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(54) **ELECTRONIC CIGARETTE ATOMIZER FOR SOLID E-LIQUID**

(57) An electronic cigarette vaporizer for using solid e-cigarette oil comprises an upper member (100) and a lower member (200) connected with each other. The upper member (100) comprises a mouthpiece housing (1), a mouthpiece base (2), and a spring-force push rod mechanism (3) connected below the mouthpiece base (2). The spring-force push rod mechanism (3) comprises a spring (31), a push rod (32), and a push rod head (33) connected to the bottom of the push rod (32). The lower member (200) comprises an outer tube (4), an inner tube (5) disposed inside the outer tube (4), a porous vaporizing core (6) disposed inside the inner tube (5), and a connecting member (7) connected to the bottom of the outer tube (4). The gap between the outer tube (4) and the inner tube (5) defines a vapor discharge passage (45). The push rod head (33) protrudes into the inner tube (5). An oil storage chamber (50) for accommodation of the solid e-cigarette oil is defined inside the inner tube (5) between the push rod head (33) and the porous vaporizing core (6). The push rod (32) is arranged to push the solid e-cigarette oil to abut against the upper portion of the porous vaporizing core (6) under the elastic force of the spring (31). It has advantages in that, the electronic cigarette vaporizer provided with the spring-force push

rod mechanism (3) can prevent poor vaporization and dry burning. Furthermore, it uses the porous vaporizing core (6) to avoid leakage of the e-cigarette oil.

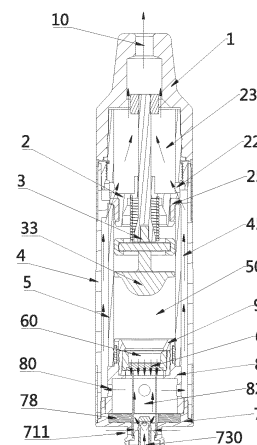


FIG.9

Description

TECHNICAL FIELD

[0001] The disclosure relates to the technical field of electronic cigarette vaporizers, and more particularly, the disclosure relates to an electronic cigarette vaporizer for using solid e-cigarette oil.

BACKGROUND

[0002] An electronic cigarette generally includes a battery part and a vaporizer which are connected with each other. The battery part is mounted with a battery for supplying power to the vaporizer. Usually, the vaporizer of the electronic cigarette comprises a heating element for atomizing the e-cigarette oil in the liquid state into e-cigarette vapor or aerosol for users to vape during operation. As the e-cigarette oil in the liquid state is prone to leakage during transportation, storage, and use, e-cigarettes which can use paste-like solid e-cigarette oil have gradually emerged in the market.

[0003] The structure of an electronic cigarette vaporizer for using solid e-cigarette oil in the market usually employs a heating element in a type of a heating plate, wherein the vaporizing chamber and the oil storage chamber of the heating element are the same one. In other words, the vapor produced by heating the solid e-cigarette oil is discharged through the oil storage chamber. In such a case, excess e-cigarette oil melted during high-temperature vaporization is prone to leakage from the vapor exhaust port. Another method is known in the market, which uses heating wires to directly heat the solid e-cigarette oil. However, according to this method, the heating wires heat and melt the solid e-cigarette oil into liquid e-cigarette oil which is prone to leakage too. Besides, after a period of use of the solid e-cigarette oil within the oil storage chamber, the side of the solid e-cigarette oil in contact with the heating wires will be consumed and thus the solid e-cigarette oil will gradually lose contact with the heating wires in the absence of external force. Consequently, poor vaporization and dry burning may occur.

SUMMARY

Technical problems

[0004] An objective of the disclosure is to overcome the abovementioned disadvantages and provide an electronic cigarette vaporizer for using solid e-cigarette oil.

Technical solutions

[0005] A technical solution of the disclosure is provided as follows. An electronic cigarette vaporizer for using solid e-cigarette oil comprises an upper member and a lower member connected with each other. The upper

member comprises a mouthpiece housing, a mouthpiece base disposed in the mouthpiece housing, and a spring-force push rod mechanism connected below the mouthpiece base, the spring-force push rod mechanism comprises a spring, a push rod, and a push rod head connected at a bottom portion of the push rod. The lower member comprises an outer tube, an inner tube disposed inside the outer tube, a porous vaporizing core disposed inside the inner tube, and a connecting member connected at a bottom end of the outer tube. A gap defined between the outer tube and the inner tube forms a vapor discharge passage, the push rod head protrudes into the inner tube, such that an oil storage chamber for accommodation of the solid e-cigarette oil is defined inside the inner tube, between the push rod head and the porous vaporizing core. The push rod is arranged to push the solid e-cigarette oil to abut against an upper portion of the porous vaporizing core under an elastic force of the spring.

[0006] Preferably, the push rod head may have I-shaped structure comprising a connecting head, an upper transverse plate, and a lower transverse plate, wherein the connecting head is connected with the push rod, and the upper transverse plate is provided with a vertical pressure relief through-hole.

