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(71) Applicant: **Shenzhen Eigate Technology Co., Ltd.**
Shenzhen, Guangdong 518103 (CN)

(72) Inventor: **Liu, Tuanfang**
Shenzhen, Guangdong, 518000 (CN)

(74) Representative: **Niburska, Danuta**
Kancelaria Patentowa
Al. 3 Maja 68 B
76-200 Slupsk (PL)

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(54) **ATOMIZER AND ELECTRONIC CIGARETTE COMPRISING THE SAME**

(57) An atomizer includes an e-liquid tank (1), an atomizing core, and an isolation member (2). The e-liquid tank includes an e-liquid chamber (105) and the atomizing core includes an at least one e-liquid inlet (301). The at least one e-liquid inlet communicates with the e-liquid chamber. The isolation member is disposed around and movable with respect to the atomizing core, and is configured to close the at least one e-liquid inlet. The isolation member comprises a pull rod (206) configured to drag the isolation member to slide away from the at least one e-liquid inlet.

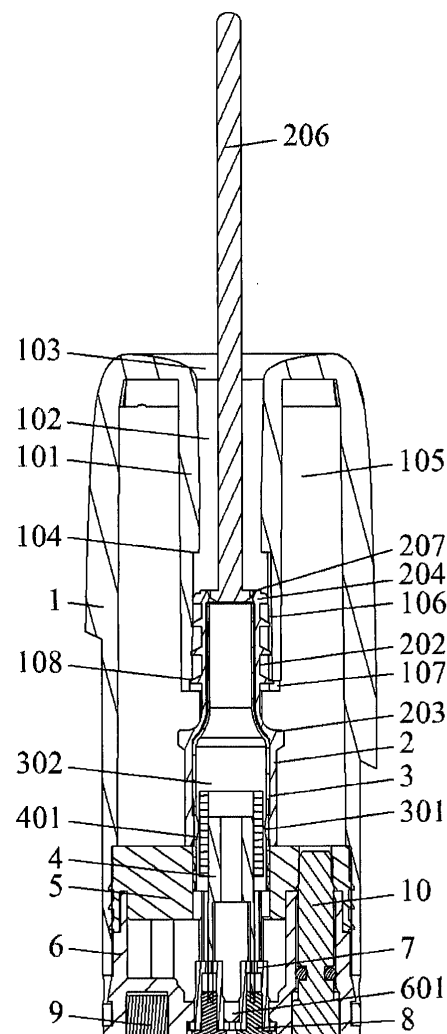


FIG. 7

Description

[0001] The disclosure relates to an atomizer and an electronic cigarette comprising the same.

[0002] Conventional atomizers include e-liquid tanks and atomizing cores. The atomizing cores are provided with e-liquid inlets through which the e-liquid in the e-liquid tank can flow into the atomizing cores and is atomized by heating elements to produce aerosol.

[0003] The e-liquid may flow through the e-liquid inlets out of the atomizers, thus staining the atomizers. Outside air can also enter the e-liquid inlets into the e-liquid tanks to oxidize the e-liquid before atomization, affecting the taste of the e-liquid. The e-liquid may flow through the e-liquid inlets into the atomizing cores to contact with the heating element before atomization, which leads to a shortened service life of the heating element.

[0004] An atomizer comprises an e-liquid tank, an atomizing core, and an isolation member; the e-liquid tank comprises an e-liquid chamber and the atomizing core comprises an at least one e-liquid inlet; the at least one e-liquid inlet communicates with the e-liquid chamber; the isolation member is disposed around and movable with respect to the atomizing core, and is configured to close the at least one e-liquid inlet; the isolation member comprises a pull rod configured to drag the isolation member to slide away from the at least one e-liquid inlet. The at least one e-liquid inlet is covered by the isolation member to ensure that the atomizer or the atomizing core is sealed before use, thus preventing leakage and oxidation of the e-liquid and extending service life of a heating element; when the pull rod is pulled by a user, the isolation member slides away from the at least one e-liquid inlet to ensure that the at least one e-liquid inlet is opened; the number of the at least one e-liquid inlet is matched to demand; preferably, two or three e-liquid inlets are disposed on the atomizing core to allow adequate flow of e-liquid into the e-liquid tank and minimize the amount of oversupply.

[0005] In a class of this embodiment, the isolation member is formed integrally with or connected to the pull rod; a junction between the isolation member and the pull rod comprises a gouge that facilitates pulling the pull rod out from the isolation member; when the pull rod is pulled by an applied force, the isolation member moves to a designated position to ensure that the at least one e-liquid inlet is opened; and subsequently the force increases, causing the pull rod to be pulled outside the isolation member; the isolation member is left in the atomizer to seal the e-liquid chamber.

[0006] In a class of this embodiment, the atomizer comprises an air channel; a first end of the pull rod is disposed outside the air channel, which facilitates pulling the pull rod by a user; a second end of the pull rod is disposed in the atomizer to seal the air channel, thus preventing the e-liquid from contact with outside air.

[0007] In a class of this embodiment, the first end of the pull rod comprises a cap portion formed integrally

with or connected to the isolation member; a junction between the isolation member and the cap portion comprises a gouge that facilitates pulling the pull rod out from the isolation member; the cap portion is flat or cap-shaped; when the pull rod is pulled by a user, the isolation member slides away from the at least one e-liquid inlet; and subsequently the cap portion is pulled outside the atomizer to open the air channel.

[0008] In a class of this embodiment, the atomizing core comprises an atomizing tube; the isolation member is hollow and disposed around the atomizing tube; the cap portion is formed integrally with or connected to a first end of the isolation member to seal the isolation member; and the gouge is disposed between the cap portion and the first end of the isolation member; the pull rod comprises a rod and the cap portion is disposed on one end of the rod; the other end of the rod is disposed outside the atomizer; the cap portion is disposed into the first end of the isolation member to seal the isolation member, the atomizing tube, and the air channel; the pull rod is pulled outside the atomizer to open the air channel, which allows the airflow and smoke to pass through.

[0009] In a class of this embodiment, the isolation member is in the shape of a sheet; the isolation member is disposed around the atomizing tube to seal the at least one e-liquid inlet; the number of the at least one e-liquid inlet is matched to demand; the number of the isolation member is equal to or more than that of the at least one e-liquid inlet; the isolation member is completely disposed on the pull rod.

[0010] In a class of this embodiment, the atomizing tube comprises a guide part configured to guide the isolation member to slide along a preset path; the guide part is suitable for used in isolation members in the shape of a hollow cylinder or a sheet; when the isolation member is in the shape of a sheet, the isolation member slides along a path established by the guide part so that the at least one e-liquid inlet can be closed by the isolation member, thus achieving a sealing effect. The guide part is in the form of a slot, a column, or a hole; for example, the atomizing tube comprises a side wall and a slot disposed axially on the side wall; the at least one e-liquid inlet is disposed in the slot; the isolation member is disposed in the slot and are movable in the slot; for example, the atomizing tube comprises a column and the isolation member comprises a strip hole; the isolation member is disposed on the column through the strip hole.

