



(11)

EP 3 725 170 A1

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
21.10.2020 Bulletin 2020/43

(51) Int Cl.:
A24F 40/10 (2020.01)
A24F 40/42 (2020.01)
A24F 40/40 (2020.01)

(21) Application number: **20170262.8**

(22) Date of filing: **18.04.2020**

(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

(71) Applicant: **Shenzhen Innokin Technology Co., Ltd.**
Shenzhen Guangdong 518104 (CN)

(72) Inventor: **Lei, YUE**
SHENZHEN, 518104 (CN)

(74) Representative: **Hirsch & Partners**
12-14, rue Jean Nicot
75007 Paris (FR)

(30) Priority: **19.04.2019 CN 201920546310 U**
30.04.2019 CN 201920623220 U
02.05.2019 CN 201920631424 U
03.05.2019 CN 201920647289 U

(54) **ATOMIZATION GENERATING DEVICE HAVING A LEAK-PROOF STRUCTURE**

(57) An atomization generating device includes a cartridge (1) including an E-liquid storage tank (19), a bottom base (132), and a vapor channel. The vapor channel (16) is connected with an external environment through a cartridge mouthpiece (17). An atomizing core (15) is disposed at the bottom base and at a lower end of the vapor channel. The atomizing core includes an E-liquid inlet (151). The atomization generating device also includes a main body (3) including a receiving chamber (31). The cartridge (2) includes a leak-proof structure configured to be mechanically co-movable with the cartridge mouthpiece to open and close the E-liquid inlet. The leak-proof structure is configured with a first position and a second position. When the leak-proof structure is at the first position, the E-liquid inlet is closed to block an E-liquid from entering the atomizing core. When the leak-proof structure is at the second position, the E-liquid inlet is open to guide the E-liquid into the atomizing core.

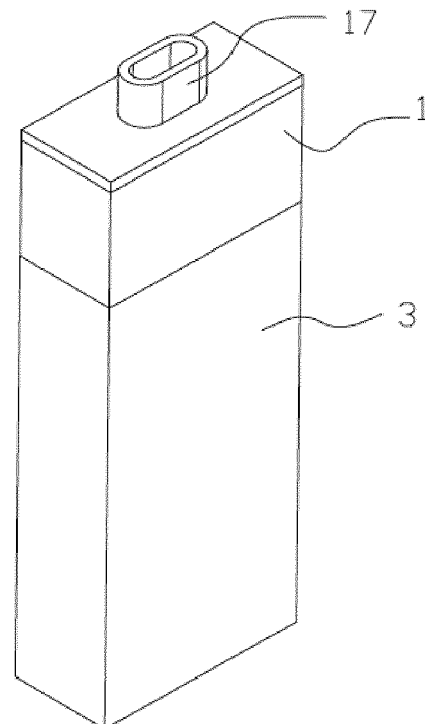


FIG. 1

EP 3 725 170 A1

Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This patent application claims priority to Chinese Utility Model Application Nos. CN201920546310.1, filed on April 19, 2019, CN201920623220.8, filed on April 30, 2019, CN201920631424.6, filed on May 2, 2019, and CN201920647289.4, filed on May 3, 2019.

TECHNICAL FIELD

[0002] The present disclosure relates to an atomization generating device, and more specifically, to an atomization generating device having a leak-proof structure.

BACKGROUND

[0003] A currently available electronic cigarette, also known as an atomization generating device, is typically portable. The electronic cigarette typically includes a cartridge and a main body. An upper portion of the cartridge is provided with an electronic cigarette liquid ("E-liquid") storage tank, and a lower portion is provided with a bottom base and an atomizing core disposed on the bottom base. A middle portion of the bottom base is provided with an air inlet connected with the atomizing core. The upper portion of the cartridge is provided with an air outlet, i.e., a cigarette mouthpiece, which is connected with an external environment. The air inlet and the air outlet are connected through a vapor channel. A side wall of the vapor channel is provided with an E-liquid inlet connected with the E-liquid storage tank. The atomizing core disposed on the bottom base is provided in the vapor channel. That is, the atomizing core is connected with the external environment through the vapor channel. The atomizing core includes an E-liquid guiding body and a heating wire. The E-liquid guiding body absorbs the E-liquid from the E-liquid storage tank through the E-liquid inlet. The E-liquid stored in the E-liquid storage tank continuously flows to the E-liquid guiding body through the E-liquid inlet. After the heating wire heats the E-liquid already absorbed by the E-liquid guiding body to atomize the E-liquid, the E-liquid guiding body continues to absorb additional E-liquid from the E-liquid storage tank. The upper portion of the main body of the electronic cigarette (or atomization generating device) is provided with a receiving chamber configured to receive or accommodate the cartridge. The lower portion of the main body is provided with an atomizing core power supply unit including an electrical circuit board, a battery, and docking terminals. The battery is connected with the electrical circuit board. The electrical circuit board is connected with the docking terminals. A lower surface of the cartridge is provided with conductive terminals configured to dock with the docking terminals of the main body to supply electric power to the atomizing core. Because the E-liquid of the

cartridge is typically connected with the external environment through the E-liquid guiding body, the vapor channel, and the cartridge mouthpiece, the connection is maintained even when the electronic cigarette is not used. If, during a movement, such as when the electronic cigarette is transported, or is carried by a user, the E-liquid may be subject to the vibration caused by the external environment. It is likely that the E-liquid may leak out of the electronic cigarette to the external environment through the vapor channel and the cartridge mouthpiece, causing waste and contamination of the environment. In addition, the user experience is adversely affected.

SUMMARY

[0004] The objective of the present disclosure is to overcome the defects or disadvantages of the existing technologies. The present disclosure provides an atomization generating device including a leak-proof structure, which has characteristics of E-liquid leaking proof, and novel design.

[0005] The atomization generating device provided by embodiments of the present disclosure includes a leak-proof structure. The leak-proof structure includes characteristics of opening an E-liquid injection hole and opening an E-liquid flow path when in use, and closing the E-liquid flow path when not in use to avoid E-liquid leak. The disclosed leak-proof structure can effectively avoid the outflow and leakage of the E-liquid due to vibration caused by the external environment when not in use. The leak-proof structure has a simple structure and a strong utility. The structure is compact and the operation is convenient.

[0006] The present disclosure can be realized as follows:

[0007] an atomization generating device having a leak-proof structure, including:

[0008] a cartridge including an E-liquid storage tank disposed at an upper portion, a bottom base disposed at a lower portion, and a vapor channel configured to connect the upper portion and the lower portion of the cartridge, meaning the vapor channel extends throughout the upper portion and the lower portion. The vapor channel is connected with an external environment through a cartridge mouthpiece disposed at a top end of the vapor channel. An atomizing core is disposed on the bottom base. The atomizing core is disposed at a bottom end of the vapor channel and is connected with the external environment. The atomizing core includes an E-liquid inlet connected with the E-liquid storage tank.

[0009] a main body including a receiving chamber provided at an upper portion for receiving the cartridge. A power supply unit is provided at a lower portion of the main body and configured to provide electric power to the atomizing core;

[0010] in the disclosed configuration, the cartridge also includes a leak-proof structure. The leak-proof structure is configured to be mechanically co-movable with the car-

tridge mouthpiece to open and close the E-liquid inlet from inside the atomization generating device. The leak-proof structure is configured with a first position and a second position. When the leak-proof structure is at the first position, the cartridge mouthpiece is at a non-operating position, and the E-liquid inlet of the atomizing core is closed to block the E-liquid from entering the atomizing core. When the leak-proof structure is at the second position, the cartridge mouthpiece is at an operating position, and the E-liquid inlet of the atomizing core is open to guide the E-liquid into the atomizing core.

[0011] In some embodiments, a center line of the cartridge can be regarded as an axis of the atomization generating device. The axis is configured in the up-down direction. The switch between the non-operating position and the operating position of the cartridge mouthpiece can be a rotation around the axis or a translation along the axis.

[0012] Through the co-motion between the leak-proof structure and the cartridge mouthpiece, the supply and block of the E-liquid can be realized through simple assembling operation of the cartridge or the operation of the electronic cigarette. Through simple daily use operations, and without relying on other tools, a user can conveniently open and close the E-liquid inlet of the atomizing core inside the atomization generating device. Leakage phenomenon that may be caused by the open and close operations of the E-liquid flow path can be effectively avoided. The disclosed leak-proof structure has a simple structure and a strong utility. The structure is compact, and the operations are convenient.

[0013] The leak-proof structure is based on the mechanical co-motion configuration with the cartridge mouthpiece. That is, the leak-proof structure is mechanically linked with the cartridge mouthpiece. The two structures can synchronously operate to realize the switch respective relative positions. Therefore, simple operations performed external to the atomization generating device can realize the open and close of the E-liquid flow path, and the open and close of an air flow path inside the atomization generating device. The disclosed mechanical co-motion structure can maintain the independency of the cartridge. Through the double-safety configurations, i.e., under the condition of the internal structure of the cartridge already having a certain leak-proof function, by adding the dedicated leak-proof structure mechanically co-movable with the cartridge mouthpiece at the cartridge, the leak-proof function of the cartridge can be further improved, thereby realizing a double-safety structure for the leak-proof function of the cartridge. Compared to the existing technologies, the technical solution provided by the present disclosure can significantly improve the sealing performance of the cartridge for the E-liquid. The E-liquid is not in contact with the external environment whether in transportation or in an idle state, thereby maintaining the original texture of the E-liquid. As a result, the degradation in the texture of the E-liquid caused by the evaporation of the E-liquid itself can be

avoided. Through the mechanical co-motion structure design, it makes it clearer for the user to recognize when the E-liquid can be used. This provides a reminder function. After the user obtains the atomization generating device, i.e., the electronic cigarette, the user can immediately know the state of the electronic cigarette. If the electronic cigarette is in an idle state, the user may switch the electronic cigarette to the operating state to use the electronic cigarette, and does not need to determine whether the E-liquid flow path is open. After the use, the user may conveniently switch the atomization generating device, i.e., the electronic cigarette, to the idle state, i.e., to close the air flow path of the electronic cigarette until the next switch to the operating state. The disclosed structure can effectively maintain the texture of the electronic cigarette, improve the performance and lifetime of the electronic cigarette. In the meantime, the disclosed structure can effectively solve the issues of E-liquid leakage causing the waste and contamination, and adversely affecting the user experience.

[0014] According to embodiments of the present disclosure, the atomization generating device having the leak-proof structure can be a flip leak-proof style atomization generating device. In this configuration, the leak-proof structure includes at least a movable frame disposed on the cartridge and a receiving hole disposed at the receiving chamber of the main body.

[0015] The movable frame includes a main body member. A lower surface of the main body member is provided with a slide-holding member and an insertion connection member. A lower portion of the insertion connection member is provided with a blocking member. An elastic member is sleeve-fit onto the insertion connection member. The main body member is hollow inside. The atomizing core is disposed at the main body member. The slide-holding member is configured to be up-down movably disposed at a through hole. The insertion connection member is configured to be up-down movably inserted in a first insertion connection hole. The blocking member is up-down movably disposed at a second insertion connection hole. An upper end of the elastic member is configured to abut against a lower surface of a blocking panel. A lower end of the elastic member is configured to abut against the blocking member. The blocking member is configured to be exposed out of the lower surface of a bottom panel.

[0016] In the disclosed configuration, the receiving hole is provided at a bottom wall of the receiving chamber of the main body. When the bottom portion of the cartridge is mounted into the receiving chamber, the blocking member enters the receiving hole, and the E-liquid inlet is exposed. When the cartridge and the cartridge mouthpiece are rotated 180 degrees and mounted into the receiving chamber, i.e., when the cartridge and the cartridge mouthpiece are rotated 180 degrees in a horizontal plane, the blocking member is pressed by the bottom wall of the receiving chamber, causing the movable frame to move upwardly, such that the main body mem-

ber wraps and seals the E-liquid inlet.

[0017] An upper portion of the main body member is provided with a snap-fitting groove. The snap-fitting groove extends downwardly throughout the slide-holding member. The atomizing core is up-down movably disposed in the snap-fitting groove. A lower portion of the atomizing core abuts against an upper surface of the bottom panel.

[0018] The blocking panel extends downwardly at the through hole to form a connection member. An inner wall of the connection member abuts against an outer wall of the slide-holding member. A lower portion of the connection member abuts against the upper surface of the bottom panel.

[0019] The bottom panel has a rectangular shape. There are two second insertion connection holes. A line connecting the two insertion connection holes can be defined as L1. A line connecting two middle points of two opposing sides of the bottom panel can be defined as L2. L1 and L2 are not on the same line.

[0020] The receiving chamber is formed downwardly from an upper surface of the main body. The receiving chamber has a rectangular shape. There are two receiving holes. A line connecting the two receiving holes can be defined as L3. A line connecting two middle points on two opposing sides of the receiving chamber can be defined as L4. L3 and L4 are not on the same line.

[0021] The cartridge also includes a second air inlet. The main body includes a first air inlet. The first air inlet corresponds to the second air inlet. A projection of the second air inlet in the vertical direction and the second insertion connection hole are on the same line.

[0022] In the present disclosure, when the cartridge is mounted into the receiving chamber along the axis, the blocking member enters the receiving hole. The E-liquid inlet is exposed. At this moment, the E-liquid can flow into the atomizing core through the E-liquid inlet. When the cartridge is mounted into the receiving chamber along the axis, the blocking member enters the receiving hole, and the E-liquid inlet of the atomizing core is exposed. When the cartridge is rotated around the axis for 180 degrees and is mounted into the receiving chamber, the blocking member is pressed, causing the movable frame to move upwardly. The main body member wraps the E-liquid inlet of the atomizing core. This configuration can effectively avoid the phenomenon of E-liquid leaks out due to vibration of the external environment when not in use. The disclosed configuration has a simple structure and a strong utility. The structure is compact and the operations are convenient.