[0007] Preferably, an outer wall of an upper portion of the mouthpiece base may be fitted on an inner wall of a lower portion of the mouthpiece housing, an outer wall of a middle portion of the mouthpiece base may be connected with an upper portion of the outer tube, and an outer wall of a lower portion of the mouthpiece base may be fitted on an inner wall of an upper portion of the inner tube.

[0008] Preferably, the mouthpiece base may have a hollow structure with a transverse partition plate formed inside the mouthpiece base, the transverse partition plate may be centrally provided with a sleeve hole, in which the push rod is fitted, and the spring may be fitted outside the push rod and located between the push rod head and the transverse partition plate.

[0009] Preferably, the lower member may further comprise a vaporizing base mounted on the connecting member, an upper portion of the vaporizing base may be fitted on an inner wall of a lower portion of the inner tube, and a first sealing sleeve may be disposed at a joint between the vaporizing base and the inner tube.

[0010] Preferably, the upper portion of the vaporizing base may be provided with a vaporizing core cavity, and a lower portion may be provided with a vaporizing chamber, the porous vaporizing core may be disposed in the vaporizing core cavity, a second sealing sleeve may be disposed between the porous vaporizing core and the vaporizing core cavity, a bottom portion of the porous vaporizing core may be exposed downwards to the vaporizing chamber, and a lower wall portion of the vaporizing base may be provided with a first vapor outlet hole which communicates the vaporizing chamber with the vapor discharge passage.

[0011] Preferably, an upper end of the porous vaporizing core may be further connected with an oil guiding ring, an inner wall of the oil guiding ring may define an inclined surface extending downwards and inwards.

[0012] Preferably, the porous vaporizing core may comprise a porous body, a heating resistor, and electrode leads, wherein the porous body has an upper portion provided with an oil guiding groove and a bottom portion arranged with the heating resistor, and two ends of the heating resistor are connected with the electrode leads, respectively.

[0013] Preferably, the connecting member may comprise a negative base, an insulating ring, and a positive pole, wherein an outer wall of an upper portion of the negative base is fitted on an inner wall of a bottom end of the outer tube, an outer wall of a lower portion of the negative base has an outer diameter which tapers, to form a step together with an outer wall of the upper portion, the negative base is centrally provided with a base through-hole, in which the positive pole is disposed, and the insulating ring is fitted between the base through-hole and the positive pole.

[0014] Preferably, an upper portion of the negative base may have a cavity structure, in which an oil-absorbing ring is disposed.

Advantages

[0015] The electronic cigarette vaporizer which is provided with the spring-force push rod mechanism for elastically pushing the solid e-cigarette oil towards the surface of the vaporizing core, can ensure continuous contact between the solid e-cigarette oil and the vaporizing core during use and thus can prevent poor vaporization and dry burning. Besides, the electronic cigarette vaporizer utilizes the porous vaporizing core which separates the oil storage chamber from the vaporizing chamber to heat and vaporize. It can effectively heat the solid e-cigarette oil and conduct the melted and permeated liquid e-cigarette oil, to facilitate high-efficient vaporization. Thus, it can avoid leakage caused by using the same chamber as both the oil storage chamber and the vaporizing chamber, and can prevent dripping leakage of the e-cigarette oil resulting from the direct contact between the solid e-cigarette oil and the heating resistor.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016]

FIG.1 is a front view of an electronic cigarette vaporizer for using solid e-cigarette oil of the disclosure;
FIG.2 is a cross-sectional view of an upper member of an electronic cigarette vaporizer for using solid e-cigarette oil of the disclosure;
FIG.3 is an exploded perspective view of an upper member of an electronic cigarette vaporizer for using solid e-cigarette oil of the disclosure;

FIG.4 is a cross-sectional view of a mouthpiece base of an electronic cigarette vaporizer for using solid e-cigarette oil of the disclosure;

FIG.5 is a cross-sectional view of a push rod head of an electronic cigarette vaporizer for using solid e-cigarette oil of the disclosure;

FIG.6 is a cross-sectional view of a lower member of an electronic cigarette vaporizer for using solid e-cigarette oil of the disclosure;

FIG.7 is an exploded perspective view of a lower member of an electronic cigarette vaporizer for using solid e-cigarette oil of the disclosure;

FIG.8 is a cross-sectional view of a vaporizing base of an electronic cigarette vaporizer for using solid e-cigarette oil of the disclosure;

FIG.9 is a cross-sectional view of an electronic cigarette vaporizer for using solid e-cigarette oil of the disclosure;

FIG.10 is a cross-sectional view of an oil guiding ring of an electronic cigarette vaporizer for using solid e-cigarette oil of the disclosure;

FIG.11 is a perspective view of a porous vaporizing core of an electronic cigarette vaporizer for using solid e-cigarette oil of the disclosure;

FIG.12 is a bottom view of a porous vaporizing core of an electronic cigarette vaporizer for using solid e-cigarette oil of the disclosure;

FIG.13 is a cross-sectional view of a connecting member of an electronic cigarette vaporizer for using solid e-cigarette oil of the disclosure;

FIG.14 is a perspective view of a negative base of an electronic cigarette vaporizer for using solid e-cigarette oil of the disclosure.