[0011] In a class of this embodiment, the isolation member comprises a limiting portion configured to guide the isolation member to slide only within a certain limited range in the atomizer; the at least one e-liquid inlet is opened or closed by sliding the isolation member; the limiting portion is in the form of a chute, a convex part, or a flange the limiting portion is also configured to seal the e-liquid chamber.

[0012] In a class of this embodiment, the isolation member comprises an outer wall and a lubricating portion protruding radially from the outer wall; the lubricating por-

tion is configured to reduce friction between the isolation member and an inner wall of the air channel; when the friction is too large, the pull rod may be pulled outside the atomizer before the isolation member slides; the lubricating portion is in the form of a gap, a sheet-shaped bosses disposed at intervals, or a lubricating layer; the lubricating layer comprises lubricating oil, lubricating powder, or other lubricating materials.

[0013] In a class of this embodiment, the e-liquid tank further comprises an open top functioning as a mouthpiece; the e-liquid tank further comprises an air conduction tube extending upward to communicate with the mouthpiece; the isolation member is in the form of a hollow cylinder and comprises a first sleeve and a second sleeve; the first sleeve has a reduced diameter than the second sleeve; the second sleeve comprises a proximal end near the first sleeve and a flange disposed on the proximal end; the flange is configured to abut against the air conduction tube; the atomizing tube comprises a first tube and a second tube; the first tube has a reduced diameter than the second tube; the isolation member is disposed around the atomizing tube and is matched to the atomizing tube in shape and size; the first sleeve is disposed around the first tube and the second sleeve is disposed around the second tube; the at least one e-liquid inlet is disposed on the second tube; the second sleeve and the second tube are disposed in the e-liquid chamber; the first tube and the first sleeve are disposed into the air conduction tube; the air conduction tube comprises a bottom end away from the mouthpiece; the isolation member is slidable between the flange and the bottom end; when the isolation member is pulled away from the at least one e-liquid inlet, the flange abuts against the bottom end of the air conduction tube to prevent the isolation member from sliding; the isolation member is left in the atomizer to seal the e-liquid chamber.

[0014] In a class of this embodiment, the isolation member comprises a first boss protruding radially from the outer wall and functioning as the limiting portion; the isolation member is in the form of a straight column; the first boss is in the shape of a sheet and is disposed around the isolation member; the number of the first boss is matched to demand; or at least two first bosses are disposed successively around the isolation member.

[0015] In a class of this embodiment, the isolation member is in the form of a hollow cylinder and comprises the first sleeve and the second sleeve; the first sleeve has a reduced diameter than the second sleeve; the second sleeve comprises the proximal end near the first sleeve and the flange disposed on the proximal end; the flange is configured to abut against the air conduction tube; the second sleeve further comprises the first boss protruding radially from the flange; the flange and the first boss constitute the limiting portion.

[0016] In a class of this embodiment, the air conduction tube is configured to receive one end of the atomizing tube and one end of the isolation member; the lubricating

portion is disposed between the isolation member and an inner wall of the air conduction tube; the lubricating portion is in the form of a gap, a lubricating layer, or a plurality of second bosses protruding from the outer wall of the isolation member; each of the plurality of second bosses comprises an edge abutting against the inner wall of the air conduction tube; when the isolation member comprises the first sleeve and the second sleeve, the lubricating portion is disposed between an outer wall of the first sleeve and the inner wall of the air conduction tube; the lubricating portion is in the form of a gap, a lubricating layer, or a plurality of second bosses protruding from the outer wall of the first sleeve; the number of the plurality of second bosses is matched to demand; the plurality of second bosses is in the shape of a sheet and is disposed axially on the outer wall of the first sleeve; each of the plurality of second bosses is in the shape of a sheet and is disposed axially on the outer wall of the first sleeve; or each of the plurality of second bosses is disposed helically on the outer wall of the first sleeve; or the plurality of second bosses is disposed across the outer wall of the first sleeve; the plurality of second bosses abuts against the inner wall of the air conduction tube to reduce contact area and friction between the first sleeve and the air conduction tube; when the friction is too large, the pull rod is pulled outside the atomizer before the isolation member slides.

[0017] In a class of this embodiment, the air conduction tube further comprises a groove disposed on the inner wall and configured to equalize the pressure in the e-liquid chamber with the outside pressure; the air conduction tube further comprises a through hole and/or a notch communicating with the e-liquid chamber; the air conduction tube further comprises a seal member configured to seal the groove; the seal member is disposed on the isolation member and/or the pull rod; the groove is opened when the seal member and/or the pull rod is pulled away from the groove; the through hole/the notch is disposed in any portion of the groove when the seal member is disposed on the pull rod to seal an upper portion of the groove; the through hole/the notch is disposed on a lower portion of the groove when the seal member is disposed on the isolation member to seal the lower portion of the groove; the seal member is disposed on the groove to prevent leakage of the e-liquid and smoke; when the pull rod is pulled by a user, the isolation member slides, causing the seal member to slide away from the groove; the pull rod is pulled out of the e-liquid tank to open the air channel; the groove communicates with the air channel to provide sufficient pressure for smooth flow of the e-liquid into the e-liquid tank, thus preventing a heating element from burning out; the groove has a depth of 0.10-0.20 mm and a width of ≤ 2 mm; preferably, the groove has a depth of 0.15 mm and a width of 0.5 mm, which allows only air to pass through while preventing the passage of the e-liquid.

[0018] In a class of this embodiment, the seal member is a third boss that protrudes radially from the outer wall

of the isolation member and/or the pull rod and is configured to seal at least one end of the groove; the third boss is in the shape of a sheet and is disposed around the outer wall of the isolation and/or the pull rod; the third boss is disposed on the isolation member to seal one end of the groove and is disposed on the pull rod to seal the other end of the groove.

[0019] In a class of this embodiment, one end of the inner wall of the air conduction tube is concave to form a first concave part and a first convex part; the first concave part extends from the first convex part to the bottom end of the air conduction tube; the groove is disposed on the first concave part and extends to the bottom end of the air conduction tube; the third boss is disposed on the pull rod and abuts against the first convex part; the third boss is configured to seal the one end of the groove; the plurality of second bosses is disposed between the third boss and the flange and abuts against the first concave part.