[0023] According to the embodiments of the present disclosure, the atomization generating device having the leak-proof structure may be a clutch lock style atomization generating device. In this device, the leak-proof structure includes at least a movable frame disposed on the cartridge and a protrusion member disposed on the receiving chamber of the main body.

[0024] The cartridge of the clutch lock style atomization

generating device includes:

[0025] an accommodation chamber. An inner wall of the accommodation chamber is provided with a blocking panel. The blocking panel includes, from an upper portion to a lower portion, a through hole and a first insertion connection hole. A bottom portion of the accommodation chamber is provided with a bottom panel. The bottom panel is provided with a second insertion connection hole. The upper portion of the accommodation chamber is provided with an upper cover. The vapor channel is provided on the upper cover.

[0026] a movable frame including a main body member. A lower surface of the main body member abuts against the upper surface of the blocking panel. A slide-holding member extends downwardly from an outer side of the main body member. A blocking member extends outwardly from the slide-holding member. The slide-holding member extends through the first insertion connection hole and the second insertion connection hole. The blocking member is located between the blocking panel and the bottom panel. A press-connection member extends upwardly from an inner side of the main body member.

[0027] In the disclosed configuration, the atomizing core is disposed at the through hole and fixed at the bottom end of the vapor channel. The E-liquid inlet of the atomizing core is located above the blocking panel.

[0028] In the disclosed configuration, the protrusion member includes a first protrusion member and a second protrusion member. The first protrusion member and the second protrusion member protrude from the bottom wall of the receiving chamber.

[0029] In the disclosed configuration, when the cartridge is mounted into the receiving space along the axis, the first protrusion member presses a side of the slide-holding member. The slide-holding member moves inwardly along the blocking panel. The press-connection member seals the E-liquid inlet. When the cartridge and the cartridge mouthpiece are rotated 180 degrees and are mounted into the receiving space, i.e., when the cartridge and the cartridge mouthpiece are rotated 180 degrees in a horizontal plane, the second protrusion member of the cartridge presses another side of the slide-holding member. The slide-holding member moves outwardly along the blocking panel. The press-connection member separates from the E-liquid inlet.

[0030] In some embodiments, two movable frames are opposingly disposed. The bottom portion of the slide-holding member includes an inner slanted surface and an outer slanted surface. Two first protrusion members are located on the straight line L1. Two second protrusion members are located on the straight line L2. The two straight lines L1 and L2 are respectively located at two sides of a center line of the receiving chamber. The first protrusion members are closer to an outer side of the receiving chamber than the second protrusion members.

[0031] In some embodiments, the press-connection member is lower than the bottom end of the vapor chan-

nel. The press-connection member is higher than a height of the E-liquid inlet. The E-liquid inlet is disposed to face in a direction of movement of the movable frames.

[0032] In some embodiments, the press-connection member includes a half-circle shape. The atomizing core includes an atomizing shell. The E-liquid inlet is disposed at the atomizing shell. Inside the atomizing shell are disposed with a heating wire and an E-liquid guiding cotton. The E-liquid guiding cotton winds around the heating wire. The E-liquid guiding cotton corresponds with the E-liquid inlet.

[0033] According to the present disclosure, when the cartridge is mounted into the receiving space along the axis, the first protrusion member presses a side of the slide-holding member. The slide-holding member moves inwardly along the blocking panel. The press-connection member seals the E-liquid inlet. When the cartridge is rotates 180 degrees around the axis and mounted into the receiving space, the second protrusion member presses another side of the slide-holding member. The slide-holding member moves outwardly along the blocking panel. The press-connection member separates from the E-liquid inlet. When not in use, the press-connection member seals the E-liquid inlet. When in use, the press-connection member separates from the E-liquid inlet. The disclosed structure can effectively avoid the E-liquid leakage phenomenon due to vibration of the external environment when not in use. The disclosed structure is simple, and has a strong utility. The structure is compact and the operations are convenient.

[0034] According to the embodiments of the present disclosure, the atomization generating device having the leak-proof structure can be a flip cover shell style atomization generating device. In this device, the leak-proof structure includes at least a sliding groove and a snap-fitting shell engageable with the sliding groove that are disposed on the main body.

[0035] The cartridge includes an outer shell. A top portion of the outer shell is provided with a top panel. The cartridge mouthpiece is up-down movably disposed at the top panel. The outer shell also includes a bottom panel disposed at an opening of a lower portion of the outer shell. An upper portion of the bottom panel is mounted with the atomizing core. The top panel, the outer shell, the bottom panel, the vapor channel, and the atomizing core surrounding form an E-liquid storage tank.

[0036] A side wall of the main body is provided with the sliding groove. The sliding groove includes a first snap-holding position and a second snap-holding position.

[0037] The snap-fitting shell of the atomization generating device is configured to cover the cartridge mouthpiece. The snap-fitting shell includes a connection arm and a cap cover. When the connection arm is at the first snap-holding position, the cap cover presses the cartridge mouthpiece. The vapor channel moves downwardly along the axis to seal the E-liquid inlet. When the connection arm is at the second snap-holding position, the

cartridge mouthpiece moves upwardly along the axis, i.e., the cartridge mouthpiece moves upwardly along the axis in the vertical plane. The vapor channel moves upwardly along the axis, such that the E-liquid inlet is exposed in the E-liquid storage tank.

[0038] A snap-fitting groove is depressingly disposed downwardly from the top panel. The vapor channel extends into the snap-fitting groove. A spring is provided between a lower surface of the cartridge mouthpiece and an upper surface of the snap-fitting groove.

[0039] The lower portion of the bottom panel is mounted with a bottom base. The lower portion of the atomizing core is mounted to the bottom base. An upper portion of the bottom base is depressingly provided with a reserved space. The atomizing core includes an atomizing shell, a heating body, and an E-liquid guiding body. The E-liquid inlet is disposed at the atomizing shell. The heating body and the E-liquid guiding body are disposed at the atomizing shell.

[0040] The lower portion of the atomizing shell is mounted with a rubber pad. A metal electrode is provided inside the rubber pad.

[0041] The first snap-holding position is located above the second snap-holding position. When the connection arm is located at the second snap-holding position, the cap cover snap-fits with the lower portion of the main body.

[0042] When the connection arm is at the first snap-holding position, the cap cover presses the cartridge mouthpiece. The vapor channel moves downwardly to seal the E-liquid inlet. At this moment, the electronic cigarette cannot be used. The E-liquid cannot enter the atomizing core through the E-liquid storage tank. This state is suitable for transportation. This state can also avoid the situation of E-liquid leakage due to shake or vibration. When the connection arm is at the second snap-holding position, the cartridge mouthpiece moves upwardly. The vapor channel moves upwardly such that the E-liquid inlet is exposed in the E-liquid storage tank. The E-liquid in the E-liquid storage tank enters the atomizing core through the E-liquid inlet. A normal use of the electronic cigarette can be performed at this moment. The disclosed structure can avoid the phenomenon of E-liquid leakage due to the vibration of the external environment when not in use. The structure is simple, has a strong utility. In addition, the structure is compact and the operations are convenient.

[0043] According to the embodiments of the present disclosure, the atomization generating device having the leak-proof structure can be a semi-idle rotation style atomization generating device. The leak-proof structure includes at least a sliding groove disposed at an upper portion of the vapor channel and a blocking member disposed on the cartridge mouthpiece. The blocking member is inserted into the sliding groove and is configured to push the sliding groove to rotate.

[0044] The cartridge of the atomization generating device includes an outer shell. The top portion of the outer

shell is mounted with a top panel. The vapor channel is movably mounted to the top panel. The upper portion of the vapor channel is provided with a sliding groove. The sliding groove is horizontally disposed. The sliding groove occupies about a length of 1/4 of a circumference of a circle where the vapor channel is located. The atomization generating device includes a bottom panel mounted at an opening of a lower portion of the outer shell. The upper portion of the bottom panel is mounted with the atomizing core. The side wall of the atomizing core is provided with a first E-liquid inlet. The side wall of the vapor channel is provided with a second E-liquid inlet. The top panel, the outer shell, the bottom panel, the vapor channel, and the atomizing core surrounding form the E-liquid storage tank.

[0045] The cartridge mouthpiece is independently disposed at the cartridge. The cartridge mouthpiece includes an inhalation channel. A blocking member is disposed inside the inhalation channel. The blocking member is inserted into the sliding groove. The inhalation channel is connected with the vapor channel.

[0046] When not in use, the first E-liquid inlet and the second E-liquid inlet are interposingly disposed. When in use, the blocking member semi-idle rotates for 90 degrees inside the sliding groove. The vapor channel does not rotate. Then the blocking member pushes the sliding groove to rotate, such that the vapor channel and the cartridge mouthpiece rotate for 90 degrees around the axis, i.e., the cartridge mouthpiece rotates in the horizontal plane for 180 degrees in accumulation. The first E-liquid inlet and the second E-liquid inlet are connected.

[0047] In some embodiments, a snap-fitting groove is depressingly disposed downwardly from the top panel. The vapor channel can rotatably inserts into the snap-fitting groove. The sliding groove of the vapor channel is exposed to the snap-fitting groove.

[0048] In some embodiments, a trough is provided downwardly from the upper surface of the vapor channel. The trough is connected with the sliding groove. The trough is located at an end of the sliding groove.

[0049] In some embodiments, a partition panel is mounted inside the outer shell. The partition panel is located between the bottom panel and the top panel. The partition panel is provided with a fixing hole. The atomizing core is fixed to the fixing hole. The E-liquid inlet is located above the partition panel. The partition panel, the bottom panel, and the outer shell form a reserved E-liquid tank. A first air intake channel is provided at a side wall of the outer shell below the partition panel. The atomizing core is provided with a second air intake channel. The second air intake channel is located below the partition panel. The second air intake channel extends first inwardly and then upwardly. The second air intake channel and the vapor channel are connected.

[0050] In some embodiments, the blocking member is located at a middle position of the inhalation channel. The blocking member has gaps with the two ends of the inhalation channel.

[0051] When not in use, the first E-liquid hole and the second E-liquid hole are interposingly disposed. When in use, the blocking member idle-rotates for 90 degrees around the axis in the sliding groove. The vapor channel does not rotate. Then the blocking member presses the sliding groove to rotate, causing the vapor channel and the cartridge mouthpiece to rotate for 90 degrees together around the axis. The first E-liquid inlet and the second E-liquid inlet are connected. The disclosed structure can effectively avoid the E-liquid outflow and leakage phenomenon due to the vibration of the external environment when not in use. The disclosed structure is simple and has a strong utility. The structure is compact and the operations are convenient.

BRIEF DESCRIPTION OF THE DRAWINGS

[0052] To better explain the technical solutions of the present disclosure and of the conventional technologies, the accompany drawings that are referred to when describing the present disclosure or the conventional technologies will be briefly introduced. Obviously, the accompanying drawings described below are only some embodiments of the present disclosure. A person having ordinary skills in the art can derive other drawings based on these drawings without creative labor.

FIG. 1 is an overall perspective view of an electronic cigarette according to an embodiment of the present disclosure;

FIG. 2 is an exploded view of the overall perspective view of the electronic cigarette shown in FIG. 1, according to an embodiment of the present disclosure;

FIG. 3 is an exploded view of the overall perspective view of the electronic cigarette shown in FIG. 1, according to an embodiment of the present disclosure;

FIG. 4 is an exploded view of the overall perspective view of the electronic cigarette shown in FIG. 1, according to an embodiment of the present disclosure;

FIG. 5 is a cross-sectional view of the overall perspective view of the electronic cigarette shown in FIG. 1 when in use, according to an embodiment of the present disclosure;

FIG. 6 is a cross-sectional view of the overall perspective view of the electronic cigarette shown in FIG. 1 when not in use, according to an embodiment of the present disclosure;

FIG. 7 is a bottom view of a cartridge of the electronic cigarette shown in FIG. 1, according to an embodiment of the present disclosure;

FIG. 8 is a side view of a cartridge of the electronic cigarette shown in FIG. 1, according to an embodiment of the present disclosure;

FIG. 9 is a top view of a main body of the electronic cigarette shown in FIG. 1, according to an embodiment of the present disclosure;

FIG. 10 is another overall perspective view of an electronic cigarette, according to another embodi-

ment of the present disclosure;

FIG. 11 is another exploded view of the perspective view of the electronic cigarette shown in FIG. 10, according to another embodiment of the present disclosure;

FIG. 12 is a perspective view of a cartridge of the electronic cigarette shown in FIG. 10, according to another embodiment of the present disclosure;

FIG. 13 is an exploded view of the overall perspective view of the cartridge of the electronic cigarette shown in FIG. 12, according to an embodiment of the present disclosure;

FIG. 14 is a cross-sectional view of the electronic cigarette shown in FIG. 10 when in use, according to an embodiment of the present disclosure;

FIG. 15 is a cross-sectional view of the electronic cigarette shown in FIG. 10 when not in use, according to an embodiment of the present disclosure;

FIG. 16 is a perspective view of the electronic cigarette when a snap-fitting shell is at a first snap-holding position, according to another embodiment of the present disclosure;

