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(54) Title: ELECTRONIC ATOMIZING INHALATION DEVICE

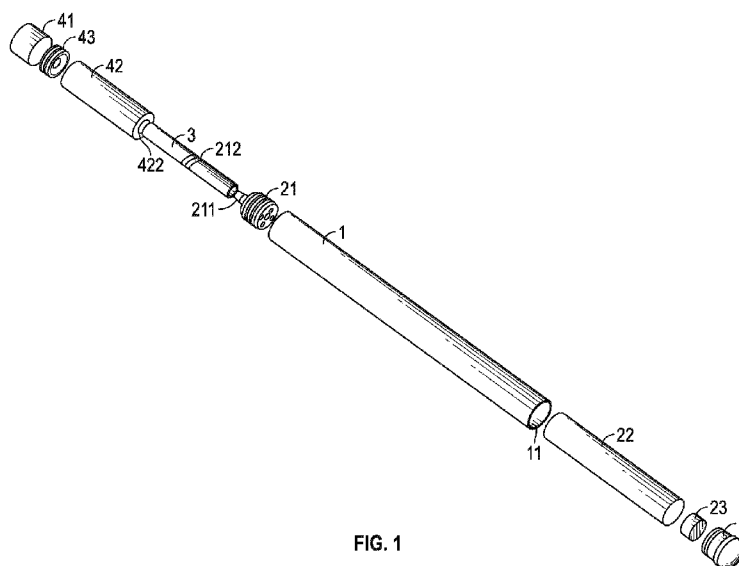


FIG. 1

(57) Abstract: An electronic atomizing inhalation device, includes: a shell (1), the shell (1) including a hollow cavity (11) which includes a hollow pipe (3); an atomizing part and a filtering part arranged in the hollow cavity (11). The atomizing part includes a heating body fixed on the hollow pipe (3), and a liquid storage part (42) wound outside the hollow pipe (3). The filtering part is sleeved on one side of the atomizing part. And the filter body (41) of the filtering part is fastened on an open end of the shell (1) through a sealing bracket (43). The electronic atomizing inhalation device can filter the harmful substances in the smoke it generates; and the electronic atomizing inhalation device is simple in structure, and is safe, reliable, attractive and original.



## Description

### Title of Invention: ELECTRONIC ATOMIZING INHALATION DEVICE

[1]       **【FIELD OF THE INVENTION】**

[2]       The present disclosure relates to the field of electronic atomizing inhalation devices, particularly relates to an electronic atomizing inhalation device having a filtering function.

[3]       **【BACKGROUND OF THE INVENTION】**

[4]       The nozzle of a conventional electronic cigarette does not have any filtering function in general, and is in communication with the inside of the electronic cigarette. When a user smokes an electronic cigarette, nicotine, nicotinamide, and tobacco tar in smoke generated inside the electronic cigarette can enter the oral cavity of the user directly via the nozzle, threatening the user's health.

[5]       Furthermore, the nozzle of the conventional electronic cigarette differs greatly from that of a cigarette nozzle in structure, affecting user experience and is aesthetically unattractive.

[6]       **【SUMMARY OF THE INVENTION】**

[7]       The present disclosure aims to provide an electronic atomizing inhalation device, which is capable of filtering harmful substances in produced smoke and lowering the probability of harmful substances harming human health; and the electronic atomizing inhalation device is simple in structure, and is safe, reliable, attractive, and original.

[8]       In order to solve the abovementioned technical problems, the embodiments of the present disclosure can provide an electronic atomizing inhalation device, including, for example:

[9]       A shell including a hollow cavity which includes a hollow pipe therein.

[10]      An atomizing part and a filtering part arranged in the hollow cavity, the atomizing part including a heating body fixed on the hollow pipe, and a liquid storage part wound outside the hollow pipe.

[11]      The filtering part can be sleeved on one side of the atomizing part; and include a filtering body fastened on an open end of the shell through a sealing bracket.

[12]      Preferably, the filtering body can be processed from multiple threadlike cotton bodies.