[0020] In a class of this embodiment, one end of the inner wall of the air conduction tube is concave to form a first concave part and a first convex part; the first concave part extends from the first convex part to the bottom end of the air conduction tube; the groove is disposed on the inner wall of the air conduction tube above the first concave part; one end of the groove extends to the first convex part; the third boss is disposed on the outer wall of the isolation member and abuts against the first convex part; the third boss is configured to seal the other end of the groove; the third boss is disposed between the flange and the plurality of second bosses; the third boss is disposed only on the isolation member; the plurality of second bosses is disposed on the inner wall of the air conduction tube that is located above the first concave part.

[0021] In a class of this embodiment, one end of the inner wall of the air conduction tube is concave to form a first concave part and a first convex part; the first concave part extends from the first convex part to the bottom end of the air conduction tube; the first concave part comprises a distal end away from the mouthpiece and the distal end is concave to form a second concave part and a second convex part; the groove is disposed on the first concave part and extends from the first convex part to the second convex part; the pull rod and the isolation element separately comprise the third boss protruding radially from the outer wall and abutting against the first convex part and the second convex part, respectively; the plurality of second bosses abuts against the first concave part.

[0022] In a class of this embodiment, the e-liquid tank further comprises a bottom open and a seal cover; the seal cover is disposed on the bottom open to seal the e-liquid chamber; the atomizing tube comprise a bottom end away from the mouthpiece and the bottom end is disposed into the seal cover; the atomizer comprises a heating element abutting against an edge of the at least one e-liquid inlet.

[0023] In a class of this embodiment, the isolation

member and the pull rod separately comprise silica gel, latex, rubber, or plastic; the first boss, the plurality of second bosses, and the third boss each comprise silica gel, latex, rubber, or plastic.

[0024] In a class of this embodiment, at least one of the first boss, the plurality of second bosses, and the third boss closest to the mouthpiece is inclined downward and presents in a shape of a canopy; specifically, when the first boss is disposed above the plurality of second bosses and the third boss, the first boss is inclined downward to form a shape of a canopy; when the plurality of second bosses is disposed above the first boss and the third boss, the plurality of second bosses is inclined downward to form a shape of a canopy; when the third boss is disposed above the first boss and the plurality of second bosses, the third boss is inclined downward to form a shape of a canopy; the canopy is an inclined plane or an inclined arc surface; when the atomizer is overheated to expand and overcooled to contract, a pressure difference is generated due to temperature differences between inside and outside of the atomizer; the canopy structure prevents deforming of the atomizer, thus enhancing the leak resistance of the atomizer.

[0025] The disclosure further comprises an electronic cigarette; the electronic cigarette comprises the atomizer and a battery assembly.

[0026] The following advantages are associated with the atomizer and the electronic cigarette of the disclosure: the at least one e-liquid inlet is sealed by the isolation assembly to isolate the e-liquid and inside air, thus avoiding leakage and oxidization of the e-liquid; the isolation assembly also prevents the e-liquid from being in contact with the heating element, avoiding burning out before use, extending service life of the heating element; the pull rod is slidable in the air conduction tube to ensure that the at least one e-liquid inlet can be opened and closed, thus enhancing user experience.

FIG. 1 is an exploded view of an atomizer according to Example 1 of the disclosure;

FIG. 2 is a perspective view of an atomizer according to Example 1 of the disclosure;

FIG. 3 is a cross-sectional view of an atomizer prior to use according to Example 1 of the disclosure;

FIG. 4 is another cross-sectional view of an atomizer after use according to Example 1 of the disclosure;

FIG. 5 is a cross-sectional view including arrows showing a pressure balance in an atomizer according to Example 1 of the disclosure;

FIG. 6 is a cross-sectional view including arrows showing the direction of airflow in an atomizer according to Example 1 of the disclosure; and

FIG. 7 is a cross-sectional view of an atomizer prior to use according to Example 2 of the disclosure;

[0027] In the drawings, the following reference numbers are used: 1. E-liquid tank; 2. Isolation member; 3. Atomizing tube; 4. Heating element; 5. Seal cover; 6. Fixing base; 7. Insulating member; 8. Electrode; 9. Magnetic member; 10. Seal member; 105. E-liquid chamber; 106. Groove; 107. Air duct; 201. Hollow channel; 202. First sleeve; 203. Flange; 204. Second boss; 205. Third boss; 206. Pull rod; 207. Gouge; 300. First boss; 301. First e-liquid inlet; 302. Atomizing channel; and 601. Air inlet.

[0028] To further illustrate, embodiments detailing an atomizer and an electronic cigarette comprising the same are described below. It should be noted that the following embodiments are intended to describe and not to limit the disclosure.

Example 1

[0029] Referring to FIGS. 1-4, an atomizer comprises an e-liquid tank 1, an isolation member 2, an atomizing tube 3, a heating element 4, a seal cover 5, a fixing base 6, two insulating members 7, two electrodes 8, a magnetic member 9, and a seal member 10. The heating element 4 is wrapped in a piece of e-liquid absorbent cotton. The atomizing tube 3 constitutes an atomizing channel 302 for air conduction and emission. The atomizing tube 3 comprises a peripheral wall and at least one first e-liquid inlet 301 disposed on the peripheral wall. The heating element 4 is disposed in the atomizing channel 302 to atomize e-liquid. At least one end of the heating element 4 abuts against the edge of the at least one first e-liquid inlet 301 to absorb the e-liquid.

[0030] The isolation member 2 comprises a hollow channel 201. The hollow channel 201 is disposed around the atomizing tube to seal the and the at least one first e-liquid inlet 301. The e-liquid tank comprises an e-liquid chamber 105 and an air conduction tube 101. The air conduction tube 101 and the atomizing tube 3 constitutes an air channel 102 communicating with an atmosphere and allowing for air conduction. The e-liquid tank 1 comprises a top open functioning as a mouthpiece 1 and communicating with the air channel 102. The air conduction tube 101 extends from the mouthpiece 103 downward into the e-liquid tank 1. The air conduction tube 101 comprises an inner wall and one end of the inner wall is concave to form a first concave part and a first convex part 104. The first convex part 104 is disposed on the first concave part. The air conduction tube 101 further comprises an air duct 107 disposed on a bottom portion of the inner wall. The air duct 107 communicates with the e-liquid chamber 105 to ensure that outside air can flow into the e-liquid chamber to equalize the pressure in the e-liquid chamber with the outside pressure. The air conduction tube 101 further comprises a groove 106 disposed on the first concave part and communicating with

the air duct 107.

[0031] The isolation member 2 comprises a first sleeve 202 and a second sleeve 200 connected to the first sleeve 202. The first sleeve 202 has a reduced diameter than the second sleeve 200. The first sleeve 202 is disposed under the first convex part 104 and in the air conduction channel 102. The second sleeve 200 is disposed in the e-liquid chamber 105 and is disposed around the atomizing tube 3 to seal the at least one first e-liquid inlet 301. The second sleeve 200 comprises a proximal end near the first sleeve 202 and a flange 203 disposed on the proximal end. The flange 203 is configured to abut against the air conduction tube 101. The second sleeve further comprises a first boss 300 protruding radially from the flange 203.