FIG. 17 is an exploded view of the perspective view of the electronic cigarette when the snap-fitting shell is at the first snap-holding position shown in FIG. 16, according to an embodiment of the present disclosure;

FIG. 18 is an exploded view of a cartridge of the electronic cigarette shown in FIG. 16, according to another embodiment of the present disclosure;

FIG. 19 is a cross-sectional view of an atomizing core of the electronic cigarette shown in FIG. 16, according to an embodiment of the present disclosure;

FIG. 20 is a cross-sectional view of the electronic cigarette shown in FIG. 16 when a snap-fitting shell is at a first snap-holding position, according to an embodiment of the present disclosure;

FIG. 21 is a perspective view of the electronic cigarette shown in FIG. 16 when a snap-fitting shell is at a second snap-holding position, according to an embodiment of the present disclosure;

FIG. 22 is an exploded view of the perspective view of the electronic cigarette shown in FIG. 16 when a snap-fitting shell is at a second snap-holding position, according to an embodiment of the present disclosure;

FIG. 23 is a cross-sectional view of the electronic cigarette shown in FIG. 16 when a snap-fitting shell is at a second snap-holding position, according to an embodiment of the present disclosure;

FIG. 24 is a cross-sectional view of an atomizing core, according to another embodiment of the present disclosure;

FIG. 25 is a perspective view of an electronic cigarette, according to another embodiment of the present disclosure;

FIG. 26 is an exploded view of the perspective view

of an electronic cigarette shown in FIG. 25, according to another embodiment of the present disclosure;

FIG. 27 is an exploded view of a perspective view of a cartridge of the electronic cigarette shown in FIG. 25, according to another embodiment of the present disclosure; and

FIG. 28 is a cross-sectional view of an atomizing core of the electronic cigarette shown in FIG. 25, according to another embodiment of the present disclosure.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0053] The technical solution of the embodiments of the present disclosure will be described in detail with reference to the accompanying drawings. The described embodiments are merely some embodiments of the present disclosure, and are not all embodiments of the present disclosure. Based on the embodiments of the present disclosure, a person having ordinary skills in the art can obtain other embodiments without creative labor. Such embodiments all fall within the scope of protection of the present disclosure.

[0054] As shown in FIG. 1 - FIG. 9, embodiments of the present disclosure provide an atomization generating device having a leak-proof structure. The atomization generating device having the leak-proof structure may be a flip leak-proof style atomization generating device. The atomization generating device includes: a cartridge 1 including an accommodation chamber 11. An inner wall of the accommodation chamber 11 may include a blocking panel 12. The blocking panel 12 may include a first through hole 121 and a first insertion connection hole 123 extending from a top portion to a bottom portion. A bottom panel 13 may be disposed at a bottom portion of the accommodation chamber 11. The bottom panel 13 may be provided with a second insertion connection hole 131. An upper cover 14 may be provided at an upper portion of the accommodation chamber 11. The upper cover 14 may be provided with a vapor channel 16. An upper portion of the vapor channel 16 may be provided with a cartridge mouthpiece 17. The device may also include a movable frame 20 including a main body member 21. A slide-holding 22 and an insertion connection member 23 may be disposed at a lower surface of the main body member 21. A blocking member 24 may be disposed at a lower end of the insertion connection member 23. An elastic member, such as a spring 25, may be sleeve-fit onto the insertion connection member 23. The main body member 21 may be hollow. An atomizing core 15 may be mounted at the main body member 21. A bottom end of the vapor channel 16 may be fixed at the atomizing core 15. An E-liquid inlet 151 may be provided at the atomizing core 15. The slide-holding member 22 may be configured to up-down movably disposed at the through hole 121. The insertion connection member 23 may be up-down movably inserted into the first insertion connection hole 123. The blocking member 24 may be

up-down movably mounted at the second insertion connection hole 131. An upper end of the spring 25 may abut against a lower surface of the blocking panel 12. A lower end of the spring 25 may abut against the blocking member 24. The blocking member 24 may be exposed from a lower surface of the bottom panel 13. The device may also include a main body 3. An upper portion of the main body 3 may be provided with a receiving chamber 31. A bottom wall of the receiving chamber 31 may be provided with a receiving hole 32. In this configuration, when the cartridge 1 is mounted into the receiving chamber 31 along the axis, the blocking member 24 enters the receiving hole 32, and the E-liquid inlet 151 is exposed. When the cartridge 1 rotates for 180 degrees around the axis and is mounted into the receiving chamber 31, the blocking member 24 is subject to a pressing force of the bottom wall of the receiving chamber 31, causing the movable frame 20 to move upwardly. The main body member 21 wraps the E-liquid inlet 151. The axis can be understood as a straight line extending in the up-down direction, such as a plumb line. The cartridge 1 may be mounted into the receiving chamber 31 in a direction opposite to the plumb line. When the blocking member 24 enters the receiving hole 32, the E-liquid can enter the atomizing core 15 (the heating member). If the cartridge 1 is rotated for 180 degrees around the plumb line, i.e., the cartridge and the cartridge mouthpiece are rotated for 180 degrees within a horizontal plane, the cartridge 1 can also be mounted into the receiving chamber 31. However, the blocking member 24 may not enter the receiving hole 32. At this moment, the blocking member 24 is subject to a pressing force from the bottom wall, causing the blocking member 24 to move upwardly. When the cartridge is retrieved from the receiving chamber, the spring 25 pushes the blocking member 24 of the movable frame, causing the blocking member 24 to move downwardly. An upper end of the spring 25 presses a lower surface of the blocking panel 12. The movable frame moves downwardly. The slide-holding member slides downwardly, such that the E-liquid inlet is exposed, returning to a position under a normal use.

[0055] A snap-fitting groove 26 may be downwardly provided from an upper surface of the main body member 21. The snap-fitting groove 26 may extend downwardly throughout the slide-holding member 22. The atomizing core 15 may be up-down movably mounted at the snap-fitting groove 26. The lower portion of the atomizing core 15 may abut against the upper surface of the bottom panel 13. A connection member 122 may downwardly extend from the block panel 12 at the through hole 121. The inner wall of the connection member 122 may abut against the outer wall of the slide-holding member 22. The lower end of the connection member 122 may abut against the upper surface of the bottom panel 13.

[0056] The bottom panel 13 may have a rectangular shape. There are two second insertion connection holes 131. A line connecting the two second insertion connection holes 131 may be defined as L1. A line connecting

two middle points on two opposing sides of the bottom panel 13 may be defined as L2. L1 and L2 are not on the same line. The receiving chamber 31 may be formed downwardly from the upper surface of the main body 3. The receiving chamber 31 may have a rectangular prism shape.

[0057] Two receiving holes 32 may be provided. A line connecting the two receiving holes 32 may be defined as L3. A line connecting two middle points on two opposing sides of the receiving chamber 31 may be defined as L4. L3 and L4 are not on the same line. A first air inlet 33 may be provided at the main body 3. A second air inlet 18 may be provided at the cartridge 1. The first air inlet 33 may correspond to the second air inlet 18. The projection of the second air inlet 18 in the vertical direction may be on the same line as the second insertion hole 131. This type of interposing configuration, or called biased configuration, may effectively ensure that only one position is correct when the cartridge 1 is inserted into the receiving chamber 31. Only at the correct position can the electronic cigarette be used normally. The position where the blocking member 24 enters the receiving hole 32 is the correct position. At this moment, the first air inlet 33 and the second air inlet 18 may coincide with one another. External air may enter the atomizing core 15, to carry away the atomized E-liquid. The main body 3 may also be provided with a battery, a control panel, and conductive terminals. The battery is a power source. The control panel may control the output of the electrical current. The battery may be connected with the control panel. The control panel may be connected with the conductive terminals. The cartridge 1 may also be provided with connection terminals. The connection terminals may be connected with the atomizing core 15 through lead wires to provide electric energy for the atomizing core 15.

[0058] As shown in FIGs. 10 - 15, the present disclosure provides a clutch lock style atomization generating device, including: a cartridge 1. A center line of the cartridge 1 is an axis A. The cartridge 1 includes an accommodation chamber 11. A blocking panel 12 may be disposed at an inner wall of the accommodation chamber 11. The blocking panel 12 may include a through hole 121 and a first insertion connection hole 123 extending from an upper portion to a bottom portion. A bottom panel 13 may be provided at a bottom portion of the accommodation chamber 11. A second insertion connection hole 131 may be provided at the bottom panel 13. An upper cover 14 may be provided at an upper portion of the accommodation chamber 11. A vapor channel 16 may be provided at the upper cover 14. A cartridge mouthpiece 17 may be provided at the upper portion of the vapor channel 16. The device may also include a movable frame 20 including a main body member 21. A lower surface of the main body member 21 may abut against an upper surface of the blocking member 12. A slide-holding member 22 may extend downwardly from an outer side of the main body member 21. A blocking member 24 may extend outwardly from the slide-holding member 22. The

slide-holding member 22 may extend through the first insertion connection hole 123 and the second insertion connection hole 131. The blocking member 24 may be located between the blocking panel 12 and the bottom panel 13. A press-connection member 27 may extend upwardly from an inner side of the main body member 21. The device may also include an atomizing core 15 mounted at the through hole 121, such that the atomizing core 15 may be fixed at the bottom end of the vapor channel 16. The atomizing core 15 may include an E-liquid inlet 151. The E-liquid inlet 151 may be located above the blocking panel 12. The device may include a main body 3. A receiving chamber 31 may be disposed at an upper portion of the main body 3. A first protrusion member 311 and a second protrusion member 312 may protrude from a bottom wall of the receiving chamber 31. When the cartridge 1 is mounted into the receiving chamber 31 along the axis A, the first protrusion member 311 may press a side of the slide-holding member 22. The slide-holding member 22 may move inwardly along the blocking panel 12. The press-connection member 27 may seal the E-liquid inlet 151. When the cartridge 1 is rotated for 180 degrees around the axis A and is mounted into the receiving chamber 31, i.e., when the cartridge and the cartridge mouthpiece are rotated for 180 degrees in the horizontal plane, the second protrusion member 312 may press a side of the slide-holding member 22. The slide-holding member 22 may move outwardly along the blocking panel 12. The press-connection member 27 may separate from the E-liquid inlet 151.

[0059] The two movable frames 20 may be opposingly disposed. A bottom portion of the slide-holding member 22 may include an inner slanted surface 24 and an outer slanted surface 25. Two first protrusion members 311 may be located on the straight line L1. Two second protrusion members 312 may be located on the straight line L2. The straight line L1 and the straight line L2 may be respectively located at two sides of the center line of the receiving chamber 31. The first protrusion members 311 may be closer to an outer side of the receiving chamber 31 than the second protrusion members 312.

[0060] The press-connection member 27 may be lower than a bottom end of the vapor channel 16. The press-connection member 27 may be higher than the height of the E-liquid inlet 151. The E-liquid inlet 151 may face in a direction of movement of the movable members.

[0061] The press-connection member 27 may include a half-circle shape. The atomizing core 15 may include an atomizing shell. The E-liquid inlet 151 may be provided at the atomizing shell. A heating wire and an E-liquid guiding cotton may be provided inside the atomizing shell. The E-liquid guiding cotton may wind around the heating wire. The E-liquid guiding cotton may correspond to the E-liquid inlet 151.

[0062] According to the present disclosure, when the cartridge 1 is mounted into the receiving chamber 31 along the axis A, the axis A may be understood as the plumb line. When the cartridge 1 is vertically mounted

into the receiving chamber 31 in the up-down direction, the first protrusion member 311 may press a side of the slide-holding member 22. The first protrusion member 311 may press an outer slanted surface 222. The slide-holding member 22 may move inwardly along the blocking panel 12. The press-connection member 27 may seal the E-liquid inlet 151. In this situation, the cartridge 1 and the main body 3 may be transported together, to effectively avoid the E-liquid leakage caused by vibration. When the cartridge 1 is rotated for 180 degrees and mounted into the receiving chamber 31, i.e., when the cartridge and the cartridge mouthpiece are rotated for 180 degrees within the horizontal plane, i.e., horizontally rotated for 180 degrees around the plumb line (which serves as a rotation axis), the second protrusion member 312 may press another side of the slide-holding member 22. The second protrusion member 312 may press the inner slanted surface 221. The slide-holding member 22 may move outwardly along the blocking panel 12. The press-connection member 27 may separate from the E-liquid inlet 151. The E-liquid may enter the E-liquid inlet 151 through a gap between the press-connection member 27 and the atomizing shell, and then enter the E-liquid cotton through the E-liquid inlet 151, such that the heating wire may atomize the E-liquid. The atomized E-liquid may flow out through the vapor channel 16 to the cartridge mouthpiece 17 for consumption by a user. When not in use, the press-connection member 27 may seal the E-liquid inlet 151. When in use, the press-connection member 27 may separate from the E-liquid inlet 151. The disclosed structure can effectively avoid the E-liquid flow out and leak phenomenon due to vibration of external environment when not in use. The disclosed structure is simple and has a strong utility. The structure is compact and the operations are convenient.