[13]      Preferably, the filtering part can further include an oil absorbing body, wherein the sealing bracket can be fastened on the inner wall of the open end of the shell; and one end of the sealing bracket can be pressed against the oil absorbing body, and the other opposite end can support the filtering body.

- [14] Preferably, the oil absorbing body can be provided with a through hole for accommodating the hollow pipe, wherein one end part of the hollow pipe can be positioned outside the through hole, and in butt joint with the sealing bracket.
- [15] Preferably, the sealing bracket can be annular, and the periphery of the sealing bracket can be hermetically connected with the inner wall of the hollow cavity.
- [16] Preferably, the heating body can include a heating wire, a heating seat fastened at one end of the hollow pipe, and a battery and a control switch arranged in the hollow cavity, wherein the control switch, the battery, the heating seat and the heating wire can be connected in sequence.
- [17] Preferably, the heating seat can be provided with a bump for being inserted into the pipe orifice of the hollow pipe, wherein the bump can be hermetically connected with the hollow pipe.
- [18] Preferably, the periphery of the heating seat can be hermetically connected with the inner wall of the hollow cavity.
- [19] Regarding the electronic atomizing inhalation device disclosed in the embodiments in this disclosure, the filtering part can be provided with a filtering body fastened at one open end of the shell, and can be processed from multiple threadlike cotton bodies, thus nicotine, nicotinamide, and tobacco tar in the smoke generated in the electronic atomizing inhalation device can be filtered, and the probability of harmful substances harming human health can be lowered; furthermore, the filtering body can have certain elasticity and be similar to a cigarette nozzle, thus improving user experience; and the electronic atomizing inhalation device is simple in structure, and is safe, reliable, attractive, and original.

[20] **【BRIEF DESCRIPTION OF THE DRAWINGS】**

- [21] In order to more clearly illustrate the embodiments of the disclosure, drawings needed for describing the embodiments are introduced briefly below. It should be noted that the drawings in the following description correspond only to certain embodiments of the disclosure. For those skilled in the art, other drawings can further be obtained according to these drawings without any inventive efforts.
- [22] Fig. 1 is a schematic diagram illustrating an exploded view of the structure of an electronic atomizing inhalation device, according to an embodiment of the present disclosure.
- [23] Fig. 2 is a schematic diagram illustrating a sectional view of the assembly of an electronic atomizing inhalation device, according to an embodiment of the present disclosure.
- [24] Fig. 3 is a schematic diagram illustrating a section view of the assembly of an electronic atomizing inhalation device, according to another embodiment of the present disclosure.

[25] Fig. 4 is a schematic diagram illustrating a section view of the assembly of an electronic atomizing inhalation device, according to yet another embodiment of the present disclosure.

[26] Fig. 5 is a schematic diagram illustrating a section view of the assembly of a heating seat including a sealing portion and a fixed base, according to yet another embodiment of the present disclosure.

[27] Fig. 6 provides a prospective view of the assembly of the heating seat illustrated in Fig. 5, according to an embodiment of the present disclosure.

[28] **【DETAILED DESCRIPTION OF THE EMBODIMENTS】**

[29] The preferred embodiments of the present disclosure are described in reference to the drawings below.

[30] Fig. 1 and Fig. 2 illustrate a first embodiment of the electronic atomizing inhalation device of the present disclosure.

[31] Fig. 1 is a schematic diagram illustrating an exploded view of the electronic atomizing inhalation device, according to one embodiment of the present disclosure. In this embodiment, the electronic atomizing inhalation device can include:

[32] A shell 1, which can include a hollow cavity 11, which can include a hollow pipe 3 therein.

[33] An atomizing part and a filtering part arranged in the hollow cavity 11, wherein the atomizing part can include a heating body fixed on the hollow pipe 3, and a liquid storage part 42 wound outside the hollow pipe 3.

[34] The filtering part can be sleeved on one side of the atomizing part; and the filtering body 41 of the filtering part can be fastened on an open end of the shell 1 through a sealing bracket 43.

[35] The shell 1 can have a hollow pipe body structure with two open ends, and the hollow cavity 11 of the shell 1 can be used for mounting and accommodating the atomizing part, the hollow pipe 3, and the filtering part. In this embodiment, the shell can be made of plastic, such as an ABS (Acrylonitrile Butadiene Styrene) material via a polishing process.