[0032] The first sleeve 202 comprises an outer wall and a plurality of second bosses 204 protruding radially from the outer wall. The plurality of second bosses 204 abuts against the inner wall of the air conduction tube 101 to reduce contact area and friction between the first sleeve 202 and the air conduction tube 101. When the friction is too large, a pull rod 206 is pulled outside the atomizer before the isolation member 2 slides.

[0033] Gaps are defined by the plurality of second bosses 204 and the outer wall of the groove 106. When the pull rod 9 is pulled out of the open top of the first sleeve 202, the outside air flows through the gaps and enters the air duct 107 into the e-liquid chamber 105 to equalize the pressure in the e-liquid chamber 105 with the outside pressure.

[0034] The pull rod 206 comprises a rod and a cap portion disposed on one end of the rod. The cap portion is disposed into an open top of the first sleeve 202. A junction between the cap portion and the first sleeve comprises a gouge 207, which facilitates pulling the cap portion out from the first sleeve 202. The other end of the pull rod 206 extends from the air channel 102 through the mouthpiece 103 out of the e-liquid tank 1 to ensure that the pull rod 206 can be pulled outside the atomizer. The pull rod 206 is pulled outside the atomizer to open the air channel 102. The pull rod 206 further comprises a third boss 205 abutting against the first convex part 104 and configured to seal the air channel 102. The third boss 205 is inclined downward to form a shape of a canopy, which avoids pressure difference due to temperature differences between inside and outside of the atomizer, thus preventing deforming of the third boss 205 and enhancing the leak resistance of the atomizer.

[0035] The rod is pulled upward, causing the isolation member 2 to slide upward as well. The first sleeve 202 is moved to the bottom end of the air conduction tube 101 to communicate with the air channel 102. The cap portion is pulled out of the open top of the first sleeve 202 and subsequently pulled outside the mouthpiece 103 to ensure that the air channel 102 is opened and the at least one first e-liquid inlet 301 communicates with the e-liquid chamber 105. The e-liquid flows through the at least one first e-liquid inlet 301 into the heating element 4 and is

atomized to produce smoke and e-cigarette vapor. The outside air flows through the mouthpiece 103, the air channel 102, the groove 106, and the air duct 107, and enters the e-liquid chamber 105.

[0036] The seal cover 5 is disposed in the e-liquid chamber 105 to seal the e-liquid. One end of the atomizing tube 3 is disposed into the seal cover 5. The fixing base 6 is disposed in a bottom portion of the e-liquid tank 1. The two insulating members 7 are disposed in a bottom portion of the fixing base 6 to isolate the conductive wires of the heating element 4. The bottom portion of the fixing base 6 comprises an air inlet 601. The two electrodes 8 are disposed in the two insulating members 7, respectively, and are electrically connect to the heating element 4. The magnetic member 9 is disposed in the bottom portion of the fixing base 6. The fixing base 6 further comprises a second e-liquid inlet. The seal member 10 is disposed in the second e-liquid inlet to seal the e-liquid tank after the e-liquid tank 1 is completely filled.

[0037] FIG. 5 is a cross-sectional view including arrows showing the route of the outside air entering the e-liquid tank 1. The cap portion is pulled out of the open top of the first sleeve 202 and subsequently pulled outside the mouthpiece 103 to ensure that the air channel 102 is opened and the at least one first e-liquid inlet 301 communicates with the e-liquid chamber 105. The e-liquid flows through the at least one first e-liquid inlet 301 into the heating element 4 and is atomized to produce smoke and e-cigarette vapor. The outside air flows through the mouthpiece 103, the air channel 102, the gaps, and the air duct 107, and enters the e-liquid chamber 105 to provide sufficient pressure for smooth flow of the e-liquid into the e-liquid tank 1.

[0038] FIG. 6 is a cross-sectional view including arrows showing the route of the airflow in the atomizer. The outside air flows through the air inlet 601 into the atomizing channel 302, causing the heating element 4 to atomize the e-liquid. The smoke or e-cigarette vapor produced flows through the air channel 102 into the mouthpiece 103 and is inhaled by a user.

Example 2

[0039] A second example of the isolation member is illustrated in FIG. 7. It is similar to the example described above in connection with FIGS. 1-6, except for the specific differences described below. One end of the inner wall of the air conduction tube 101 is concave to form a first concave part and a first convex part 104. The first concave part extends from the first convex part 104 to the bottom end of the air conduction tube 101. The first concave part comprises a distal end away from the mouthpiece 103 and the distal end is concave to form a second concave part and a second convex part 108. The groove 106 is disposed on the first concave part and extends from the first convex part 104 to the second convex part 108. The third boss 205 is disposed only on the outer wall of the isolation member. The third boss 205 is con-

figured to abut against the second convex part 108 and function as the plurality of the second bosses 204.

Example 3

[0040] A third example of the isolation member is described above in connection with FIGS. 1-7, except for the differences described below. The isolation member 2 is in the shape of an annular disc and has the same number of the at least one first e-liquid inlet 301. When the atomizing tube 3 comprises a plurality of first e-liquid inlets 301, a plurality of isolation members 2 are separately connected to the cap portion of the pull rod 206. The third boss 205 is disposed on the pull rod 206 and abuts against the first convex part 104 to seal the air channel 102 and the groove 106. The atomizing tube 3 comprises a plurality of slots disposed on the peripheral wall. The plurality of isolation members 2 are disposed in the plurality of slots, respectively, and are slidable in the corresponding slot. Each of the plurality of slots comprises a slot face and at least one first e-liquid inlet 301 is disposed on the corresponding slot face.

Claims

1. An atomizer, comprising:

an e-liquid tank;
an atomizing core; and
an isolation member;

wherein:

the e-liquid tank comprises an e-liquid chamber and the atomizing core comprises an at least one e-liquid inlet;
the at least one e-liquid inlet communicates with the e-liquid chamber;
the isolation member is disposed around and movable with respect to the atomizing core, and is configured to close the at least one e-liquid inlet;
the isolation member comprises a pull rod configured to drag the isolation member to slide away from the at least one e-liquid inlet.

2. The atomizer of claim 1, wherein the atomizer comprises an air channel; a first end of the pull rod is disposed outside the air channel, and a second end of the pull rod is disposed in the atomizer to seal the air channel.

3. The atomizer of claim 2, wherein the first end of the pull rod comprises a cap portion formed integrally with or connected to the isolation member; a junction between the isolation member and the cap portion comprises a gouge that facilitates pulling the pull rod

out from the isolation member.