[0063] As shown in FIG. 16 - FIG. 24, the present disclosure provides a flip cover shell style atomization generating device. The device includes: a cartridge 1 including an outer shell 10. A top panel 102 may be disposed at a top portion of the outer shell 10. A cartridge mouthpiece 17 may be up-down movably mounted at the top panel 102. A vapor channel 16 may be disposed at a lower portion of the cartridge mouthpiece 17. The device may also include a bottom panel 13 mounted at an opening of a lower portion of the outer shell 10. An atomizing core 15 may be disposed at an upper portion of the bottom panel 13. The atomizing core 15 and the cartridge mouthpiece 17 may be connected through the vapor channel 16. An E-liquid inlet 151 may be disposed at a side wall of the atomizing core 15. The top panel 102, the outer shell 10, the bottom panel 13, the vapor channel 16, and the atomizing core surroundingly form an E-liquid storage tank 19. The device may also include a main body 3. A receiving chamber 31 may be disposed at an upper portion of the main body 3. A battery, an electrical circuit board, and conductive terminals may be disposed inside the main body 3. The battery may be connected with the electrical circuit board. The electrical circuit board may

be connected with the conductive terminals. The conductive terminals may be exposed in the receiving chamber 31. A sliding groove 34 may be disposed at a side wall of the main body 3. The sliding groove 34 may include a first snap-holding position 341 and a second snap-holding position 342. The device may also include a snap-fitting shell 4 including a connection arm 42 and a cap cover 41. When the connection arm 42 is at the first snap-holding position 341, the cap cover 41 may press the cartridge mouthpiece 17. The vapor channel 16 moves downwardly along the axis to seal the E-liquid inlet 151. When the connection arm 42 is at the second snap-holding position 342, the cartridge mouthpiece 17 moves upwardly along the axis. The vapor channel 16 moves upwardly along the axis, such that the E-liquid inlet 151 is exposed to the E-liquid storage tank 19.

[0064] A snap-fitting groove 103 may be depressingly disposed downwardly from the top panel 102. The vapor channel 16 may be inserted at the snap-fitting groove 103. An elastic member, such as a spring 25, may be disposed between a lower surface of the cartridge mouthpiece 17 and an upper surface of the snap-fitting groove 103. When the cartridge mouthpiece 17 moves downwardly along the axis, the spring 25 may improve the hand feeling of the movement of the cartridge mouthpiece 17. When the cartridge mouthpiece 17 moves upwardly along the axis, the spring 25 may push the cartridge mouthpiece 17 to move upwardly.

[0065] A bottom base 132 may be disposed at a lower portion of the bottom panel 13. A lower portion of the atomizing core 15 may be disposed at the bottom base 132. A reserved space 133 may be depressingly disposed at an upper portion of the bottom base 132. The atomizing core 15 may include an atomizing shell 152, a heating body, and an E-liquid guiding body. The E-liquid inlet 151 may be disposed at the atomizing shell 152. The heating body and the E-liquid guiding body may be mounted at the atomizing shell 152.

[0066] A rubber pad 153 may be mounted at a lower portion of the atomizing shell 152. A metal electrode 154 is disposed inside the rubber pad 153. The metal electrode 154 may be connected with the conductive terminals to conduct electricity. The first snap-holding position 341 may be located above the second snap-holding position 342. When the connection arm 42 is at the second snap-holding position 342, the cap cover 41 may snap-fit with a lower portion of the main body 3.

[0067] When the connection arm 42 is at the first snap-holding position 341, the cap cover 41 may press the cartridge mouthpiece 17. The vapor channel 16 may move downwardly to seal the E-liquid inlet 151. At this moment, the electronic cigarette cannot be used normally. The E-liquid cannot enter the atomizing core 15 through the E-liquid storage tank 19. This state is suitable for transportation. This state can avoid the situation of E-liquid leakage due to vibration and shaking. When the connection arm 42 is at the second snap-holding position 342, the cartridge mouthpiece 17 moves upwardly, i.e.,

the cartridge mouthpiece moves upwardly in the vertical plane. The vapor channel 16 moves upwardly, such that the E-liquid inlet 151 is exposed at the E-liquid storage tank 19. The E-liquid stored in the E-liquid storage tank 19 may flow into the atomizing core 15 through the E-liquid inlet 151, thereby realizing the normal use of the electronic cigarette. The connection arm may move upwardly from the first snap-holding position 341. Then the connection arm 42 may be rotated for 180 degrees, such that the connection arm 42 is rotated to a lower position. The connection arm 42 may be pushed upwardly. The connection arm 42 moves upwardly to the second snap-holding position 342, thereby accomplishing the switch between the first snap-holding position 341 and the second snap-holding position 342.

[0068] As shown in FIG. 25 - FIG. 28, the present disclosure provides a semi-idle rotation style atomization generating device, including: a cartridge 1 including an outer shell 10. A top panel 102 may be disposed at a top portion of the outer shell 10. A vapor channel 16 may be movably mounted at the top panel 102. A sliding rail 162 may be disposed at an upper portion of the vapor channel 16. The sliding rail 162 may be horizontally disposed. The sliding rail 162 occupies a length that is 1/4 of the circumference of the circle where the vapor channel 16 is located. The device also includes a bottom panel 101 mounted at an opening of a lower portion of the outer shell 10. A through hole 121 may be provided at the bottom panel 101 for mounting an atomizing core 15 at the bottom panel 101. A first E-liquid inlet 151 may be disposed at a side wall of the atomizing core 15. A second E-liquid inlet 161 may be disposed at a side wall of the vapor channel 16. The top panel 102, the outer shell 10, the bottom panel 101, the vapor channel 16, and the atomizing core 15 surroundingly form an E-liquid storage tank 19. The device may also include a main body 3. A receiving chamber 31 may be disposed at an upper portion of the main body 3. A battery, an electrical circuit board, and conductive terminals may be disposed inside the main body 3. The battery may be connected with the electrical circuit board. The electrical circuit board may be connected with the conductive terminals. The conductive terminals may be exposed in the receiving chamber 31. The device may also include a cartridge mouthpiece 17. The cartridge mouthpiece 17 may include an inhalation channel 171. A blocking member 172 may be disposed inside the inhalation channel 171. The blocking member 172 may be inserted into the sliding rail 162. The inhalation channel 171 may be connected with the vapor channel 16.

[0069] When not in use, the first E-liquid inlet 151 and the second E-liquid inlet 161 may be interposingly disposed. When in use, the blocking member 172 may idle-rotate for 90 degrees around the axis in the sliding rail 162. The vapor channel 16 may not rotate. Then the blocking member 172 may push the sliding rail 162 to rotate, causing the vapor channel 16 and the cartridge mouthpiece 17 to rotate together for 90 degrees around

the axis. That is, the cartridge mouthpiece may rotate in the horizontal plane around the axis for 180 degrees in accumulation. The first E-liquid inlet 151 and the second E-liquid inlet 161 may be connected.

[0070] A snap-fitting groove 103 may be depressingly disposed downwardly from the top panel 102. The vapor channel 16 may be rotatably inserted into the snap-fitting groove 103. The sliding rail 162 of the vapor channel 16 may be exposed to the snap-fitting groove 103. A trough 163 may be disposed downwardly from an upper surface of the vapor channel 16. The trough 163 may be connected with the sliding rail 162, and may be located at an end of the sliding rail 162. The blocking member 172 may be located at a middle position of the inhalation channel. Gaps may exist between the blocking member and two ends of the inhalation channel.

[0071] A partition panel 104 may be mounted inside the outer shell 10. The partition panel 104 may be located between the bottom panel 101 and the top panel 102. The partition panel 104 may be provided with a fixing hole 105. The atomizing core 15 may be fixed at the fixing hole 105. The first E-liquid inlet 151 may be located above the partition panel 104. The partition panel 104, the bottom panel 101, and the outer shell 10 may form a reserved E-liquid tank. A first air intake channel 106 may be disposed at a side wall of the outer shell 10 located below the partition panel 104. A second air intake channel 155 may be disposed at the atomizing core 15. The second air intake channel 155 may be located below the partition panel 104. The second air intake channel 155 may extend first inwardly and then upwardly. The second air intake channel 155 may be connected with the vapor channel 16. A heating body and an E-liquid guiding body may be disposed inside the atomizing core 15. The conductive terminals may be connected with the heating body (e.g., a heating wire).

[0072] When in use, the cartridge mouthpiece 17 may be rotated. The blocking member 172 may idle-rotate for 90 degrees around the axis in the sliding rail 162. During this process, the vapor channel 16 may not rotate. At this moment, the blocking member 172 may be located at an edge of the sliding rail 162. When the rotation of the cartridge mouthpiece 17 is continued, the blocking member 172 may push the sliding rail 162 to rotate. The blocking member 172 and the sliding rail 162 may rotate together, such that the vapor channel 16 and the cartridge mouthpiece 17 may together rotate for 90 degrees around the axis. The first E-liquid inlet 151 and the second E-liquid inlet 161 may be connected. At this moment, the cartridge mouthpiece 17 may be used normally for the smoking. During this process, the cartridge mouthpiece 17 is rotated for 180 degrees around the axis. The atomizing core 15 can atomize the E-liquid stored in the E-liquid storage tank 19 in a normal manner. Atomized E-liquid may flow upwardly along the vapor channel 16, and enter the cartridge mouthpiece 17 through the gap between the sliding rail 162 and the blocking member 172. External air may enter the atomizing core 15 through the first

air intake channel 106 and the second air intake channel 155, to carry away the atomized E-liquid. When the cartridge mouthpiece 17 is reversely rotated around the axis for 180 degrees, the blocking member 172 may be rotated for 180 degrees around the axis, in the first 90 degrees the blocking member 172 is idle-rotating, and in the latter 90 degrees, the blocking member 172 causes the vapor channel 16 to rotate in a reverse direction around the axis, such that the first E-liquid inlet 151 and the second E-liquid inlet 161 are interposingly disposed, thereby avoiding the E-liquid stored in the E-liquid storage tank 19 entering into the atomizing core 15. The above described are some embodiments of the present disclosure, and are not intended to limit the scope of the same, which is defined by the following claims.

[0073] The structure disclosed in the present disclosure can effectively avoid the E-liquid outflow and leakage phenomenon caused by vibration of the external environment when the electronic cigarette is not in use. The disclosed structure having a strong utility, is simple, compact and the operations are convenient.

[0074] Any modification, equivalent substitution, and improvement within the spirit and principle of the present disclosure, all fall within the protection scope of the present disclosure.

Claims

1. An atomization generating device, comprising:

a cartridge including:

an E-liquid storage tank disposed at an upper portion of the cartridge;
a bottom base disposed at a lower portion of the cartridge; and
a vapor channel extending throughout the upper portion and the lower portion, wherein the vapor channel is connected with an external environment through a cartridge mouthpiece disposed at a top end of the vapor channel, and
an atomizing core disposed at the bottom base, wherein the atomizing core is disposed at a lower end of the vapor channel, and includes an E-liquid inlet connected with the E-liquid storage tank; and

a main body including:

a receiving chamber configured to receive the cartridge; and
a power supply unit configured to provide an electric power to the atomizing core,

wherein the cartridge includes a leak-proof structure configured to be mechanically co-mov-

able with the cartridge mouthpiece to open and close the E-liquid inlet inside the atomization generating device, and

wherein the leak-proof structure is configured with a first position and a second position: when the leak-proof structure is at the first position, the cartridge mouthpiece is at a non-operating position, and the E-liquid inlet of the atomizing core is closed to block an E-liquid from entering the atomizing core; when the leak-proof structure is at the second position, the cartridge mouthpiece is at an operating position, and the E-liquid inlet of the atomizing core is open to guide the E-liquid into the atomizing core.

2. The atomization generating device of claim 1, wherein the cartridge mouthpiece includes an axis extending in an up-down direction, and a rotation of the cartridge mouthpiece around the axis causes a switching between the non-operating position and the operating position of the cartridge mouthpiece.

3. The atomization generating device of claim 1, wherein the cartridge mouthpiece includes an axis extending in an up-down direction, and a translation of the cartridge mouthpiece along the axis causes a switching between the non-operating position and the operating position of the cartridge mouthpiece.

4. The atomization generating device of claim 2, wherein the leak-proof structure includes a movable frame disposed on the cartridge and a receiving hole disposed at a bottom wall of the receiving chamber of the main body, the movable frame includes:

a hollow main body member, wherein the atomizing core is disposed at the main body member; a slide-holding member and an insertion connection member disposed at a lower surface of the main body member, wherein the slide-holding member is up-down movably mounted to a through hole, the insertion connection member includes an elastic member and is up-down movably inserted into a first insertion connection hole; and

a blocking member disposed at a lower end of the insertion connection member, and up-down movably mounted at a second insertion connection hole, wherein the blocking member is exposed from a lower surface of a bottom panel,

wherein an upper end of the elastic member abuts against a lower surface of a blocking panel, and a lower end of the elastic member abuts against the blocking member, wherein when a bottom portion of the cartridge is

mounted into the receiving chamber, the blocking member enters the receiving hole, and the E-liquid inlet is exposed, and

wherein when the cartridge and the cartridge mouthpiece are rotated for 180 degrees and mounted into the receiving chamber, the blocking member is subject to a pressing force from the bottom wall of the receiving chamber, causing the movable frame to move upwardly, and the main body member to wrap the E-liquid inlet to seal the E-liquid inlet.

5. The atomization generating device of claim 4, wherein

a snap-fitting groove is downwardly disposed from an upper surface of the main body member, the snap-fitting groove extends downwardly throughout the slide-holding member, the atomizing core is up-down movably mounted at the snap-fitting groove, and a lower portion of the atomizing core abuts against an upper surface of the bottom panel, a connection member extends downwardly from the blocking panel at the through hole, an inner wall of the connection member abuts against an outer wall of the slide-holding member, and a lower end of the connection member abuts against the upper surface of the bottom panel,

the bottom panel has a rectangular shape, two second insertion connection holes are included, a line connecting the two second insertion connection holes is L1, a line connecting two middle points on two opposing sides of the bottom panel is L2, L1 and L2 are not on the same line,

the receiving chamber is formed downwardly from an upper surface of the main body, the receiving chamber includes a rectangular prism shape, and two receiving holes are included, a line connecting the two receiving holes is L3, a line connecting two middle points on two opposing sides of the receiving chamber is L4, L3 and L4 are not on the same line.

