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(54) **MULTIFUNCTIONAL ELECTRONIC CIGARETTE SET HAVING CIRCUMFERENTIAL HEATING**

(57) The present invention discloses a main body (1) and an atomizing assembly (2), wherein the main body (1) is provided with a slide switch (101), a main switch (7), and a heating assembly (3), and the atomizing assembly (2) is detachably embedded and fixed to the main body (1). The present disclosure combines a heating circuit with a glass substrate, performs the layering and

segmenting treatments to obtain a glass cup with a printed heating circuit, and circumferentially heats a cigarette, so that the circumferential heating of the cigarette is relatively uniform. The main switch and the slide switch of the present disclosure are configured to prevent children from accidentally opening the device and being harmed.

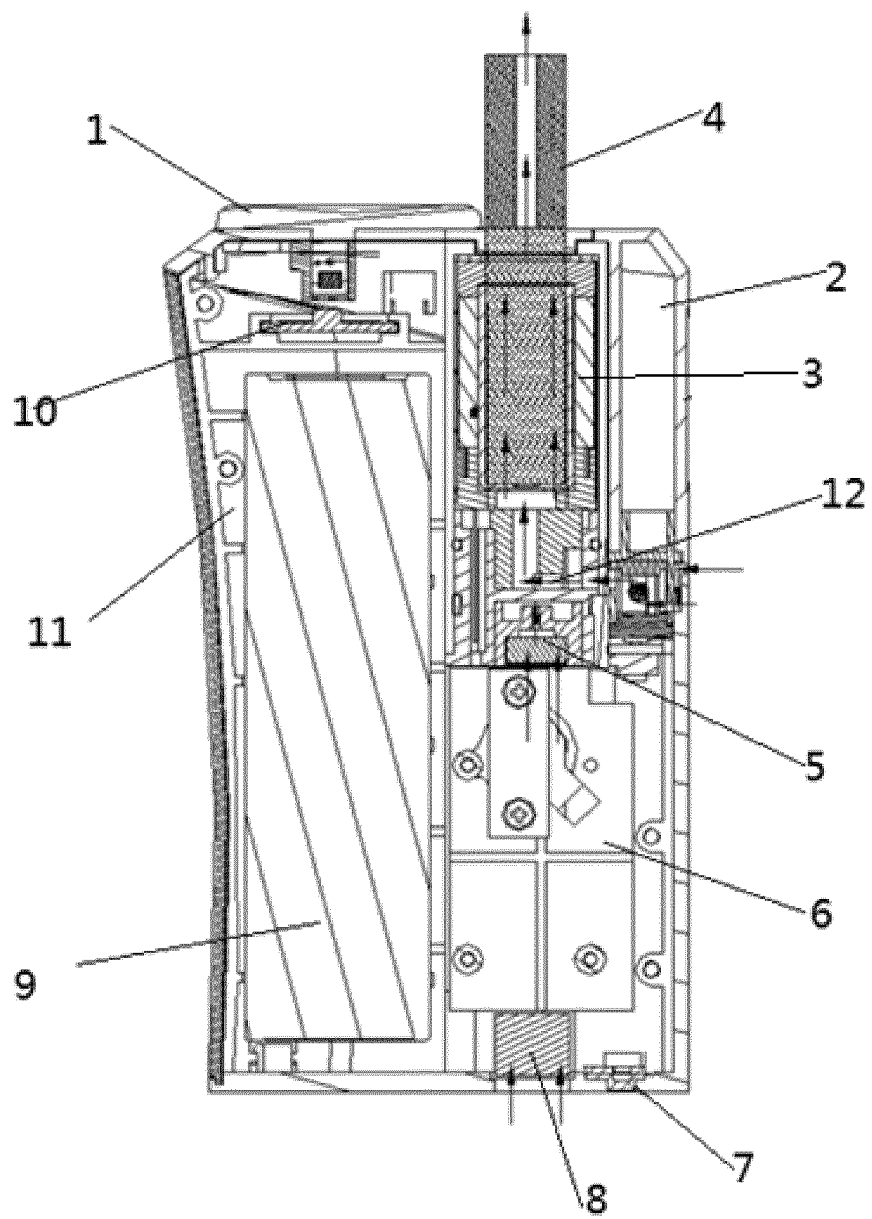


FIG. 1

Description

TECHNICAL FIELD

[0001] The present disclosure pertains to the technical field of electronic smoking device, and more particularly relates to a multifunctional electronic smoking device for circumferentially heating.