4. The atomizer of claim 3, wherein

the atomizing core comprises an atomizing tube; 5
the isolation member is hollow and disposed around the atomizing tube; the cap portion is formed integrally with or connected to a first end of the isolation member to seal the isolation member; and the gouge is disposed between the cap portion and the first end of the isolation member; or
the isolation member is in the shape of a sheet; the isolation member is disposed around the atomizing tube to seal the at least one e-liquid inlet. 15

5. The atomizer of claim 4, wherein the atomizing tube comprises a guide part configured to guide the isolation member to slide along a preset path. 20

6. The atomizer of claim 4, wherein the isolation member comprises a limiting portion configured to guide the isolation member to slide only within a certain limited range in the atomizer. 25

7. The atomizer of claim 6, wherein the isolation member comprises an outer wall and a lubricating portion protruding radially from the outer wall. 30

8. The atomizer of claim 7, wherein 35

the e-liquid tank further comprises an open top functioning as a mouthpiece; the e-liquid tank further comprises an air conduction tube extending upward to communicate with the mouthpiece; the isolation member is in the form of a hollow cylinder and comprises a first sleeve and a second sleeve; the first sleeve has a reduced diameter than the second sleeve; the second sleeve comprises a proximal end near the first sleeve and a flange disposed on the proximal end; the flange is configured to abut against the air conduction tube; the atomizing tube comprises a first tube and a second tube; the first tube has a reduced diameter than the second tube; 40
the isolation member is disposed around the atomizing tube and is matched to the atomizing tube in shape and size; the first sleeve is disposed around the first tube and the second sleeve is disposed around the second tube; the at least one e-liquid inlet is disposed on the second tube; the second sleeve and the second tube are disposed in the e-liquid chamber; the first tube and the first sleeve are disposed into the air conduction tube; the air conduction tube comprises a bottom end away from the mouthpiece; the isolation member is slidable between the flange and the bottom end; 45
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the isolation member comprises a first boss protruding radially from the outer wall; and the flange functions as the limiting portion, or the first boss functions as the limiting portion, or the first boss protrudes radially from the flange, and the flange and the first boss constitute the limiting portion.

9. The atomizer of claim 8, wherein

the air conduction tube is configured to receive one end of the atomizing tube and one end of the isolation member; the lubricating portion is disposed between the isolation member and an inner wall of the air conduction tube; and the lubricating portion is in the form of a gap, a lubricating layer, or a plurality of second bosses protruding from the outer wall of the isolation member; each of the plurality of second bosses comprises an edge abutting against the inner wall of the air conduction tube.

10. The atomizer of claim 8, wherein the air conduction tube further comprises a groove disposed on the inner wall and configured to equalize a pressure in the e-liquid chamber with outside pressure; the air conduction tube further comprises a through hole and/or a notch communicating with the e-liquid chamber; the air conduction tube further comprises a seal member configured to seal the groove; the seal member is disposed on the isolation member and/or the pull rod; and the groove is opened when the seal member and/or the pull rod is pulled away from the groove. 35

11. The atomizer of claim 10, wherein the seal member is a third boss that protrudes radially from the outer wall of the isolation member and/or the pull rod and is configured to seal at least one end of the groove. 40

12. The atomizer of claim 11, wherein: 45

one end of the inner wall of the air conduction tube is concave to form a first concave part and a first convex part; the first concave part extends from the first convex part to the bottom end of the air conduction tube; the groove is disposed on the first concave part and extends to the bottom end of the air conduction tube; the third boss is disposed on the pull rod and abuts against the first convex part; the third boss is configured to seal one end of the groove; the plurality of second bosses is disposed between the third boss and the flange and abuts against the first concave part; or one end of the inner wall of the air conduction tube is concave to form a first concave part and a first convex part; the first concave part extends 50
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from the first convex part to the bottom end of the air conduction tube; the groove is disposed on the inner wall of the air conduction tube above the first concave part; one end of the groove extends to the first convex part; the third boss is disposed on the outer wall of the isolation member and abuts against the first convex part; the third boss is configured to seal the other end of the groove; and the third boss is disposed between the flange and the plurality of second bosses; or

one end of the inner wall of the air conduction tube is concave to form a first concave part and a first convex part; the first concave part extends from the first convex part to the bottom end of the air conduction tube; the first concave part comprises a distal end away from the mouthpiece and the distal end is concave to form a second concave part and a second convex part; the groove is disposed on the first concave part and extends from the first convex part to the second convex part; the pull rod and the isolation element separately comprise the third boss protruding radially from the outer wall and abutting against the first convex part and the second convex part, respectively.

13. The atomizer of claim 8, wherein the e-liquid tank further comprises a bottom open and a seal cover; the seal cover is disposed on the bottom open to seal the e-liquid chamber; the atomizing tube comprise a bottom end away from the mouthpiece and the bottom end is disposed into the seal cover; the atomizer comprises a heating element abutting against an edge of the at least one e-liquid inlet.
14. The atomizer of claim 11, wherein the isolation member and the pull rod separately comprise silica gel, latex, rubber, or plastic; and/or at least one of the first boss, the plurality of second bosses, and the third boss closest to the mouthpiece is inclined downward and presents in a shape of a canopy.
15. An electronic cigarette, comprising the atomizer of any one of claims 1-14 and a battery assembly.

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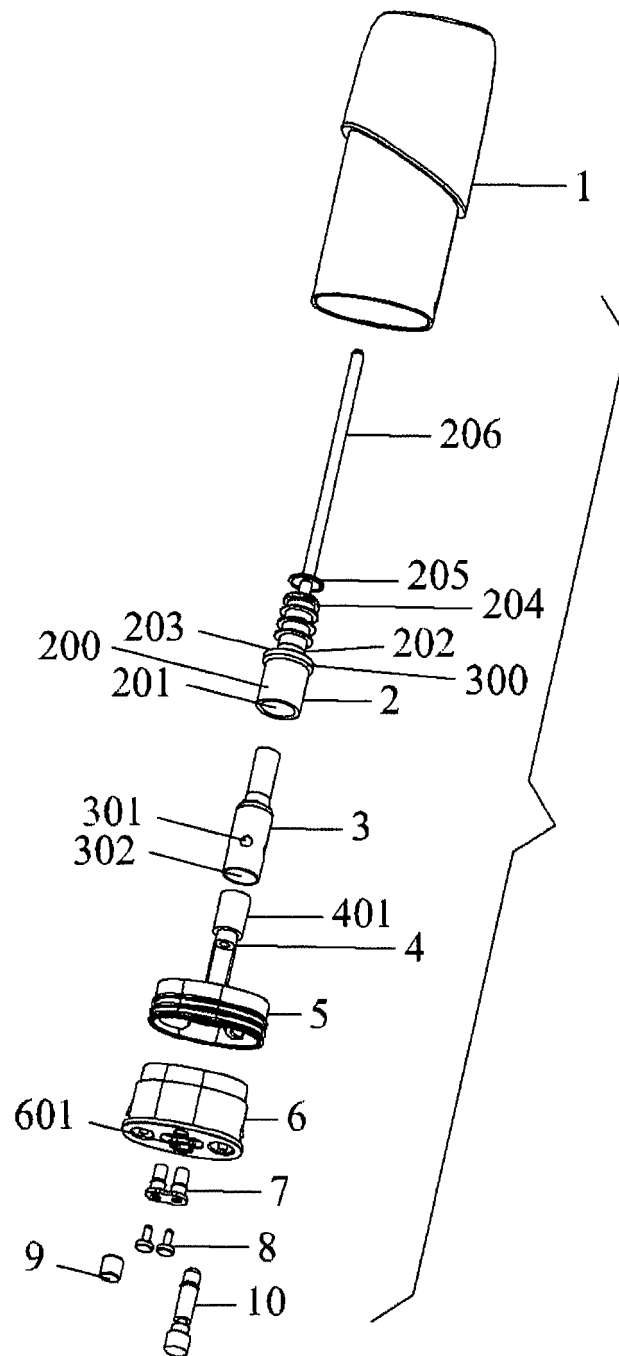