[36] The atomizing part can be arranged in the hollow cavity 11, have the liquid solution stored therein heated to generate smoke, and can be fastened at the bottom (shown in the drawing) of the hollow cavity 11.

[37] In this embodiment, the atomizing part can include a heating body and a liquid storage part (e.g., an oil absorbing body) 42, wherein the heating body can be fixed on the hollow pipe 3; and the liquid storage part 42 can be wound outside the hollow pipe 3, and the liquid storage part can include a cotton core for storing liquid/solution.

[38] The heating body can include: a heating wire 212, a heating seat 21 fastened at one end of the hollow pipe 3, and a battery 22 and a control switch 23 arranged in the

hollow cavity 11, wherein the control switch 23, the battery 22, the heating seat 21 and the heating wire 212 can be connected in sequence.

[39] Specifically, the battery 22 can be used for supplying power, and heat produced by the heating seat 21 can be used for heating the liquid solution in the hollow cavity 11 via the heating wire 212. The liquid solution can be stored in the liquid storage part 42. In this embodiment, the heating wire can be wound around the hollow pipe 3, between the hollow pipe 3 and the liquid storage part 42, as shown in Fig. 1.

[40] In this embodiment, the control switch 23 can be connected with a top cover 5, and switched on or off by pressing the top cover 5. When a circuit is switched on, the battery 22 can be used for supplying power, the heating seat 21 can function, and the heating wire 212 can be used for heating the liquid solution in the hollow cavity 11 to produce smoke.

[41] Wherein, the hollow pipe 3 can be a structural part for conveying smoke, can be provided with openings at the two ends, and can be hollow. In this embodiment, the heating seat 21 can be provided with a bump 211 for being inserted into the pipe orifice of the hollow pipe 3, and the bump 211 can be hermetically connected with the hollow pipe 3.

[42] The formed bump 211 can keep the end side on the hollow pipe 3 sealed.

[43] In a preferred embodiment, the periphery of the heating seat 21 can be hermetically connected with the inner wall of the hollow cavity 11.

[44] Specifically, the heating seat 21 can be used for separating and sealing, on one side, the cavity housing parts such as the battery 22, the control switch 23, etc., and, on the other side, the cavity including the hollow pipe 3. Therefore, smoke produced on one side of the hollow pipe 3 can be prevented from being diffused from the tail end of the pipe, and thus enhancing the sealing performance of the electronic atomizing inhalation device. Furthermore, a clamping structure can be formed by the bump 211 formed on the heating seat 21 and the hollow pipe 3 to prevent the above-described situation of smoke diffusion from occurring. In some embodiment, as will be discussed below in view of Figs. 4-6, the heating seat can include, for example, a sealing portion and a fixed base.

[45] The filtering part can have a structure for filtering, for example, nicotine, nicotinamide, and tobacco tar in the smoke generated in the electronic atomizing inhalation device, and can include the filtering body 41 and a sealing bracket 43, wherein the sealing bracket 43 can be fastened on the inner wall of the open end of the shell; and one end of the sealing bracket can be pressed against the liquid storage part (e.g., oil absorbing body) 42, and the other opposite end can be used for supporting the filtering body 41.

[46] The oil absorbing body 42 can be sleeved outside the hollow pipe 3 and the bump

211 on the heating seat 21, and can be provided with a through hole 422 for accommodating the hollow pipe 3.