6. The atomization generating device of claim 4 or 5, wherein

a first air inlet is disposed at the main body, a second air inlet is disposed at the cartridge, the first air inlet corresponds to the second air inlet, and a projection of the second air inlet in a vertical direction is on the same line as the second insertion connection hole.

7. The atomization generating device of claim 2, wherein

the leak-proof structure includes a movable frame disposed on the cartridge and a protrusion member disposed at the receiving chamber of the main body, the cartridge also includes:

an accommodation chamber including a blocking panel disposed at an inner wall of the accommodation chamber, wherein the blocking

panel includes a through hole and a first insertion connection hole extending from an upper portion of the blocking panel to a lower portion of the blocking panel,

wherein a bottom panel is disposed at a bottom portion of the accommodation chamber, the bottom panel including a second insertion connection hole,

wherein an upper cover is disposed at an upper portion of the accommodation chamber, and the vapor channel is disposed at the upper cover, a movable frame including a main body member, wherein a lower surface of the main body member abuts against an upper surface of the blocking panel,

wherein a slide-holding member extends downwardly from an outer side of the main body member, a blocking member extends outwardly from the slide-holding member, the slide-holding member extends throughout the first insertion connection hole and the second insertion connection hole, the blocking member is located between the blocking panel and the bottom panel, and a press-connection member extends upwardly from an inner side of the main body member,

wherein the atomizing core is mounted at the through hole and is fixed to a bottom end of the vapor channel, the E-liquid inlet of the atomizing core is located above the blocking panel,

wherein the protrusion member includes a first protrusion member and a second protrusion member, the first protrusion member and the second protrusion member protrude from a bottom wall of the receiving chamber of the main body,

wherein, when the cartridge is mounted into the receiving chamber along an axis, the first protrusion member presses a side of the slide-holding member to cause the slide-holding member to move inwardly along the blocking panel, and the press-connection member seals the E-liquid inlet, and

wherein, when the cartridge and the cartridge mouthpiece are rotated for 180 degrees and are mounted into the receiving chamber, the second protrusion member of the cartridge presses another side of the slide-holding member to cause the slide-holding member to move outwardly along the blocking panel, and the press-connection member separates from the E-liquid inlet.

8. The atomization generating device of claim 7, wherein

two movable frames are opposingly disposed, a bottom portion of the slide-holding member includes an inner slanted surface and an outer slanted surface,

two first protrusion members are located on a straight

line L1,

two second protrusion members are located on a straight line L2,

the straight line L1 and the straight line L2 are respectively located at two sides of a center line of the receiving chamber, and the first protrusion members are closer to an outer side of the receiving chamber than the second protrusion members,

the press-connection member is lower than the bottom end of the vapor channel,

the press-connection member is higher than a height of the E-liquid inlet, and

the E-liquid inlet is disposed to face in a movement direction of the movable frames.

9. The atomization generating device of claim 7 or 8, wherein

the press-connection member has a half-circle shape, the atomizing core includes an atomizing shell, the E-liquid inlet is disposed at the atomizing shell, and

a heating wire and an E-liquid guiding cotton are disposed inside the atomizing shell, the E-liquid guiding cotton winds around the heating wire, and the E-liquid guiding cotton corresponds to the E-liquid inlet.

10. The atomization generating device of claim 3, wherein

the leak-proof structure includes a sliding groove disposed on the main body and a snap-fitting shell engageable with the sliding groove, the snap-fitting shell is configured to cover the cartridge mouthpiece, the cartridge includes:

an outer shell, wherein a top panel is disposed at a top portion of the outer shell, the cartridge mouthpiece is up-down movably mounted at the top panel; and

a bottom panel mounted at an opening at a lower portion of the outer shell, wherein the atomizing core is mounted at an upper portion of the bottom panel, and the top panel, the outer shell, the bottom panel, the vapor channel, and the atomizing core surroundingly form the E-liquid storage tank,

wherein the sliding groove is disposed at a side wall of the main body, the sliding groove includes a first snap-holding position and a second snap-holding position,

wherein the atomization generating device further includes:

a snap-fitting shell configured to cover the cartridge mouthpiece, wherein the snap-fitting shell includes a connection arm and a cap cover, when the connection arm is at the first snap-holding position, the cap cover presses the car-

tridge mouthpiece, the vapor channel moves downwardly to seal the E-liquid inlet, wherein when the connection arm is at the second snap-holding position, the cartridge mouthpiece moves upwardly in a vertical plane, the vapor channel moves upwardly, and the E-liquid inlet is exposed to the E-liquid storage tank.

11. The atomization generating device of claim 10, wherein

a snap-fitting groove is depressingly disposed downwardly from the top panel, the vapor channel is inserted into the snap-fitting groove, a spring is disposed between a lower surface of the cartridge mouthpiece and an upper surface of the snap-fitting groove, the first snap-holding position is above the second snap-holding position, and when the connection arm is at the second snap-holding position, the cap cover snap-fits with a lower portion of the main body.

12. The atomization generating device of claim 10 or 11, wherein

a bottom base is provided at a lower portion of the bottom panel, a lower portion of the atomizing core is mounted at the bottom base, a reserved space is depressingly provided at an upper portion of the bottom base, the atomizing core includes an atomizing shell, a heating body, and an E-liquid guiding body, the E-liquid inlet is disposed at the atomizing shell, and the heating body and the E-liquid guiding body are mounted at the atomizing shell, and a rubber pad is disposed at a lower portion of the atomizing shell, and a metal electrode is disposed inside the rubber pad.

13. The atomization generating device of claim 2, wherein

the leak-proof structure includes a sliding groove disposed at an upper portion of the vapor channel and a blocking member disposed on the cartridge mouthpiece, the blocking member is inserted into the sliding groove and configured to push the sliding groove to rotate around the axis, the atomization generating device further includes:

an outer shell, wherein a top panel is disposed at a top portion of the outer shell, the vapor channel is movably mounted at the top panel, a sliding groove is disposed at an upper portion of the vapor channel, the sliding groove is horizontally disposed, the sliding groove occupies a length of $1/4$ of a circumference of a circle where the vapor channel is located, a bottom panel mounted at an opening of a lower portion of the outer shell, wherein the atomizing

core is mounted at an upper portion of the bottom panel, a first E-liquid inlet is disposed at a side wall of the atomizing core, a second E-liquid inlet is disposed at a side wall of the vapor channel, the top panel, the outer shell, the bottom panel, the vapor channel, and the atomizing core surrounding form the E-liquid storage tank,

the cartridge mouthpiece is independently disposed, the cartridge mouthpiece includes an inhalation channel, a blocking member is disposed inside the inhalation channel, the blocking member is inserted into the sliding groove, and the inhalation channel is connected with the vapor channel, when the atomization generating device is not in use, the first E-liquid inlet and the second E-liquid inlet are interposingly disposed, and when the atomization generating device is in use, the blocking member is idle-rotated for 90 degrees in the sliding groove, and the vapor channel does not rotate, the blocking member pushes the sliding groove to rotate, causing the vapor channel and the cartridge mouthpiece to rotate together for 90 degrees around the axis, and resulting in the cartridge mouthpiece to rotate for 180 degrees in a horizontal plane in accumulation, and the first E-liquid inlet is connected with the second E-liquid inlet.

14. The atomization generating device of claim 13, wherein

a snap-fitting groove is depressingly disposed downwardly from the top panel, the vapor channel is rotatably inserted into the snap-fitting groove, the sliding groove of the vapor channel is exposed at the snap-fitting groove, a trough is downwardly disposed from an upper surface of the vapor channel, the trough is connected with the sliding groove, and the trough is located at an end of the sliding groove, and the blocking member is located at a middle position of the inhalation channel, and gaps exist between the blocking member and two ends of the inhalation channel.

15. The atomization generating device of claim 13 or 14, wherein

a partition panel is disposed inside the outer shell, the partition panel is located between the bottom panel and the top panel, the partition panel includes a fixing hole for fixing the atomizing core, the first E-liquid inlet is located above the partition panel, the partition panel, the bottom panel, and the outer shell form a reversed E-liquid storage tank, a first air intake channel is disposed at a side wall of the outer shell below the partition panel, and a second air intake channel is disposed at the atom-

izing core, the second air intake channel is located below the partition panel, the second air intake channel extends first inwardly then upwardly, and the second air intake channel is connected with the vapor channel.

