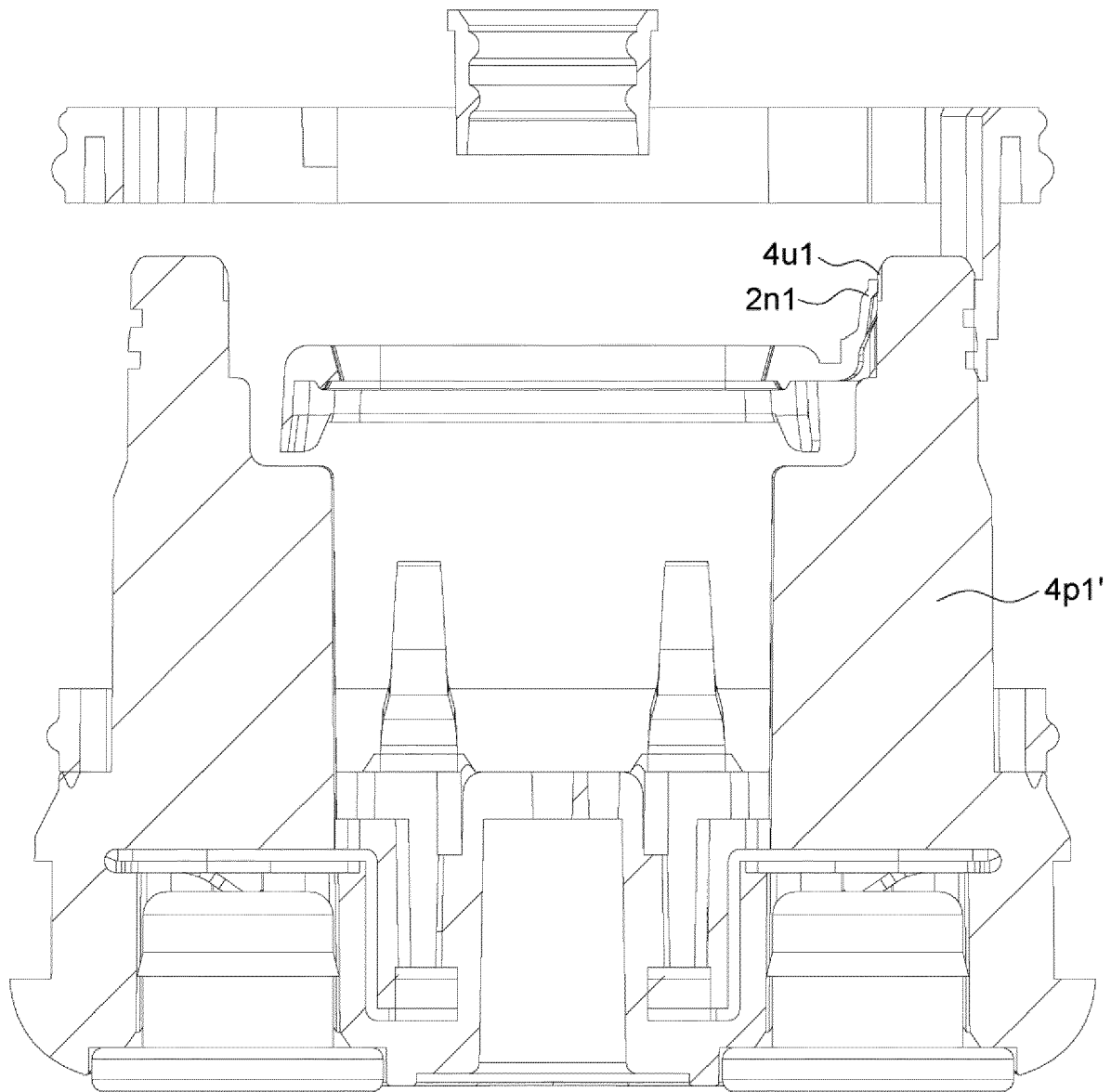


FIG. 14B



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