- [47] After the heating seat 21 is assembled together with the hollow pipe 3 with the abovementioned method, the oil absorbing body 42 can be sleeved. After assembly, the top end (shown in the drawing) of the hollow pipe 3 may not be totally wrapped by the oil absorbing body 42, and the exposed part can be in butt joint with the sealing bracket 43, thus the leak tightness of an air path can be ensured, and smoke can be prevented from leaking outwards.
- [48] In some embodiments, the oil absorbing body 42 can play a role in assisting in absorbing, for example, nicotine, nicotinamide, and tobacco tar in the smoke generated in the electronic atomizing inhalation device.
- [49] The sealing bracket 43 can be annular, and the periphery of the sealing bracket 43 can be hermetically connected with the inner wall of the hollow cavity 11. The sealing bracket 43 can be pressed against the oil absorbing body 42 on one hand, and can be used for supporting the filtering body 41 on the other hand. The effect of hermetically connecting the periphery of the sealing bracket 43 with the inner wall of the hollow cavity 11 can be the same as the effect of hermetically connecting the periphery of the heating seat 21 with the inner wall of the hollow cavity 11.
- [50] The filtering body 41 can be fastened at the open end of the shell 1, and processed from multiple threadlike cotton bodies. This structure can allow the filtering body 41 to have high elasticity and provide the same touch feel as an ordinary cigarette nozzle, and thus improving user experience.
- [51] Furthermore, the filtering body 41 including multiple threadlike cotton bodies can be used for adsorbing particles in the produced smoke so as to realize the filtering function. The filtering body 41 can be used for filtering, for example, nicotine, nicotinamide, and tobacco tar in the smoke, contributing to reducing the harm caused by the above-described harmful substances on human health.
- [52] According to the electronic atomizing inhalation device provided in the embodiments of the present disclosure, a filtering body 41 of the filtering part can be fastened at one open end of the shell, and be processed from multiple threadlike cotton bodies, thus nicotine, nicotinamide, and tobacco tar in the smoke generated in the electronic atomizing inhalation device can be filtered, and thus, reducing the probability of the harmful substances harming human health; furthermore, the filtering body can have certain elasticity and be closer to a cigarette nozzle, thus improving user experience; and the electronic atomizing inhalation device can be simple in structure, and safe, reliable, attractive, and original.
- [53] Fig. 3 illustrates a second embodiment of the electronic atomizing inhalation device of the present disclosure. The electronic atomization inhalation device illustrated in

Fig. 3 is similar to the one illustrated in Fig. 2. In particular, the heating body in this embodiment can also include: a heating wire 212', a heating seat 21 fastened at one end of the hollow pipe 3, and a battery 22 and a control switch 23 arranged in the hollow cavity 11, wherein the control switch 23, the battery 22, the heating seat 21 and the heating wire 212' can be connected in sequence, as illustrated in the figure.

[54] In this embodiment, however, the heating wire 212' is not wound around the hollow pipe 3, but can, instead, be wound around a fiber rope 10, which can be mounted inside (e.g., across) the hollow pipe 3. The control switch 23 can be connected with a top cover 5, and switched on or off by pressing the top cover 5. When the circuit is switched on, the battery 22 can be used for supplying power to the heating seat 21, which can heat up the heating wire 212', which, in turn, can be used for heating the liquid solution in the hollow cavity 11 to produce smoke.

[55] Fig. 4 illustrates a third embodiment of the electronic atomizing inhalation device of the present disclosure. The electronic atomization inhalation device illustrated in Fig. 4 is similar to the one illustrated in Fig. 3. In this embodiment, the heating seat can include a sealing portion 33 and a fixed base 37 (shown in Figs. 5 and 6), the heating seat placed in the hollow cavity 11 between the battery chamber 48 and the atomizing part 49, separating the battery chamber 48 and the atomizing part 49. The sealing portion 33 can be hermetically connected with the inner wall of the hollow cavity 11. The heating seat can connect the battery 22 and the heating wire 212' mounted in the hollow pipe 3.

[56] In this embodiment, the sealing portion 33 can sleeve, at least partially, on the fixed base 37 which can support the atomizing part 49 of the device. The sealing portion 33 can provide one or more air inlets 12 that can allow air to flow from outside of the shell 1 into the hollow cavity 11 and then into the hollow pipe 3 through a central passage 38 in the fixed base. The illustrated structure of Fig. 3, in particular, the sealing portion 33, can prevent liquid stored in the atomizing part (e.g., the liquid storage part 42) from entering the battery chamber 48. In addition, by having one or more air inlets between the battery chamber 48 and the atomizing part 49, the device of this embodiment can provide a more consistent air flow into the hollow pipe 3 than conventional devices with air inlets near the switch 5 end of the device. In the conventional devices, air enters the device near the switch 5 end of the device and has to travel around and along the length of the battery. As such, the air flow may not be uniform within a device and/or among different devices, depending on the installation of the battery.