35 PREFERRED EMBODIMENTS OF THE INVENTION

[0017] To make the purposes, technical solutions and advantages of the invention clear, the invention is described in detail below with reference to accompanying drawings and embodiments.

[0018] For convenience of description, the electronic cigarette vaporizer for using solid e-cigarette oil of the disclosure is vertically disposed to faces upwards, which means that the vaporizer is disposed in a manner that the mouthpiece opening vertically faces upwards. The terms, such as "upper", "middle", "lower", "upper portion", "middle portion", "lower portion", "upper end", "lower end", "upwards", "downwards" as used herein for illustrating the components, refer to position and orientation relationships when the mouthpiece opening of the electronic cigarette vaporizer vertically faces upwards.

Embodiments of the disclosure

[0019] The disclosure will be further explained in detail with reference to particular embodiments.

Embodiments

[0020] Referring to FIGs.1-2, the electronic cigarette vaporizer for using solid e-cigarette oil of the disclosure consists of an upper member 100 and a lower member 200 connected with each other. The upper member 100 is formed by connecting a mouthpiece housing 1, a mouthpiece base 2 disposed in the mouthpiece housing, and a spring-force push rod mechanism 3 connected below the mouthpiece base. The mouthpiece housing 1 has a hollow structure with a relatively smaller upper portion and a relatively larger lower portion, and the top end of the mouthpiece housing 1 is provided with a mouthpiece opening 10. The lower member 200 consists of an outer tube 4, an inner tube 5 disposed inside the outer tube 4, a porous vaporizing core 6 disposed inside the inner tube, a connecting member 7 connected at the bottom end of the outer tube, and a first decorative sleeve 41 and a second decorative sleeve 42 both fitted on the outer walls of the top and bottom ends of the outer tube 4, respectively. A gap is defined between the outer tube 4 and the inner tube 5, to form a vapor discharge passage 45. A threaded connecting sleeve 40 is further fitted on the inner wall of the upper end of the outer tube 4, and the inner wall of the threaded connecting sleeve 40 is provided with internal threads for connecting with external threads provided on the outer wall of the mouthpiece base 2.

[0021] Referring to FIGs.2-3, the spring-force push rod mechanism 3 consists of a spring 31, a push rod 32, and a push rod head 33 connected at the bottom portion of the push rod. A retaining ring 34 is further fitted on the top end of the push rod 32, to stop the push rod 32 from sliding down beyond its terminal position.

[0022] Referring to FIGs.2-4, the upper portion of the mouthpiece base 2 is fitted on the inner wall of the lower portion of the mouthpiece housing 1, the outer wall of the middle portion of the mouthpiece base 2 is connected with the inner wall of the upper portion of the outer tube 4, and the outer wall of the lower portion of the mouthpiece base 2 is fitted on the inner wall of the upper portion of the inner tube 5. The mouthpiece base 2 has a hollow structure with a transverse partition plate 21 formed inside. The transverse partition plate 21 is centrally provided with a sleeve hole 20, in which the push rod 32 is fitted. The spring 31 is fitted outside the push rod 32 and positioned between the push rod head 33 and the transverse partition plate 21. The wall portion of the mouthpiece base 2 above the transverse partition plate 21 is provided with a second vapor outlet hole 22 extending transversely. The portion of the mouthpiece base 2 above the transverse partition plate 21 and the inner wall of the mouthpiece housing 1 define a vapor cavity 23, and the second vapor outlet hole 22 communicates the vapor discharge passage 45 with the vapor cavity 23.

[0023] Referring to FIG.5, the push rod head 33 is designed in an I-shaped structure consisting of a connecting head 331, an upper transverse plate 332, and a lower transverse plate 333. The connecting head 331 is

connected with the push rod 32, and the upper transverse plate 332 is provided with a vertical pressure relief through-hole 3320 for allowing the air inside the oil storage chamber 50 to escape upwards when the solid e-cigarette oil is pressed by the push rod head 33. The bottom portion of the lower transverse plate 333 is designed in a pot-bottom shape to fit with the oil guiding groove 60 of the porous vaporizing core 6, thereby facilitating pushing the solid e-cigarette oil into the oil guiding groove 60 to the utmost extent to achieve the maximum consumption of the solid e-cigarette oil. Furthermore, a layer of fourth sealing sleeve 334 wraps the outside of the upper transverse plate 332 to seal the gap between the upper transverse plate 332 and the inner tube 5, thereby preventing upward leakage of solid e-cigarette oil when it is being pressed.