5

10

15

20

25

30

35

40

45

50

55

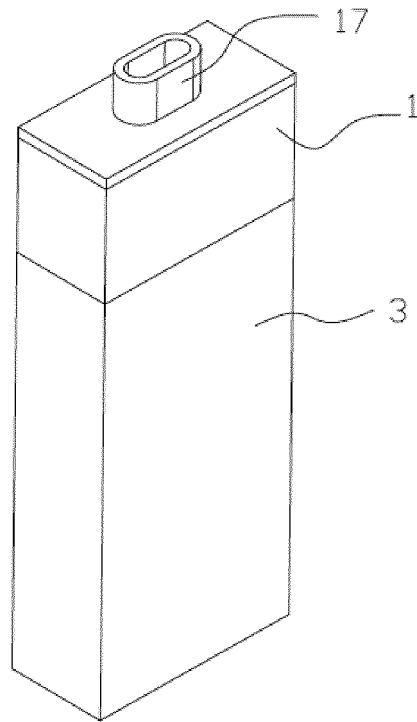


FIG. 1

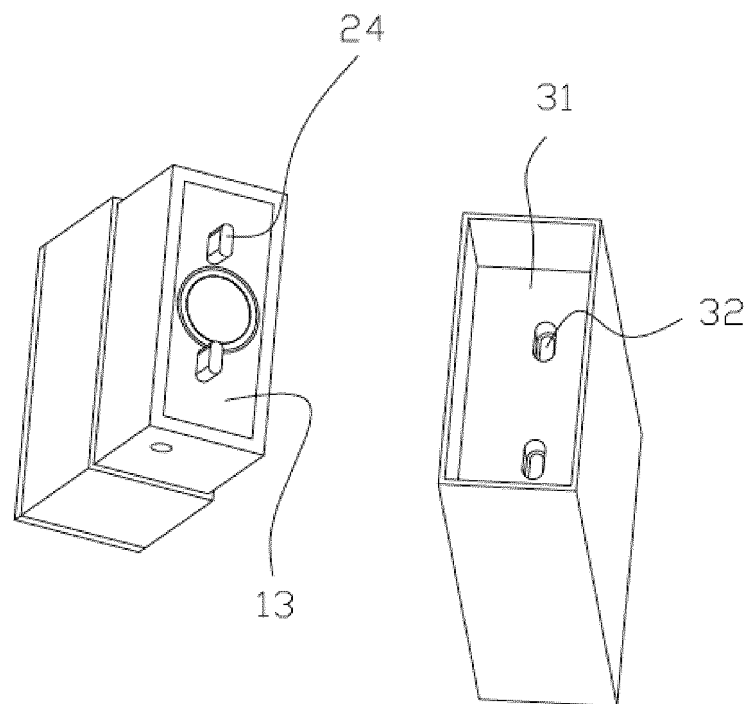


FIG. 2

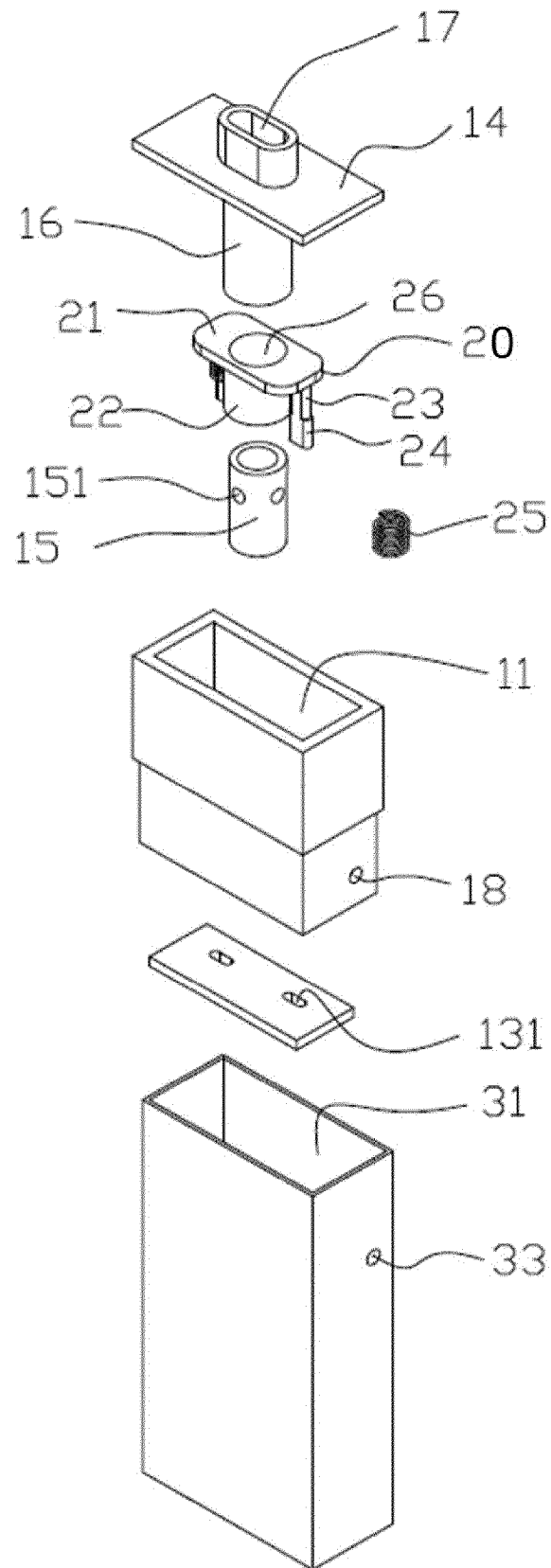


FIG. 3

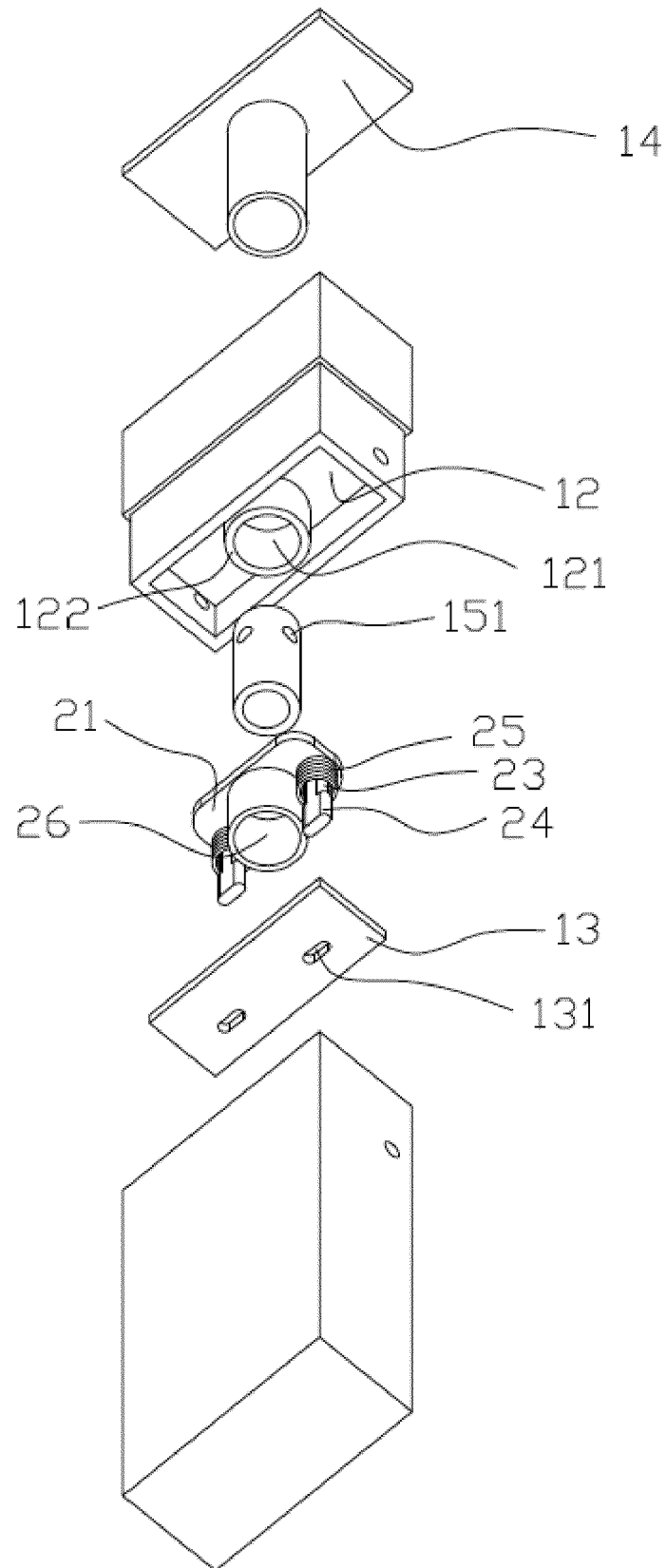


FIG. 4

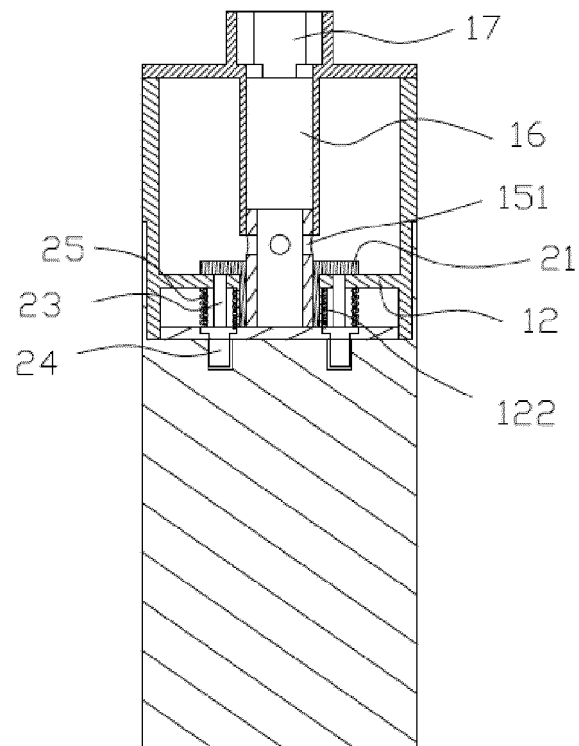


FIG. 5

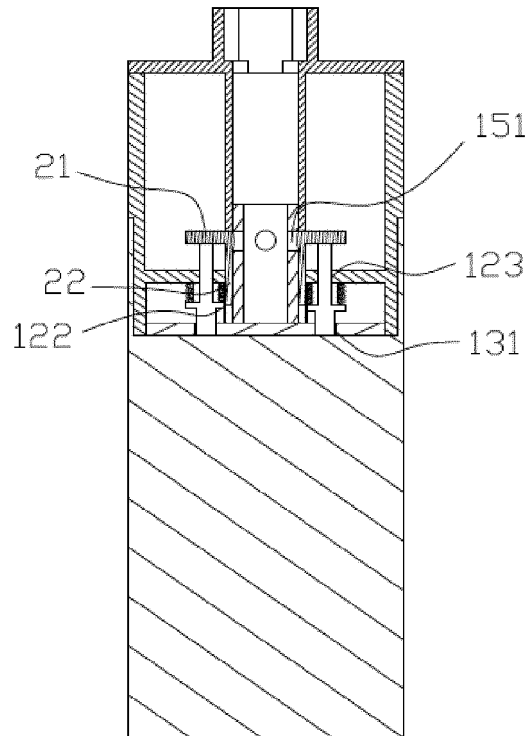


FIG. 6

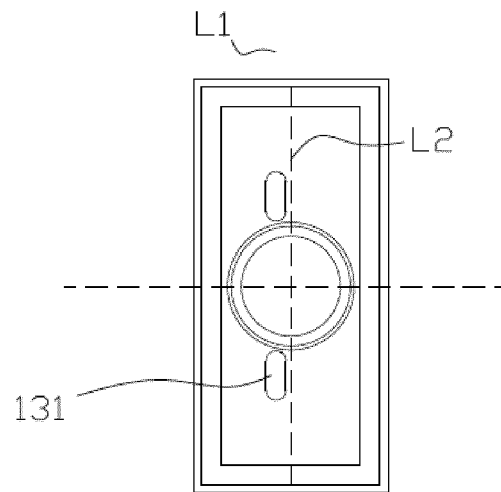


FIG. 7

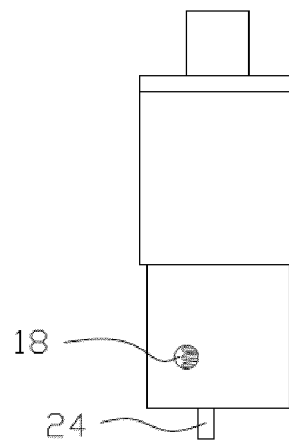


FIG. 8

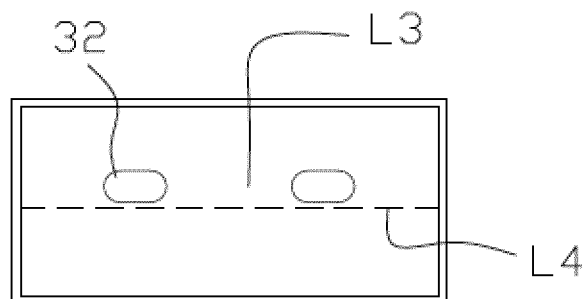


FIG. 9

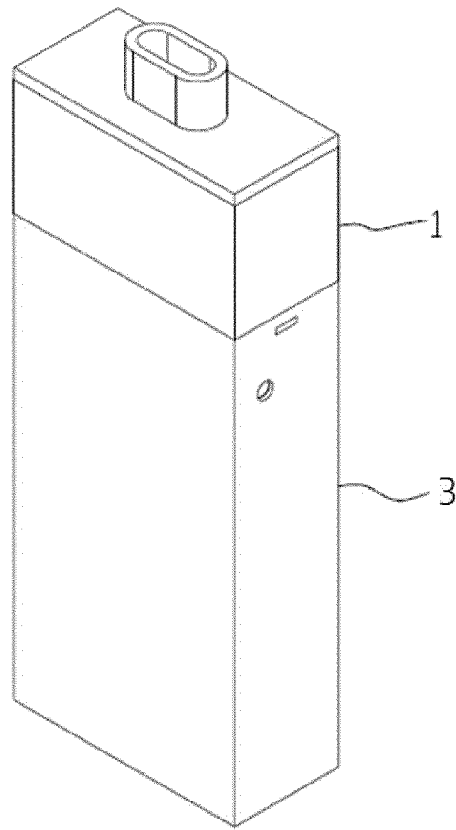


FIG. 10

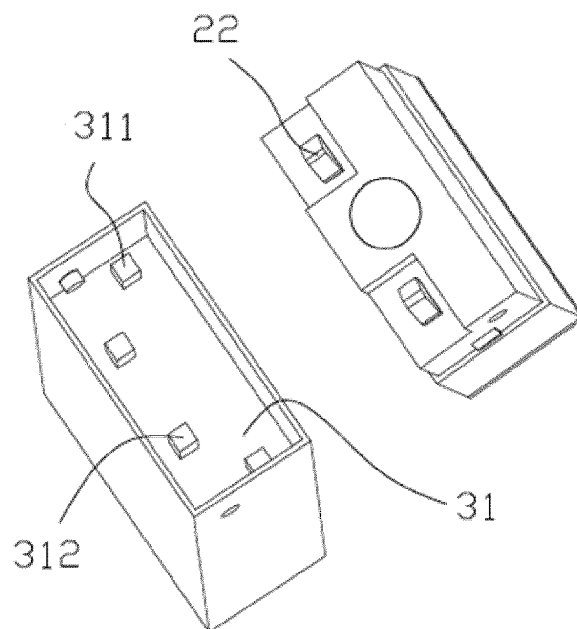


FIG. 11

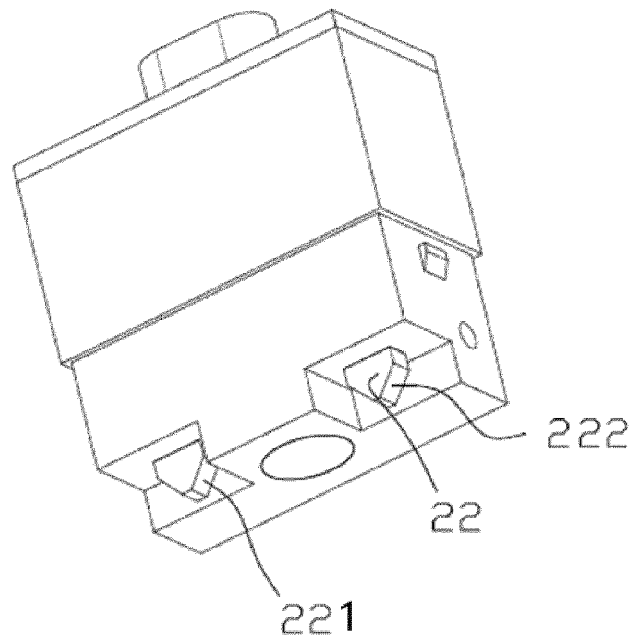


FIG. 12

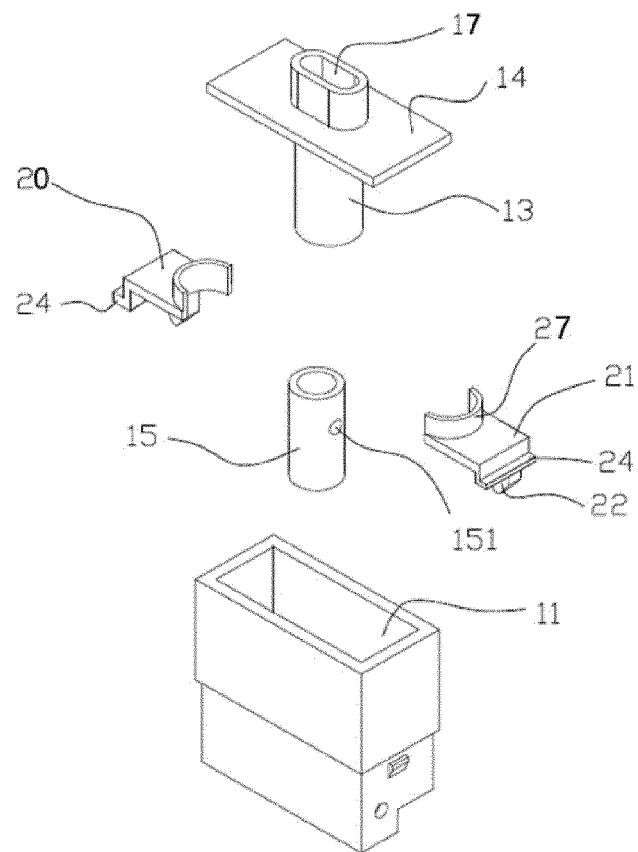


FIG. 13

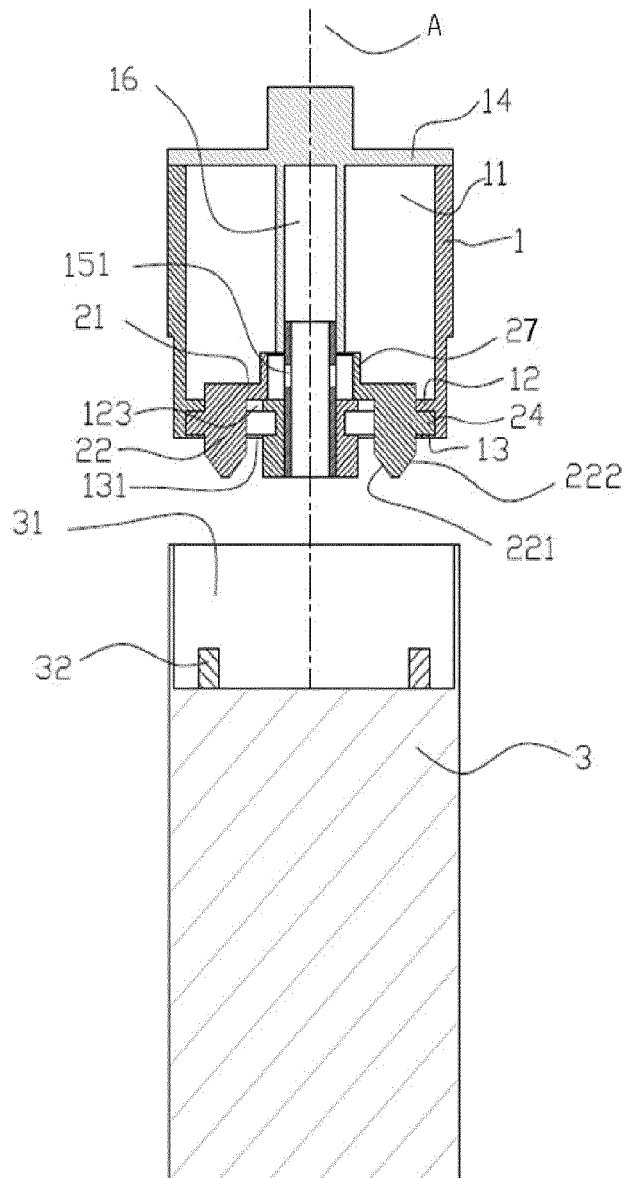


FIG. 14

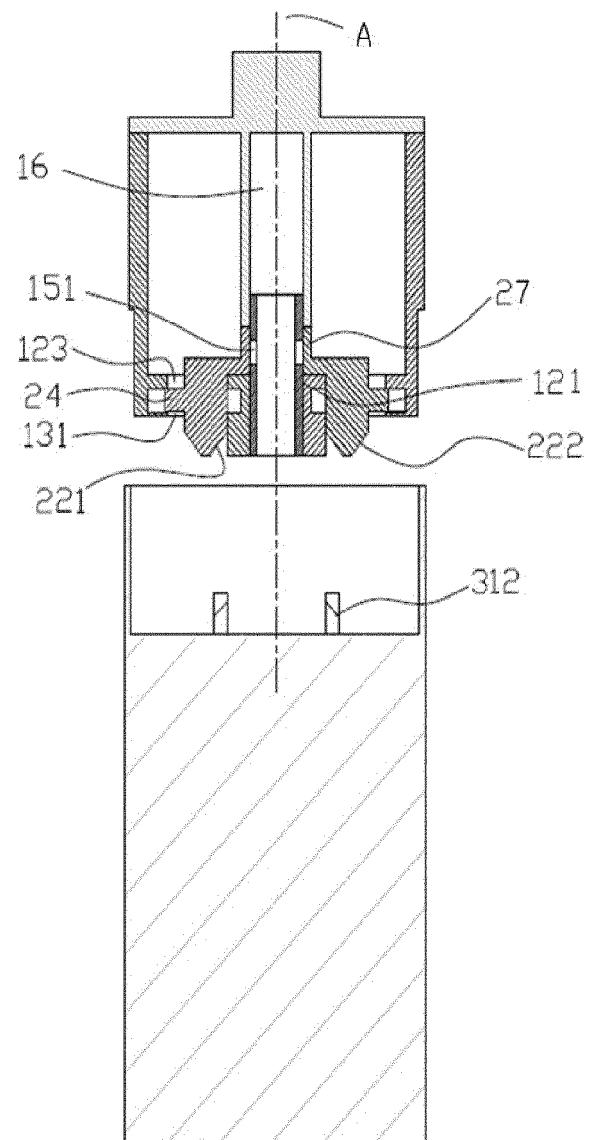


FIG. 15

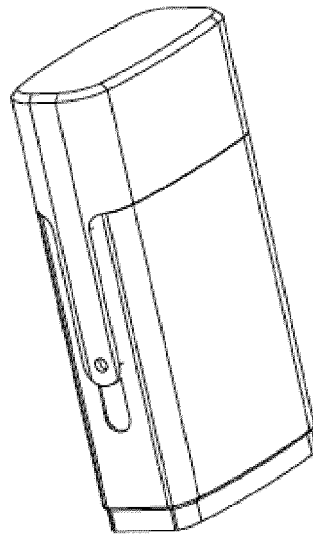


FIG. 16

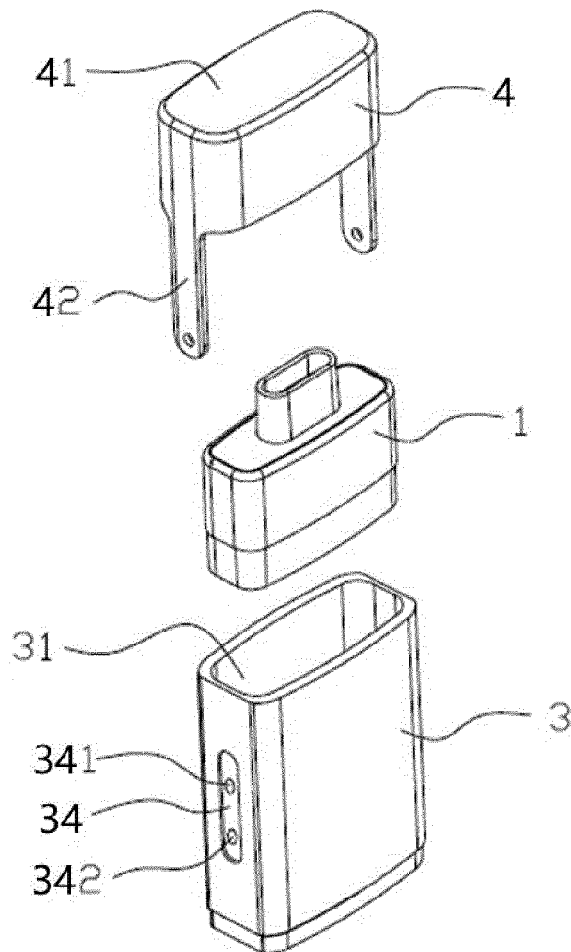


FIG. 17

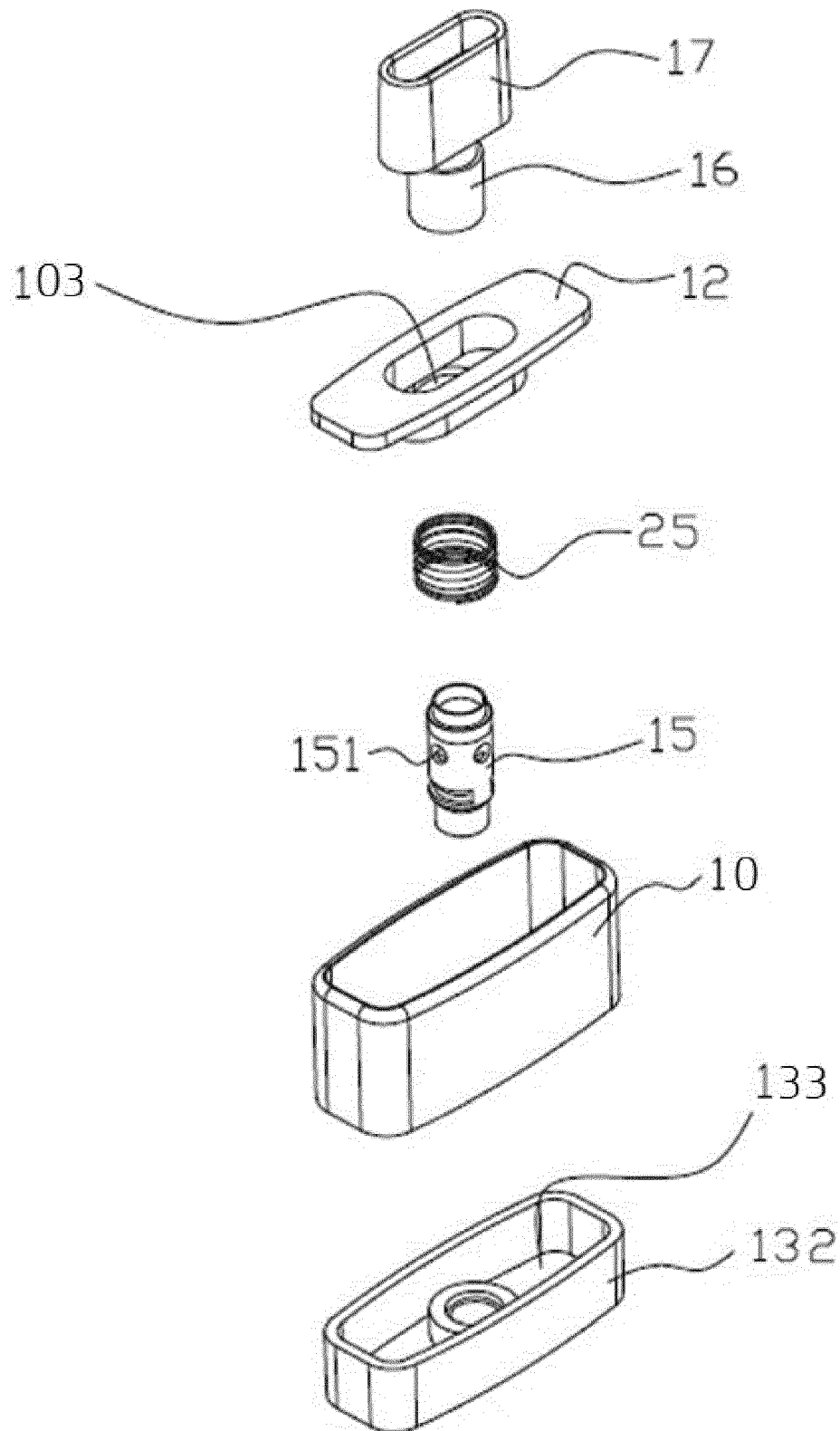


FIG. 18

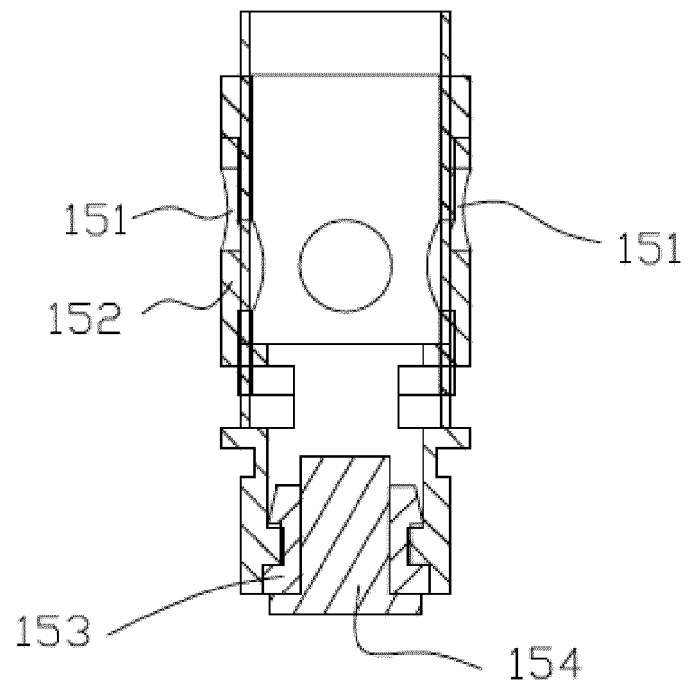


FIG. 19

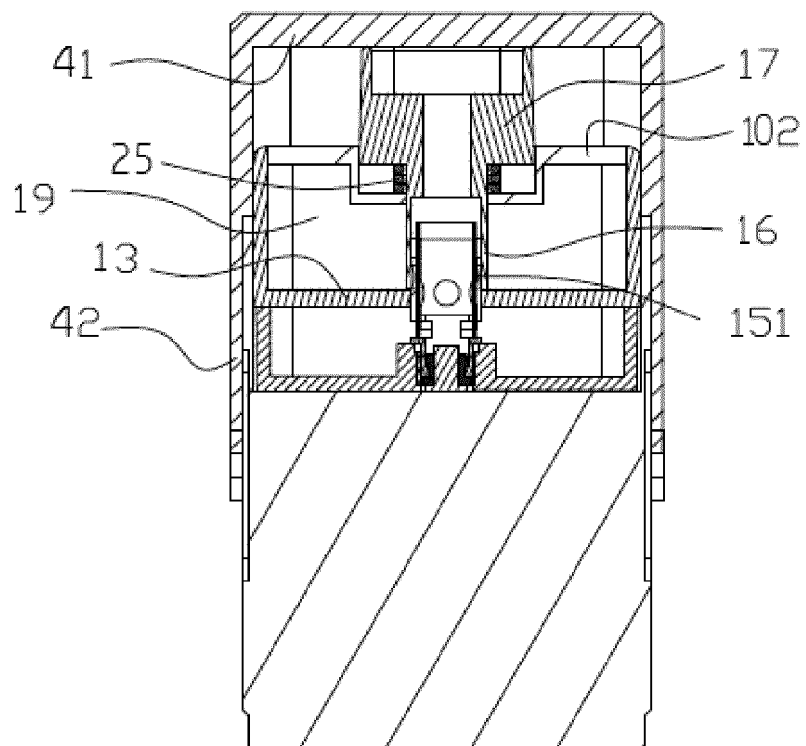


FIG. 20