[57] Fig. 5 illustrates in detail the exemplary structure of the heating seat including the sealing portion 33 of Fig. 4. The sealing portion 33 can include a top portion 34 and a bottom portion 35. Between the top portion 34 and the bottom portion 35 of the sealing

portion 33 can form an annular groove. When the sealing portion 33 can be sleeved on the fixed base 37 and placed in the hollow cavity 11, an annular cavity can form between the annular groove and the inner wall of the hollow cavity 11. The air inlet 12 can allow air to enter into the annular cavity and then the central passage 38 of the fixed base 37 through inlet 39, eventually reaching the hollow pipe 3.

- [58] In this embodiment, the bottom portion 35 of the sealing portion 33 can be provided with a bump 31 for preventing liquid from the atomizing part of the device to enter into the battery chamber below. The bump 31 can optionally include an air flow sensing hole 32 for activating the switch of the device in response to sensing a small amount of air flow.
- [59] Fig. 6 provides a prospective view of the assembly of the heating seat illustrated in Fig. 5. As illustrated in Fig. 6, the top portion 34 and the bottom portion 35 of the sealing portion 33 are sleeved on the fixed base 37, which includes an air inlet 12 that allows air from outside of the device to flow through the central passage 38 of the fixed base 37 and into the hollow pipe (not shown in Fig. 6.)
- [60] In one or more of the embodiments, the electronic atomizing inhalation device can be an electronic cigarette.
- [61] The embodiments disclosed above are only the preferred embodiments of the present disclosure, and of course, not to be used to limit the scope of the claims of the present disclosure. Therefore, equivalent changes made to the claims according to the present disclosure are to be covered by the scope of the present disclosure.

## Claims

- [Claim 1] An electronic atomizing inhalation device, characterized by comprising:  
a shell including a hollow cavity which includes a hollow pipe arranged therein;  
an atomizing part and a filtering part arranged in the hollow cavity, the atomizing part including a heating body fixed on the hollow pipe, and a liquid storage part wound outside the hollow pipe, the heating body configured to atomize a liquid solution stored in the liquid storage part; wherein the filtering part is sleeved on one end of the atomizing part; and includes a filtering body fastened on an open end of the shell through a sealing bracket, the filtering body configured to filter the atomized liquid solution passing through the hollow pipe.
- [Claim 2] The electronic atomizing inhalation device as claimed in claim 1, wherein the filtering body is processed from multiple threadlike cotton bodies.
- [Claim 3] The electronic atomizing inhalation device as claimed in claim 1, wherein the liquid storage part further comprises an oil absorbing body, and wherein the sealing bracket is fastened on the inner wall of the open end of the shell, one end of the sealing bracket pressed against the oil absorbing body, and an opposite end supporting the filtering body.
- [Claim 4] The electronic atomizing inhalation device as claimed in claim 3, wherein the oil absorbing body is provided with a through hole for accommodating the hollow pipe, wherein one end part of the hollow pipe is positioned outside the through hole, and is in butt joint with the sealing bracket.
- [Claim 5] The electronic atomizing inhalation device as claimed in claim 3, wherein the sealing bracket is annular, and a periphery of the sealing bracket is hermetically connected with an inner wall of the hollow cavity.
- [Claim 6] The electronic atomizing inhalation device as claimed in claim 1, wherein the heating body comprises a heating wire, a heating seat fastened at one end of the hollow pipe, and a battery and a control switch arranged in the hollow cavity, wherein the control switch, the battery, the heating seat, and the heating wire are connected in sequence.
- [Claim 7] The electronic atomizing inhalation device as claimed in claim 6,

wherein the heating seat is provided with a bump for being inserted into the pipe orifice of the hollow pipe, wherein the bump is hermetically connected with the hollow pipe.

[Claim 8] The electronic atomizing inhalation device as claimed in claim 7, wherein the periphery of the heating seat is hermetically connected with the inner wall of the hollow cavity.