FIG. 1

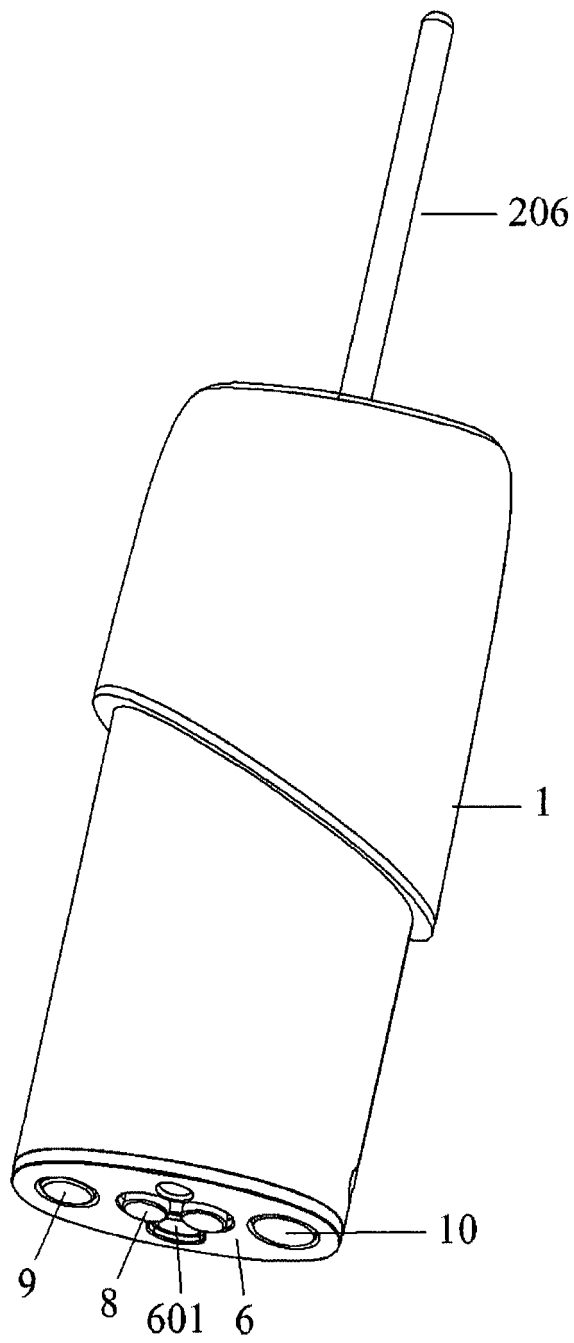


FIG. 2

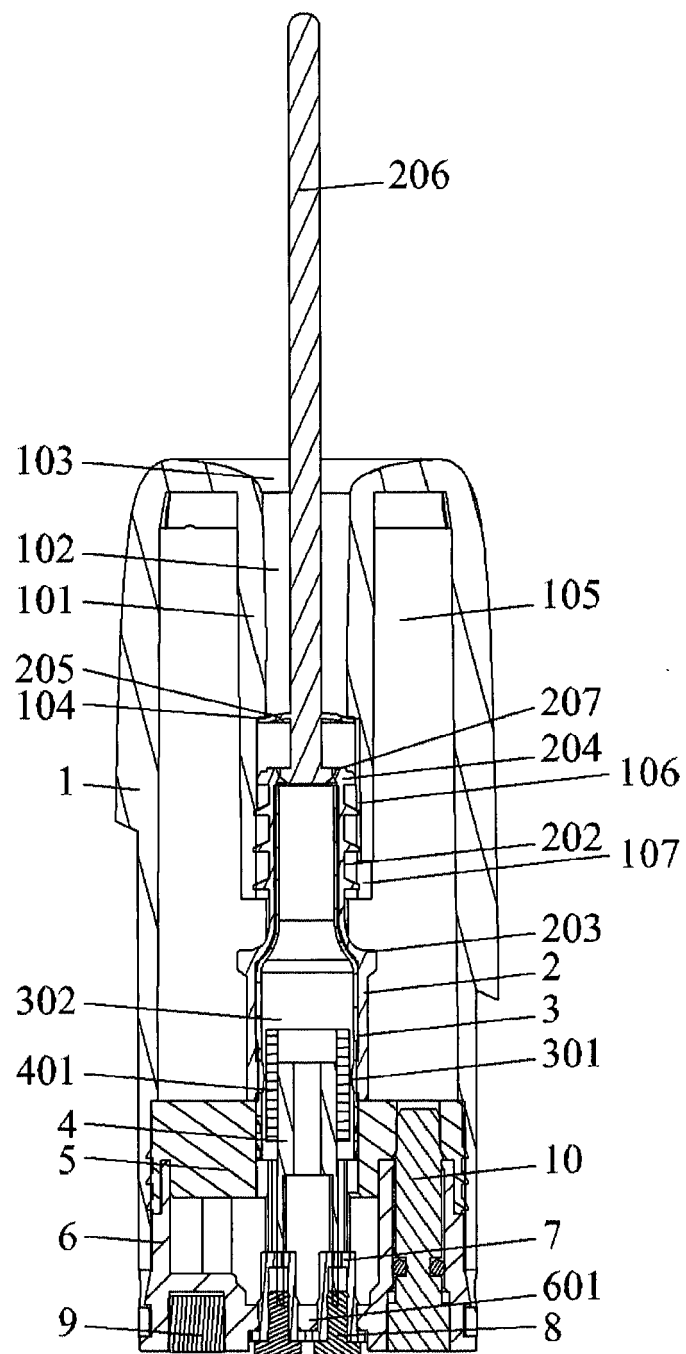


FIG. 3

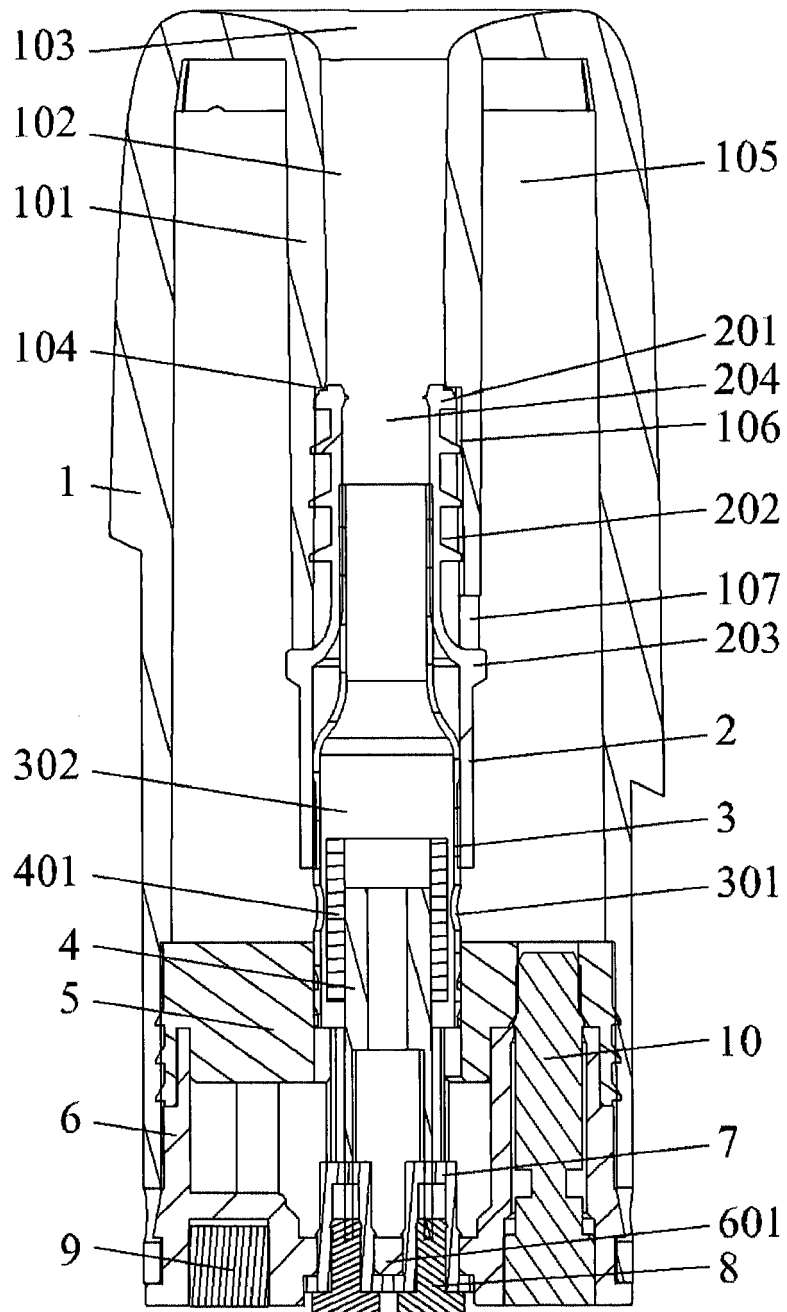


FIG. 4

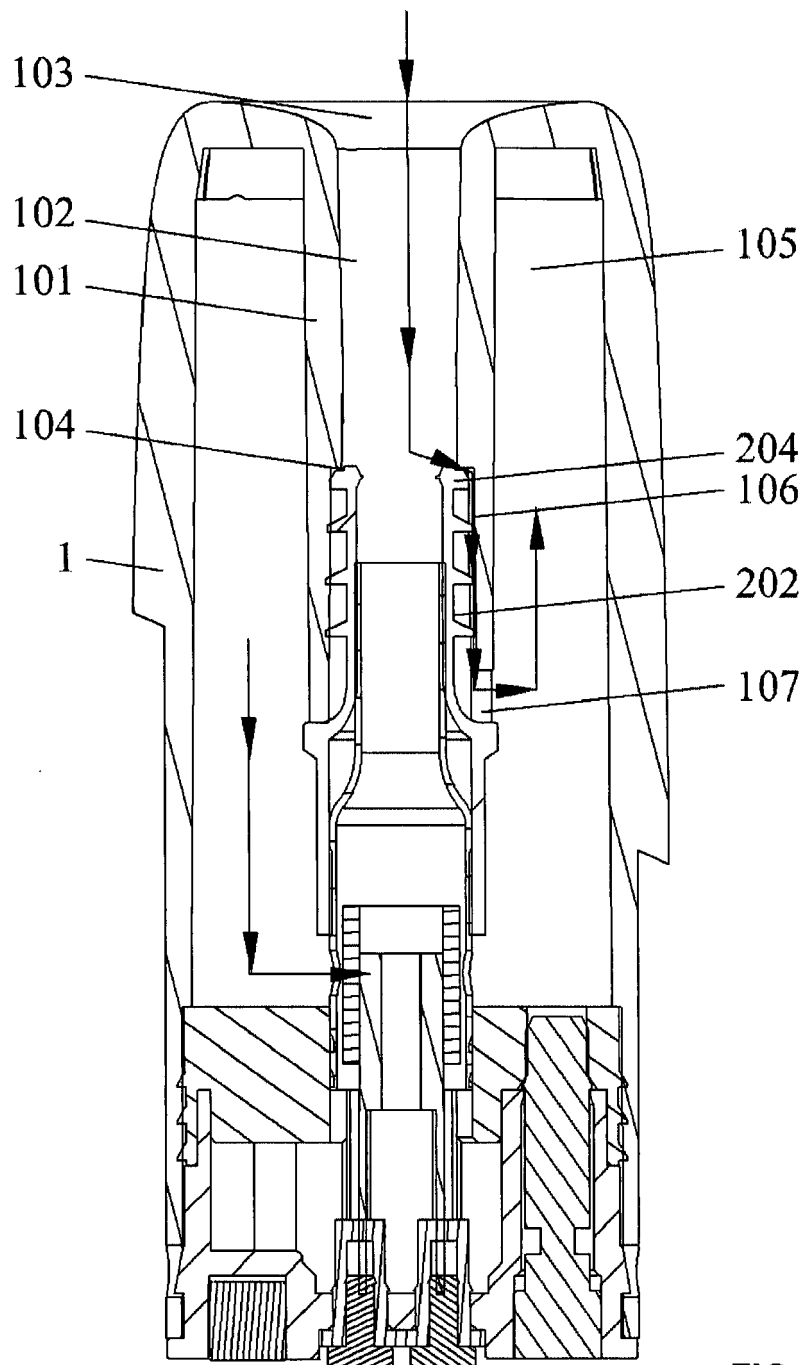


FIG. 5

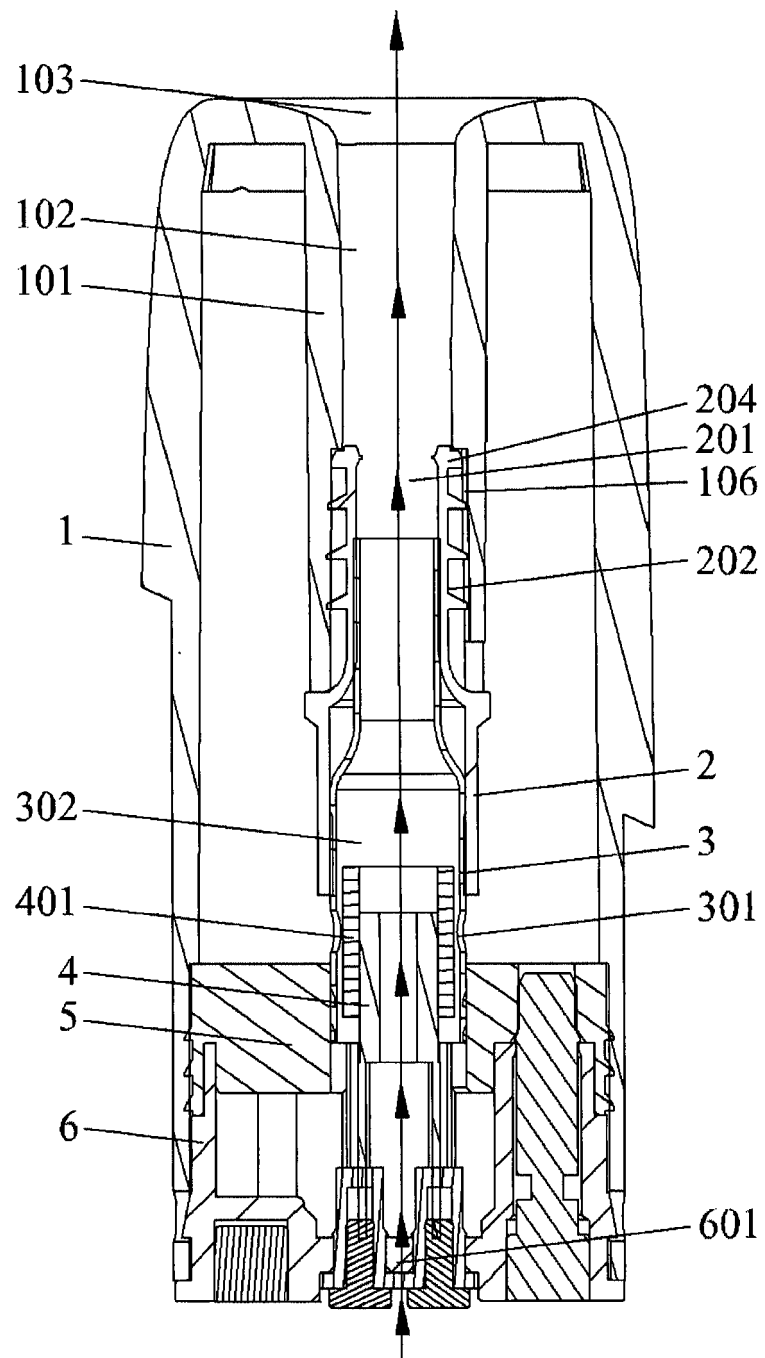