BACKGROUND

[0002] Tobacco industry has gone through a revolution ever since the emergence of electronic cigarettes. This revolution is certainly a welcome news for smokers and second hand smokers. Electronic cigarette leads the way of this reform, however, electronic cigarettes have not reached the expected success level because of the fact that electronic cigarettes cannot completely satisfy the psychological and physiological needs of consumers. As a result, currently the electronic cigarettes are not replacing conventional cigarettes. Recently, a novel technique of heated non-burning tobacco technology has been developed. In this technology, different portions of tobacco are heated. For example, the IQOS series produced by Philip Morris middle portion of tobacco is heated. British American Tobacco GLO employs the (flexible printed circuit) FPC heating module to achieve circumferential heating. Some of these devices may even combine the two methods mentioned above. However, most of these smoking devices have many issues which have not been completely solved at this time.

[0003] Currently, a novel smoking device for heating tobacco only has a heating module. At this time, there is no device that is capable of properly combining electronic atomization with a low-temperature baking technique. Moreover, some of the existing electronic atomization devices on the market need to repeat e-liquid injection, which is inconvenient and unsanitary. In addition, the existing circumferential heating element employs a ceramic material, so that the heating speed is slow, the strength of the heating element is low, and the heating element is readily broken off. Furthermore, the heating element easily produces residue which is inconvenient to clean. Electronic cigarettes or the smoking device are generally provided with a push-button switch, without a lock capability for the power source. This makes misuse of the device likely and, poses a potential safety hazard to children and others.

SUMMARY

[0004] The objective of the present disclosure is to provide a multifunctional electronic smoking device for circumferentially heating, which effectively solves the problems of electronic cigarettes and low-temperature baking cigarettes such as a dissimilar smoking experience, non-uniform circumferential heating, and being unlocked.

[0005] The objective of the present disclosure is realized by the following technical solutions:

ized by the following technical solutions:

a multifunctional electronic smoking device for circumferentially heating, including:

the main body 1, wherein the main body 1 is provided with the slide switch 101, the main switch 7 and the heating assembly 3;

the atomizing assembly 2; wherein the atomizing assembly 2 is detachably embedded and connected to the main body 1.

[0006] In the multifunctional electronic smoking device for circumferentially heating, the main body 1 further includes the inner housing 11, the electrical core 9, and the airflow sensor 5. The inner housing 11 includes the heating chamber 1103 and the atomizing chamber 1102. The heating chamber 1103 is connected to the atomizing chamber 1102 through the air inlet slot 1101 for ventilation.

[0007] In the multifunctional electronic smoking device for circumferentially heating, the heating chamber 1103 is provided with the heating assembly 3. The heating assembly 3 includes the heating cup 305, the fixed sleeve 301, the outer housing 302 and the snap holder 307. The bottom and the opening of the heating cup 305 are fixed in the outer housing 302 by the snap holder 307 and the fixed sleeve 301, respectively. A gap is arranged between the heating cup 305 and the outer housing 302, and is filled with the thermal insulation layer 303. The temperature sensor 304 is arranged on an outer wall of the heating cup 305.

[0008] In the multifunctional electronic smoking device for circumferentially heating, the heating cup 305 is a heating glass cup, and a heating element on the heating cup 305 is the resistance-type printed heating circuit 3051.