[0024] Referring to FIGs.6-8, the lower member 200 further comprises a vaporizing base 8. The lower portion of the vaporizing base 8 is mounted on the connecting member 7, and its upper portion is fitted on the inner wall of the lower portion of the inner tube 5. A first sealing sleeve 85 is disposed at the joint between the vaporizing base 8 and the inner tube 5, to seal the gap therebetween and prevent oil leakage. The upper portion of the vaporizing base 8 is provided with a vaporizing core cavity 81, and the lower portion of the vaporizing base 8 is provided with a vaporizing chamber 82. The porous vaporizing core 6 is disposed within the vaporizing core cavity 81, and a second sealing sleeve 86 is disposed between the porous vaporizing core 6 and the vaporizing core cavity 81. The bottom portion of the porous vaporizing core 6 is exposed downwards to the vaporizing chamber 82. The lower wall portion of the vaporizing base 8 is provided with a first vapor outlet hole 80, which communicates the vaporizing chamber 82 with the vapor discharge passage 45. An oil-absorbing ring 78 is disposed within the cavity of the upper portion of the connecting member 7 below the vaporizing base 8. The oil-absorbing ring 78 is made of oil-absorbing material such as cotton material, to collect and absorb the dripped e-cigarette oil that is unvaporized during the vaporization of the porous vaporizing core 6, thereby preventing the unvaporized e-cigarette oil droplets from being inhaled by the user.

[0025] Referring to FIG.9, the outer wall of the lower portion of the mouthpiece base 2 is fitted on the inner wall of the upper portion of the inner tube 5. A third sealing sleeve 25 is provided between the mouthpiece base 2 and the inner tube 5, to seal the gap therebetween and prevent air or oil leakage. The push rod head 33 of the spring-force push rod mechanism 3 protrudes into the inner tube 5. An oil storage chamber 50 for accommodation of the solid e-cigarette oil is located between the push rod head 33 extending in the inner tube 5, and the porous vaporizing core 6. Under the elastic force of the spring 31, the push rod 32 pushes the solid e-cigarette oil to abut against the porous vaporizing core 6. All sealing sleeves mentioned in the disclosure can be made of silicone material. The sealing sleeves made of silicone material

possess excellent sealing performance including high temperature resistance and wear resistance.

[0026] Referring to FIGs.9-10, the upper end of the porous vaporizing core 6 is further connected with an oil guiding ring 9. The inner wall of the oil guiding ring 9 is designed to define an inclined surface 91 extending downwards and inwards. The oil guiding ring 9 can facilitate an accumulation of the solid e-cigarette oil near the tube wall of the inner tube 5 into the oil guiding groove 60 of the porous vaporizing core 6 along the inclined surface 91 under the pressure of the push rod head 33. The oil guiding ring 9 can be made of dense ceramic.

[0027] Referring to FIGs.11-12, the porous vaporizing core 6 consists of a porous body 61, a heating resistor 62, and electrode leads 63. The upper portion of the porous body 61 is provided with an oil guiding groove 60, the bottom portion is arranged with the heating resistor 62, and two ends of the heating resistor 62 are respectively connected with an electrode lead 63. The porous body 61 can be made of porous ceramic.

[0028] Referring to FIGs.13-14, the connecting member 7 comprises a negative base 71, an insulating ring 72, and a positive pole 73. The upper portion of the negative base 71 has a cavity structure for accommodation of an oil-absorbing ring 78. The outer wall of the upper portion of the negative base 71 is fitted on the inner wall of the bottom end of the outer tube 4. The outer diameter of the outer wall of the lower portion of the negative base 71 tapers to form a step together with the outer wall of the upper portion. The lower portion of the negative base 71 is centrally provided with a base through-hole 710, in which the positive pole 73 is disposed. The insulating ring 72 is fitted between the base through-hole 710 and the positive pole 73. The outer wall of the lower portion of the negative base 71 is provided with a first air inlet hole 711 in communication with the base through-hole 710. The outer wall of the lower portion of the negative base 71 is provided with external threads 712 for connection with the connecting threads of the battery part. The positive pole 73 has a hollow structure which is axially provided with a second air inlet hole 730.