[Claim 9] The electronic atomizing inhalation device as claimed in claim 6, wherein the heating wire comprises a coil wrapped around the hollow pipe.

[Claim 10] The electronic atomizing inhalation device as claimed in claim 6, wherein the heating wires comprises a coil wrapped around a fiber rope mounted across the hollow pipe.

[Claim 11] The electronic atomizing inhalation device as claimed in claim 6, wherein the heating seat comprises:  
a sealing portion sleeved on the fixed base, the sealing portion and the fixed base placed in the hollow cavity and separating the atomizing part and the filtering part from a battery chamber.

[Claim 12] The electronic atomizing inhalation device as claimed in claim 11, wherein the sealing portion includes a top portion and a bottom portion forming an annular groove.

[Claim 13] The electronic atomizing inhalation device as claimed in claim 11, wherein the heating seat comprises a fixed base including an air inlet configured to allow air into the hollow pipe; and wherein the sealing portion is sleeved, at least partially, on the fixed base.

[Claim 14] The electronic atomizing inhalation device as claimed in claim 13, wherein the fixed base includes a central air passage connecting the air inlet with the hollow pipe.

[Claim 15] The electronic atomizing inhalation device as claimed in claim 11, wherein the sealing portion includes an air flow sensing hole configured for activating a switch in response to sensing an air flow.

[Claim 16] The electronic atomizing inhalation device as claimed in claim 1, wherein the electronic atomizing inhalation device comprises an electronic cigarette.