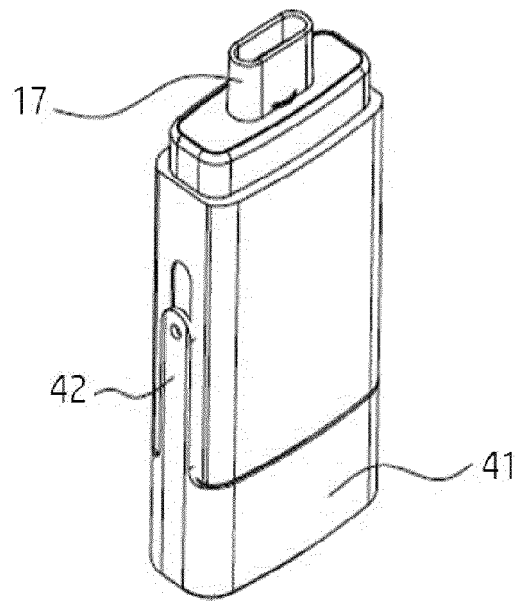


FIG. 21

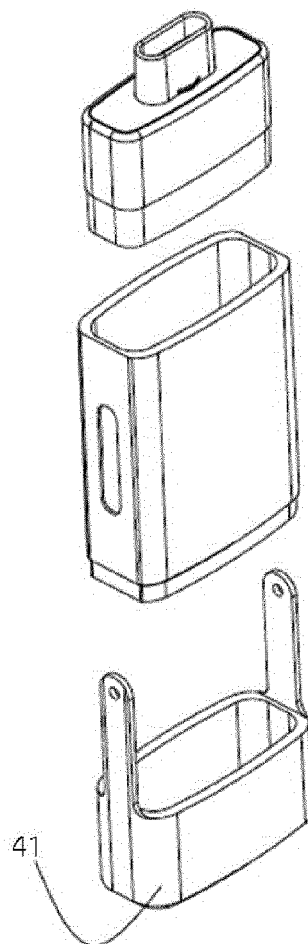


FIG. 22

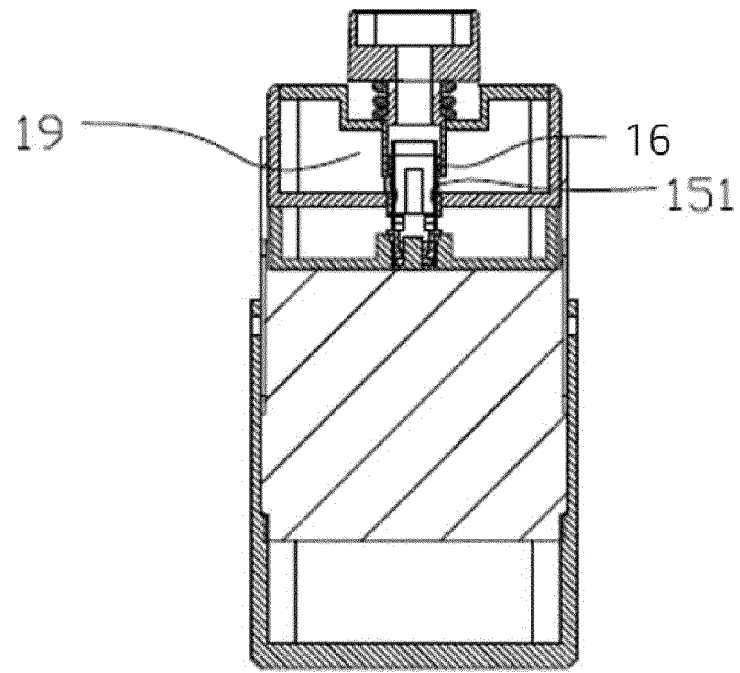


FIG. 23

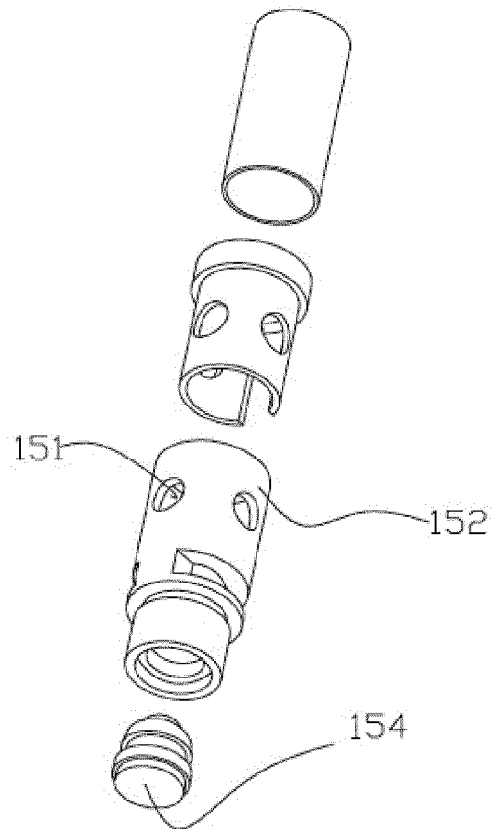


FIG. 24

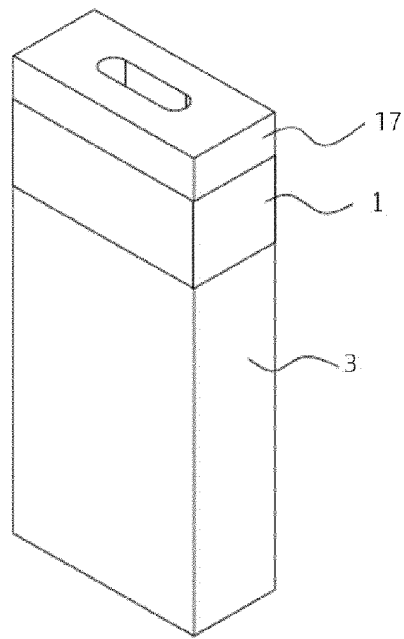


FIG. 25

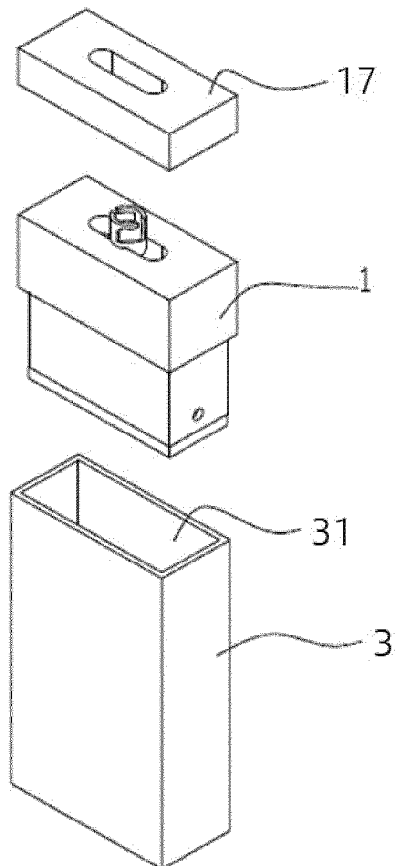


FIG. 26

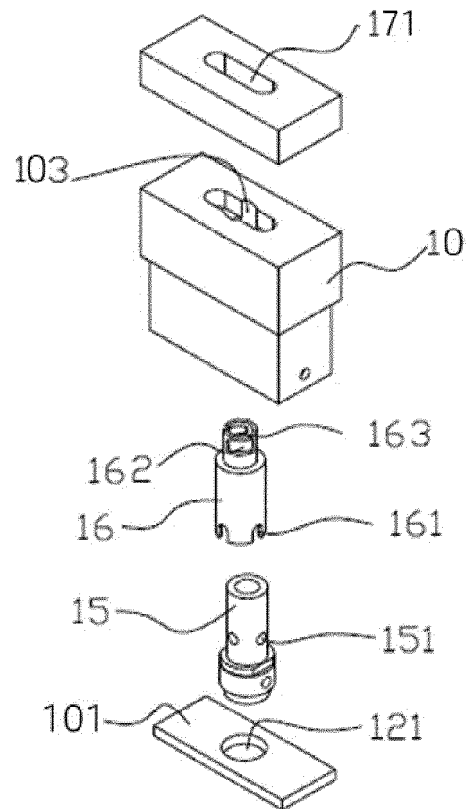


FIG. 27

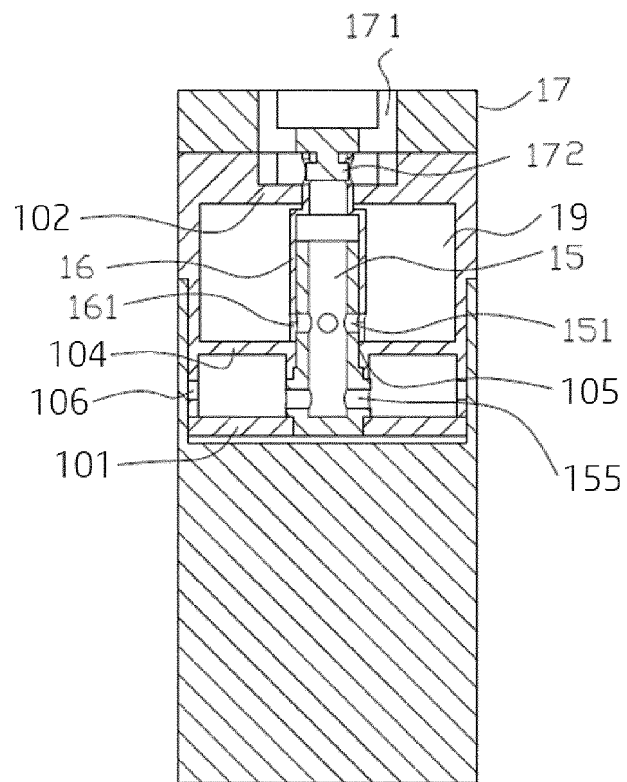


FIG. 28



EUROPEAN SEARCH REPORT

 Application Number
 EP 20 17 0262

5

10

15

20

25

30

35

40

45

50

55

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	CN 108 323 814 A (CHANGZHOU PAITENG ELECTRONIC TECH SERVICE CO LTD) 27 July 2018 (2018-07-27)	1-3	INV. A24F40/10 A24F40/40 A24F40/42
A	* figures 1-6 * * figures 14,15 *	4-15	
X	WO 2017/093452 A1 (JT INT SA) 8 June 2017 (2017-06-08)	1-3	
A	* page 2, line 10 - page 3, line 16; figures 1-4 * * page 3, line 27 - page 4, line 5 * * page 10, line 14 - page 11, line 23 *	4-15	
X	CN 108 567 166 A (SHENZHEN KANGER TECH CO LTD) 25 September 2018 (2018-09-25)	1-3	
A	* figures 6A, 6B *	4-15	
			TECHNICAL FIELDS SEARCHED (IPC)
			A24F
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 9 September 2020	Examiner Caballero Martínez
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			

EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 20 17 0262

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

09-09-2020

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
CN 108323814 A	27-07-2018	CN 108323814 A	27-07-2018
		WO 2018133267 A1	26-07-2018
-----	-----	-----	-----
15 WO 2017093452 A1	08-06-2017	CN 108430243 A	21-08-2018
		EA 201891275 A1	31-10-2018
		EP 3383207 A1	10-10-2018
		JP 2019503667 A	14-02-2019
		US 2020146351 A1	14-05-2020
		WO 2017093452 A1	08-06-2017
-----	-----	-----	-----
20 CN 108567166 A	25-09-2018	CN 108567166 A	25-09-2018
		US 9907341 B1	06-03-2018
-----	-----	-----	-----
25			
30			
35			
40			
45			
50			
55			

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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

Patent documents cited in the description

- CN 201920546310 [0001]
- CN 201920623220 [0001]
- CN 201920631424 [0001]
- CN 201920647289 [0001]