[0029] Referring to FIG.9, during operation of the electronic cigarette vaporizer for using solid e-cigarette oil in the embodiment, a negative pressure, indicated by a series of upward arrows as shown in FIG.9, may be generated in the electronic cigarette vaporizer due to the suction force when a user takes a puff through the mouthpiece opening 10. Thus, external air may enter the vaporizing chamber 82 upwards from the bottom through the first air inlet hole 711 and the second air inlet hole 730. At the moment, the heating resistor 62 disposed at the bottom portion of the porous body 61 may be powered on to generate heat. The solid e-cigarette oil stored in the oil storage chamber 50 may be pressed downwards into the oil guiding groove 60 of the porous vaporizing core 6 by the push rod head 33. The heat energy may be conducted upwards from the bottom portion of the porous body 61 to the bottom portion of the oil guiding groove 60, to melt the

solid e-cigarette oil in contact with the bottom portion of the oil guiding groove 60. Then, the melted e-cigarette oil in the porous body 61 may be permeated downwards to the bottom portion of the porous body 61. The heating resistor 62 may heat the e-cigarette oil permeated to the surface of the bottom portion of the porous body 61. The e-cigarette oil may be vaporized at high temperatures, into e-cigarette vapor. Then, the e-cigarette vapor may be distributed downwards into the vaporizing chamber 82, carried by the flow of incoming external air and flow out through the first vapor outlet hole 80 into the vapor discharge passage 45. After that, the vapor may continue to flow upwards, passing through the second vapor outlet hole 22 into the vapor cavity 23 at the upper portion of the mouthpiece base 2, and finally flow through the mouthpiece opening 10 into the user's mouth.

Industrial applicability

[0030] All the above are merely preferred embodiments of the disclosure. The present invention is intended to cover all equivalent arrangements and modifications derived from the claims of the present invention.

Claims

1. An electronic cigarette vaporizer for using solid e-cigarette oil, **characterized in that** the vaporizer comprises an upper member (100) and a lower member (200) connected with each other, wherein the upper member (100) comprises a mouthpiece housing (1), a mouthpiece base (2) disposed in the mouthpiece housing (1), and a spring-force push rod mechanism (3) connected below the mouthpiece base (2), the spring-force push rod mechanism (3) comprises a spring (31), a push rod (32), and a push rod head (33) connected at a bottom portion of the push rod (32), wherein the lower member (200) comprises an outer tube (4), an inner tube (5) disposed inside the outer tube (4), a porous vaporizing core (6) disposed inside the inner tube (5), and a connecting member (7) connected at a bottom end of the outer tube (4); a gap is defined between the outer tube (4) and the inner tube (5) to form a vapor discharge passage (45), the push rod head (33) protrudes into the inner tube (5), such that an oil storage chamber (50) for accommodation of the solid e-cigarette oil is defined inside the inner tube (5), between the push rod head (33) and the porous vaporizing core (6), and the push rod (32) is arranged to push the solid e-cigarette oil to abut against an upper portion of the porous vaporizing core (6) under an elastic force of the spring (31).
2. The electronic cigarette vaporizer for using solid e-cigarette oil according to claim 1, wherein the push rod head (33) has I-shaped structure comprising a

connecting head (331), an upper transverse plate (332), and a lower transverse plate (333), wherein the connecting head (331) is connected with the push rod (332), and the upper transverse plate (332) is provided with a vertical pressure relief through-hole (3320).

3. The electronic cigarette vaporizer for using solid e-cigarette oil according to claim 1, wherein an outer wall of an upper portion of the mouthpiece base (2) is fitted on an inner wall of a lower portion of the mouthpiece housing (1), an outer wall of a middle portion of the mouthpiece base (2) is connected with an upper portion of the outer tube (4), and an outer wall of a lower portion of the mouthpiece base (2) is fitted on an inner wall of an upper portion of the inner tube (5). 10
4. The electronic cigarette vaporizer for using solid e-cigarette oil according to claim 1, wherein the mouthpiece base (2) has a hollow structure with a transverse partition plate (21) formed inside the mouthpiece base (2), the transverse partition plate (21) is centrally provided with a sleeve hole (20), in which the push rod (32) is fitted, and the spring (31) is fitted outside the push rod (32) and located between the push rod head (33) and the transverse partition plate (21). 20 25
5. The electronic cigarette vaporizer for using solid e-cigarette oil according to claim 1, wherein the lower member (200) further comprises a vaporizing base (8) mounted on the connecting member (7), an upper portion of the vaporizing base (8) is fitted on an inner wall of a lower portion of the inner tube (5), and a first sealing sleeve (85) is disposed at a joint between the vaporizing base (8) and the inner tube (5). 30 35
6. The electronic cigarette vaporizer for using solid e-cigarette oil according to claim 5, wherein the upper portion of the vaporizing base (8) is provided with a vaporizing core cavity (81), and a lower portion of the vaporizing base (8) is provided with a vaporizing chamber (82), the porous vaporizing core (6) is disposed in the vaporizing core cavity (81), a second sealing sleeve (86) is disposed between the porous vaporizing core (6) and the vaporizing core cavity (81), a bottom portion of the porous vaporizing core (6) is exposed downwards to the vaporizing chamber (82), and a lower wall portion of the vaporizing base (8) is provided with a first vapor outlet hole (80) which communicates the vaporizing chamber (82) with the vapor discharge passage (45). 40 45 50
7. The electronic cigarette vaporizer for using solid e-cigarette oil according to claim 5, wherein an upper end of the porous vaporizing core (6) is further connected with an oil guiding ring (9), an inner wall of the oil guiding ring (9) has an inclined surface (91) ex-

tending downwards and inwards.