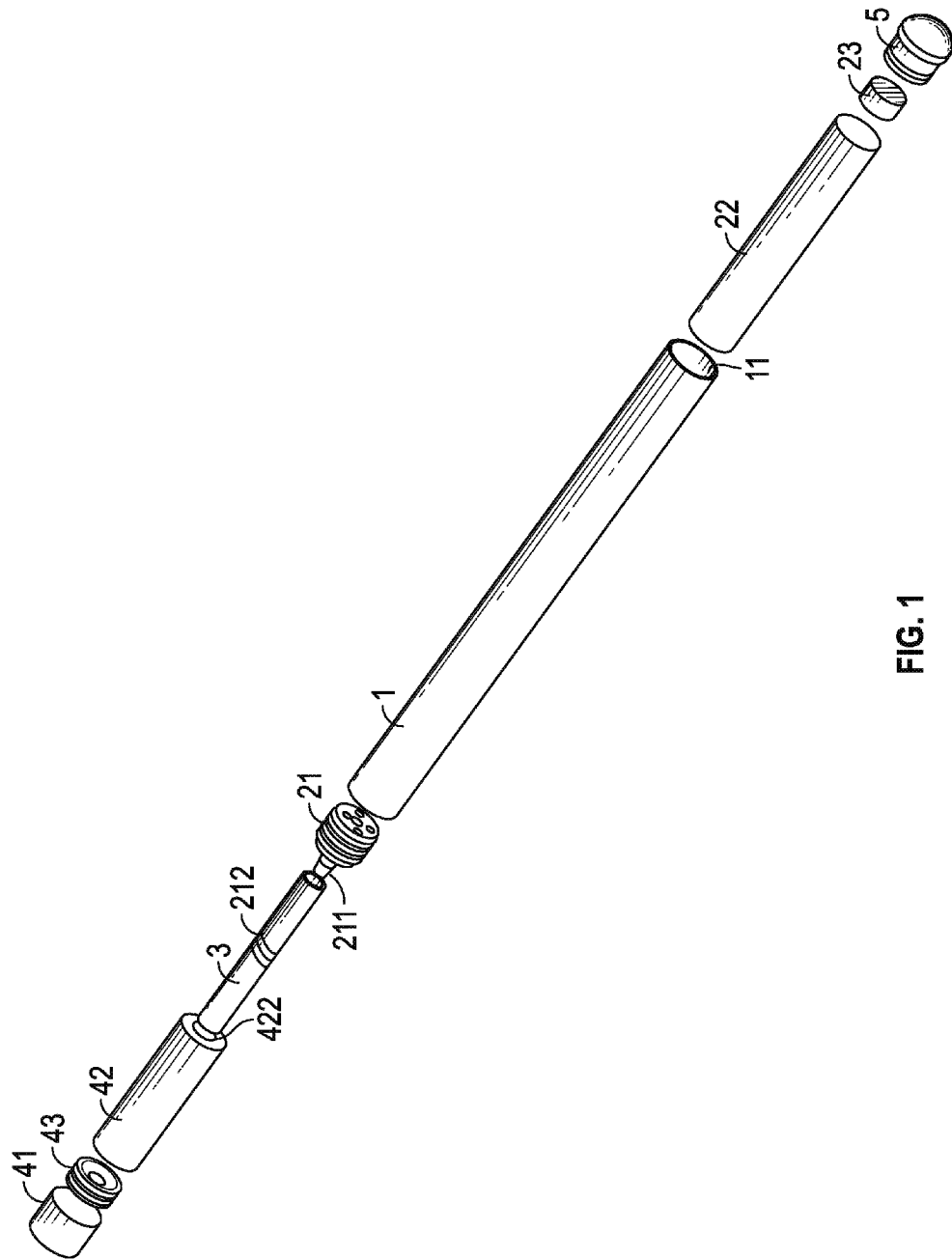


FIG. 1

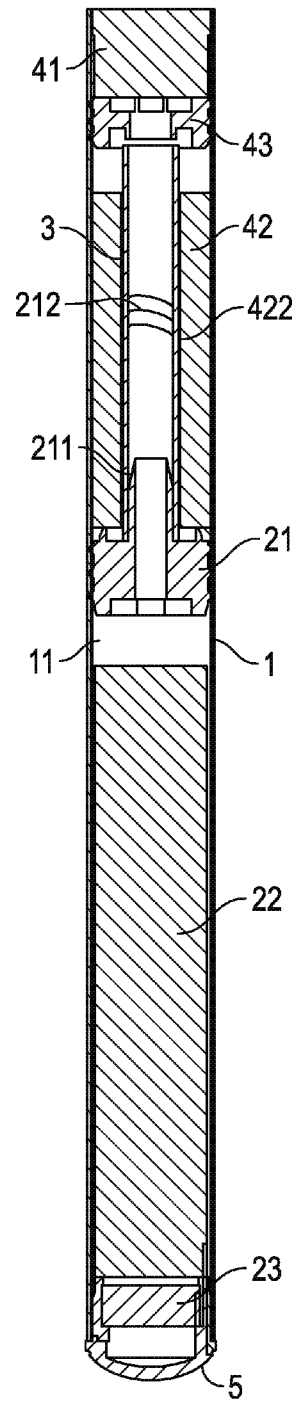


FIG. 2



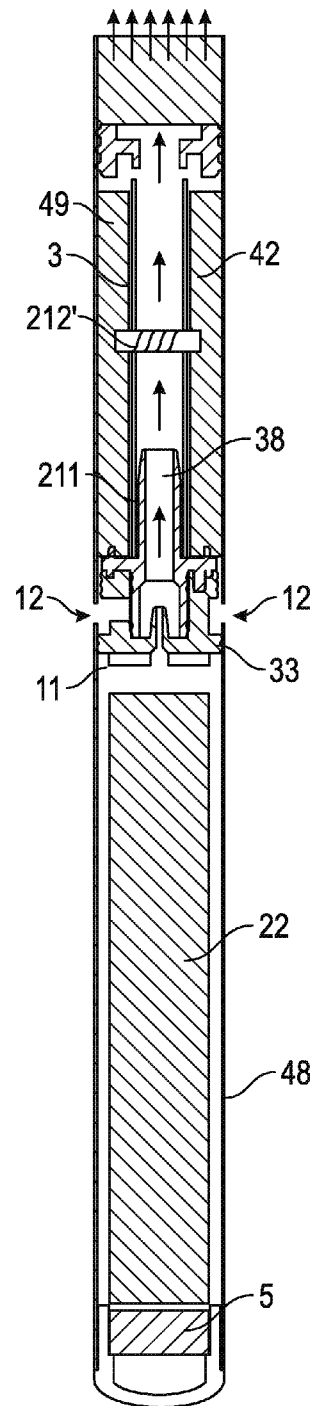


FIG. 4

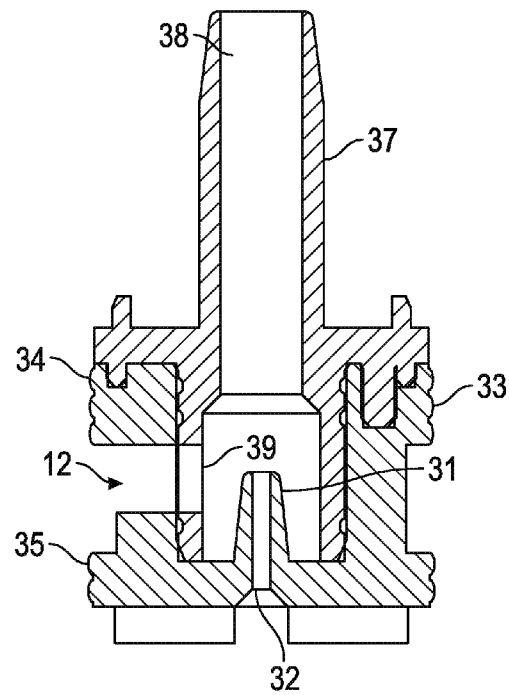


FIG. 5

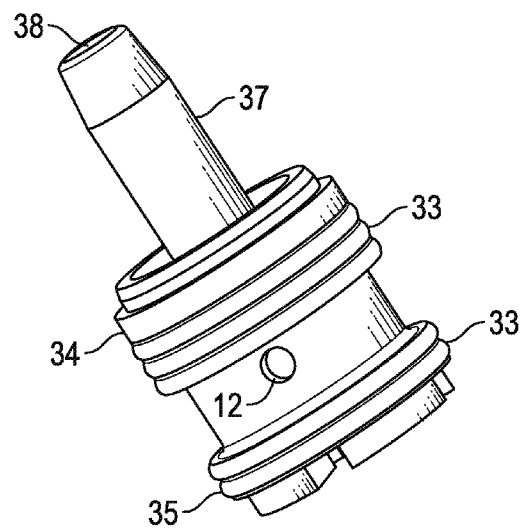


FIG. 6

**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/CN2013/090235

**A. CLASSIFICATION OF SUBJECT MATTER**

A24F 47/00 (2006.01) 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: A24F 47

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)

VEN, CNABS, CNTXT: 陈志平, 烟, 电子, 仿真, 模拟, 雾化, 替代, 虚拟, 通孔, 气孔, 过滤, 吸油, electronic, electrical, simulate, imitate, substitute, atomizer, cigar, cigarette, tobacco, screw thread, air hole?, air pore?, inlet, outlet, filter+, wire, heat+

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                                                          | Relevant to claim No. |
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| Y         |                                                                                                                                             | 10, 12-14             |
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| Y         | CN 201750712 U (CHEN Z) 23 February 2011 (23.02.2011) see claims 1-16, paragraphs[0043], [0052], [0058]-[0061] and figures 1-3, 6           | 12-14                 |
| A         | CN 201127292 Y (ZHENGZHOU TOBACCO INST CHINA TOBACCO COR) 8 October 2008 (08.10.2008) see the whole document                                | 1-16                  |

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

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|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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| Date of the actual completion of the international search<br>7 March 2014 (07.03.2014)                                                                                                                       | Date of mailing of the international search report<br><b>03 Apr. 2014 (03.04.2014)</b> |
| Name and mailing address of the ISA/CN<br>The State Intellectual Property Office, the P.R.China<br>6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China<br>100088<br>Facsimile No. 86-10-62019451 | Authorized officer<br><b>WANG Xiaoyuan</b><br>Telephone No. (86-10)62085241            |

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/CN2013/090235

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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| A         | EP 2443947 A1 (JAPAN TOBACCO INC. et al.) 25 April 2012 (25.04.2012) see the whole document | 1-16                  |

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

International application No.

PCT/CN2013/090235

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