FIG. 6

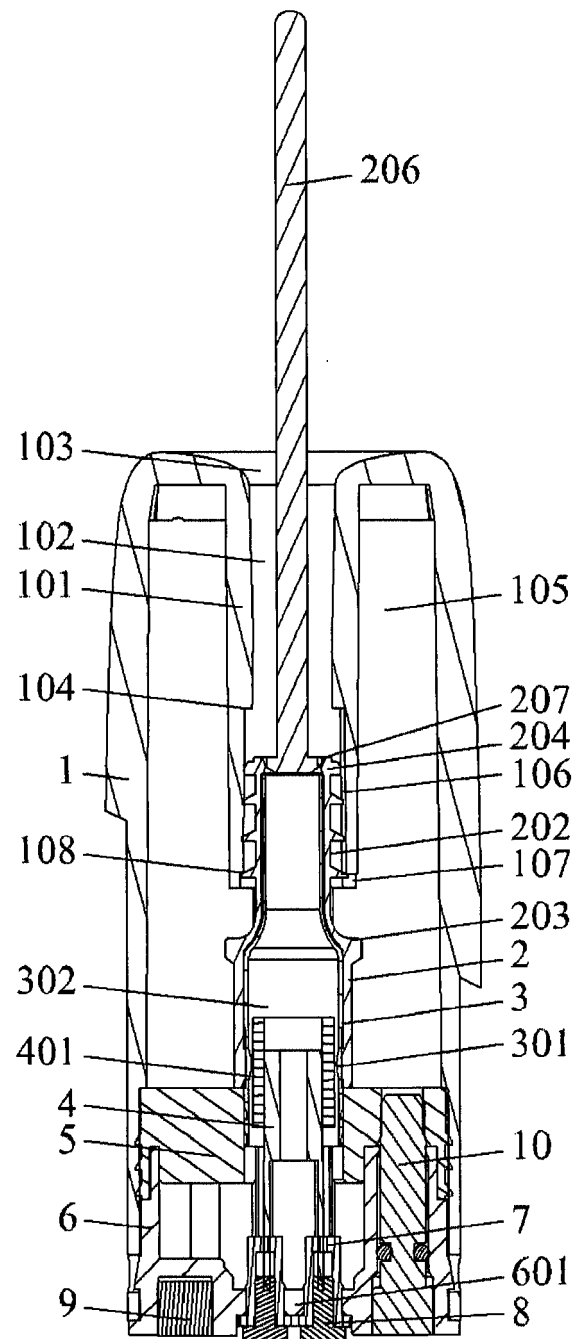


FIG. 7



EUROPEAN SEARCH REPORT

Application Number

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			A24F
Place of search		Date of completion of the search	Examiner
Munich		5 April 2022	Kock, Søren
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

**ANNEX TO THE EUROPEAN SEARCH REPORT
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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05-04-2022

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