8. The electronic cigarette vaporizer for using solid e-cigarette oil according to claim 1, wherein the porous vaporizing core (6) comprises a porous body (61), a heating resistor (62), and electrode leads (63), the porous body (61) has an upper portion provided with an oil guiding groove (60) and a bottom portion arranged with the heating resistor (62), and two ends of the heating resistor (62) are connected with the electrode leads (63), respectively. 5
9. The electronic cigarette vaporizer for using solid e-cigarette oil according to claim 1, wherein the connecting member (7) comprises a negative base (71), an insulating ring (72), and a positive pole (73), an outer wall of an upper portion of the negative base (71) is fitted on an inner wall of a bottom end of the outer tube (4), an outer wall of a lower portion of the negative base (71) has an outer diameter which tapers, to form a step together with an outer wall of the upper portion, the negative base (71) is centrally provided with a base through-hole (710), in which the positive pole (73) is disposed, and the insulating ring (72) is fitted between the base through-hole (710) and the positive pole (73). 15 20 25
10. The electronic cigarette vaporizer for using solid e-cigarette oil according to claim 9, wherein an upper portion of the negative base (71) has a cavity structure, in which an oil-absorbing ring (78) is disposed. 30 35

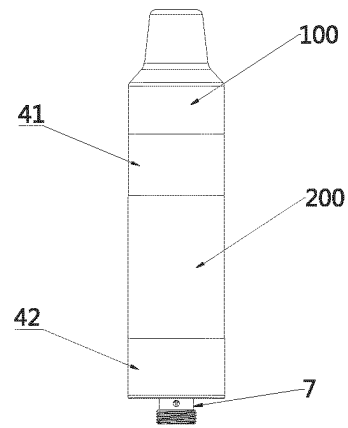


FIG.1

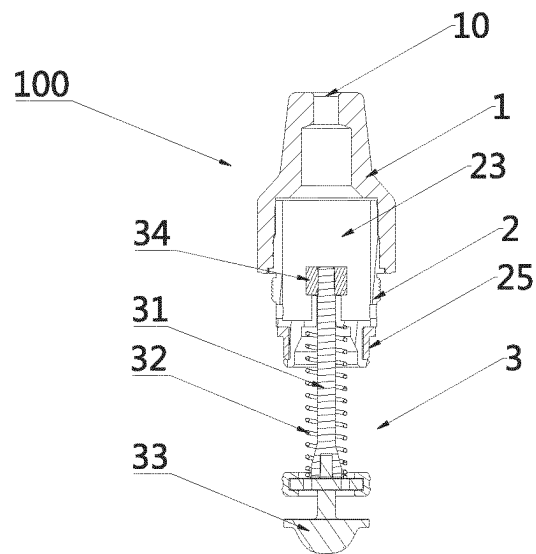


FIG.2

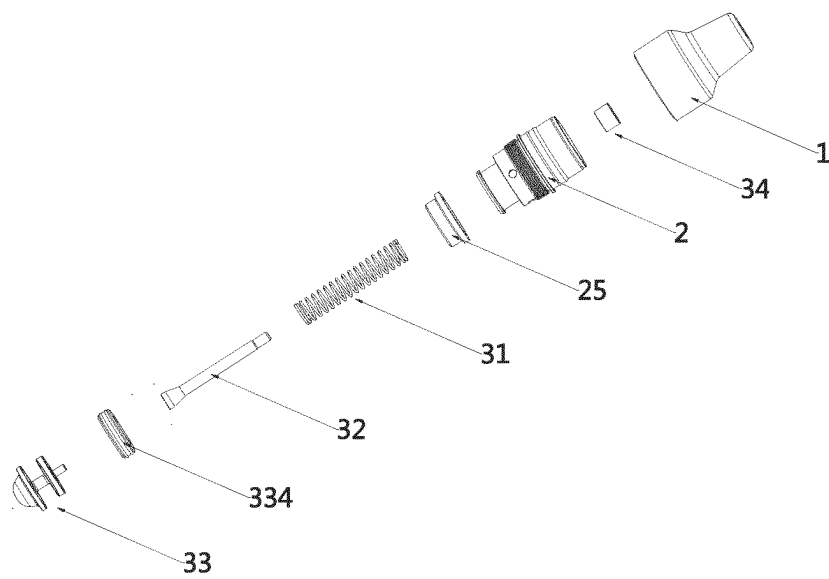


FIG.3

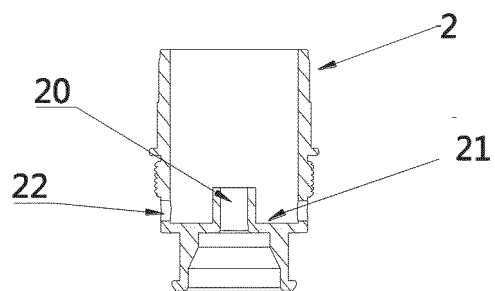


FIG. 4

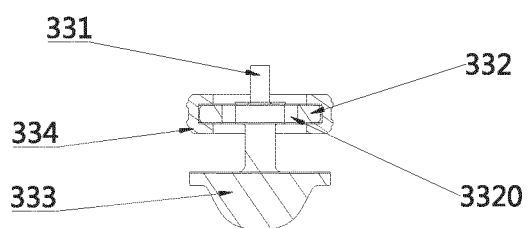


FIG. 5

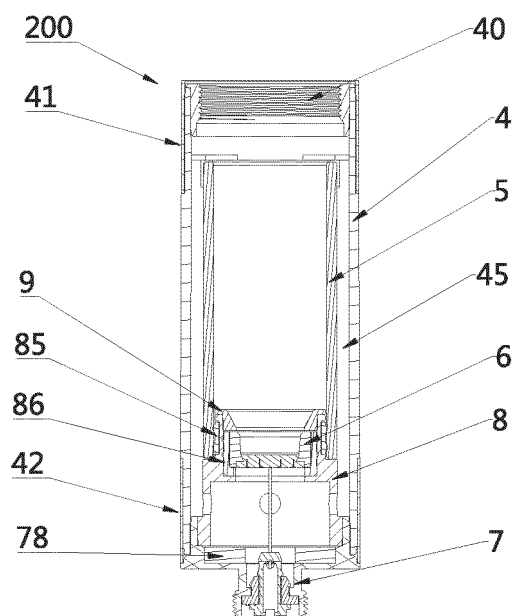


FIG. 6

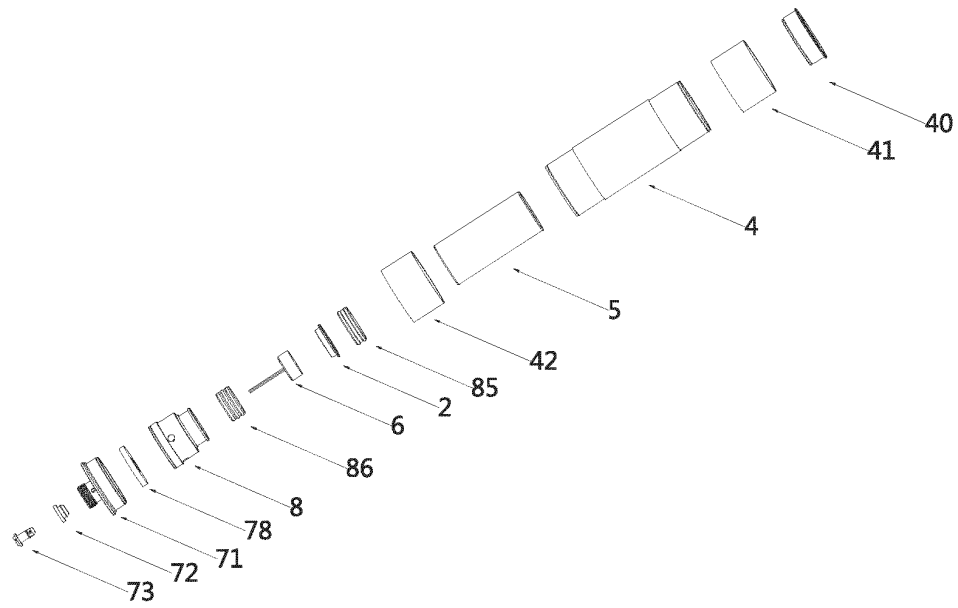


FIG.7

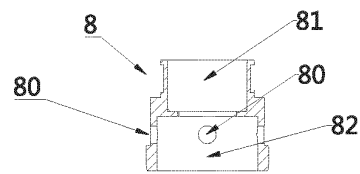


FIG.8

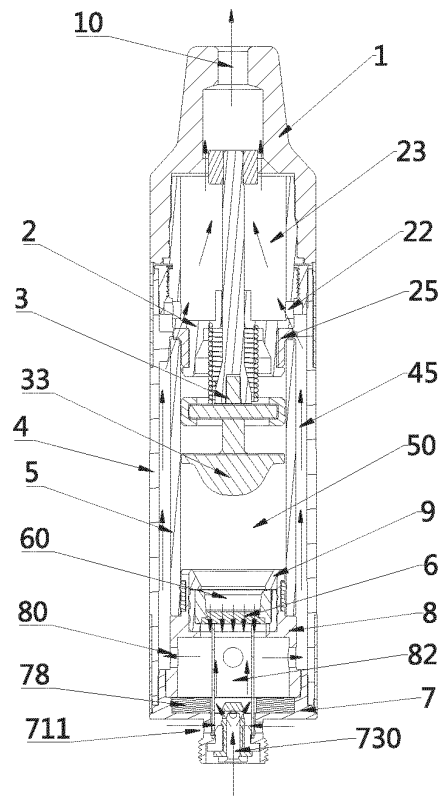


FIG.9

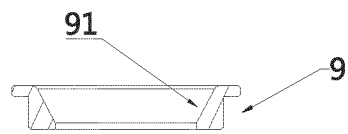


FIG. 10

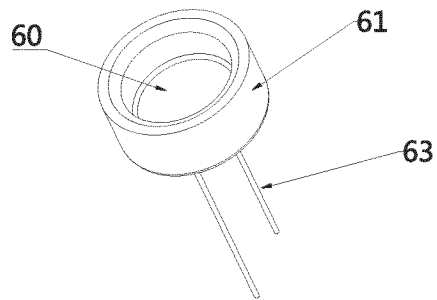


FIG. 11

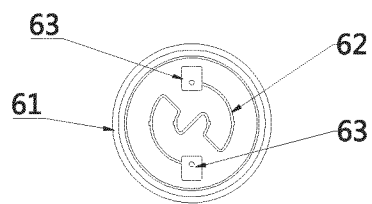


FIG. 12

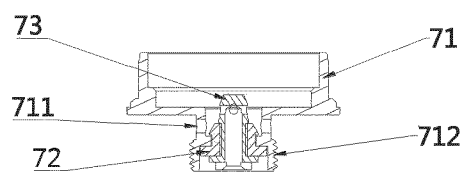


FIG. 13

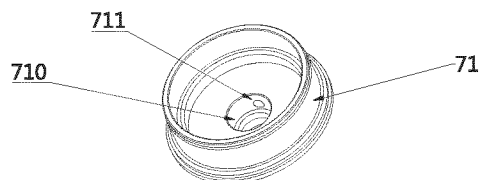


FIG. 14

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2023/107965

A. CLASSIFICATION OF SUBJECT MATTER

A24F40/20(2020.01)i; A24F40/40(2020.01)i; A24F40/46(2020.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC:A24F40

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

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

CNABS, CNTXT, VEN: 固态, 固体, 凝胶, 烟油, 烟膏, 电子烟, 雾化, 加热, 抵接, 压紧, 接触, 弹簧, 推杆, 多孔, 雾化芯, solid, tobacco, tar, heat+, push rod, spring

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 218126965 U (HUIZHOU HAPPY VAPING TECHNOLOGY LTD.) 27 December 2022 (2022-12-27) description, paragraphs 4-15	1-10
Y	CN 114947219 A (HUIZHOU HAPPY VAPING TECHNOLOGY LTD.) 30 August 2022 (2022-08-30) description, paragraphs 48-68	1-10
Y	CN 112586810 A (CHINA TOBACCO YUNNAN INDUSTRIAL CO., LTD.) 02 April 2021 (2021-04-02) description, paragraphs 10-48	1-10
A	CN 112690508 A (CHINA TOBACCO YUNNAN INDUSTRIAL CO., LTD.) 23 April 2021 (2021-04-23) entire document	1-10
A	CN 113907428 A (SHENZHEN ZINWI BIOTECHNOLOGY CO., LTD.) 11 January 2022 (2022-01-11) entire document	1-10

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

* Special categories of cited documents:

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

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

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

“L” document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

“O” document referring to an oral disclosure, use, exhibition or other means

“P” document published prior to the international filing date but later than the priority date claimed

“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

“X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

“Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

“&” document member of the same patent family

Date of the actual completion of the international search

13 November 2023

Date of mailing of the international search report

21 November 2023

Name and mailing address of the ISA/CN

China National Intellectual Property Administration (ISA/
CN)
China No. 6, Xitucheng Road, Jimenqiao, Haidian District,
Beijing 100088

Authorized officer

Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2023/107965

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 103300482 A (LIU XIANG) 18 September 2013 (2013-09-18) entire document	1-10
A	CN 112654268 A (PHILIP MORRIS PRODUCTS S.A.) 13 April 2021 (2021-04-13) entire document	1-10
A	CN 106418713 A (LIAO XIANGYANG) 22 February 2017 (2017-02-22) entire document	1-10
A	CN 114271551 A (CHINA TOBACCO YUNNAN INDUSTRIAL CO., LTD.) 05 April 2022 (2022-04-05) entire document	1-10
A	US 2019230991 A1 (CHINA TOBACCO HUNAN INDUSTRIAL CO., LTD.) 01 August 2019 (2019-08-01) entire document	1-10
A	US 2018027884 A1 (ALTRIA CLIENT SERVICES LLC.) 01 February 2018 (2018-02-01) entire document	1-10

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2023/107965

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 218126965 U	27 December 2022	None	
CN 114947219 A	30 August 2022	None	
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		WO 2018058884 A1	05 April 2018
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