[0009] In the multifunctional electronic smoking device for circumferentially heating, the atomizing assembly 2 includes the atomizing holder 206, the e-liquid storage cover 202 and the e-liquid storage chamber 201. The e-liquid storage chamber 201 is fixed on the e-liquid storage cover 202. The atomizing wire 204 is arranged on the atomizing holder 206, and is electrically connected to an electrode 207.

[0010] In the multifunctional electronic smoking device for circumferentially heating, the slide switch 101 includes the Hall element 1011, the magnet 1012, and the push button 1013. The magnet 1012 is fixed on the push button 1013. The Hall element 1011 is located at a position allowing the Hall element 1011 to sense a presence of a magnetic field of the magnet 1012 when the push button 1013 slides to a first position, and to sense a disappearance of the magnetic field of the magnet 1012 when the push button 1013 slides to a second position.

[0011] In the multifunctional electronic smoking device for circumferentially heating, a sensor airflow passage is defined by the gap on the outer housing of the smoking

device, the gap between the airflow sensor 5 and the inner housing, and an air hole of the bottom of the heating cup 305. The heating chamber 1103 is connected to the atomizing chamber 1102 through the air inlet slot 1101 for ventilation, so as to collectively define a smoke airflow passage. The sensor airflow passage is arranged in parallel with the smoke airflow passage and is connected to the smoke airflow passage through the vent hole 12 for ventilation. A ventilation connection point is located on an upstream side of the heating assembly 3 and is located on a downstream side of the smoke airflow passage. The airflow sensor 5 is located in the sensor airflow passage.

[0012] The working process of the present disclosure is as follows.

[0013] Opening the main switch 7, pushing the push button 1013 on the smoking device, inserting a cigarette into the heating cup 305, and inserting the atomizing assembly 2 into the smoking device. At this time, the smoking device enters a working state, the heating cup 305 heats the cigarette inserted in the heating cup 305, and then the atomizing wire 204 in the atomizing assembly 2 enters a preheating state. After heating is completed, a smoker can smoke through a cigarette butt. The air in the sensor airflow passage during the smoking process is also sucked away, thereby generating a negative pressure to the airflow sensor 5. After that, a heating wire in the atomizing assembly 2 is driven to work, i.e. e-liquid is atomized by the atomizing assembly. The air enters the sensor airflow passage from a gap of a printed circuit board (PCB) circuit 8 at a bottom of the outer housing, and gets into the heating assembly 3. The heating wire heats and atomizes the e-liquid to generate the smoke. Then, the smoke is mixed with the air to generate a mixture and enter the heating cup 305. The mixture of the air and the smoke is mixed with the smoke generated after the cigarette is heated by the heating cup 305, and then is smoked by the smoker.

[0014] The present disclosure has the following advantages.

1. The smoking device is provided with two detachable assemblies, i.e. the main body and the atomizing assembly, which is convenient for the smoker to operate. The atomizing assembly of the present disclosure is disposable, without the need of repeating the e-liquid injection, which is convenient, clean and sanitary.

2. The heating cup and the atomizing assembly are both arranged in the smoking device of the present disclosure to combine the low-temperature baking cigarette and the atomized e-liquid of electronic cigarettes, thereby effectively remedying the defects of dissimilar smoking feeling experience of the e-liquid smoke generated by the atomizing assembly, and inadequate flavor.

3. In the present disclosure, the sensor airflow pas-

sage and the smoke airflow passage are independent and arranged in parallel in the smoking device, which effectively improves the nonuniform distribution of the airflow and the unstable suction function caused by the coincidence of the sensor airflow passage and the smoke airflow passage. Meanwhile, the sensor is prevented from the damage caused by the condensate generated during the smoking process due to the coincidence of the sensor airflow passage and the smoke airflow passage.

4. The present disclosure combines the heating circuit with the glass substrate, performs the layering and segmenting treatments to obtain a glass cup with a printed heating circuit. The printed heating circuit can uniformly circumferentially heat the cigarette.

5. In the present disclosure, the main switch and the slide switch are configured to prevent children from accidentally opening the device and being harmed.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015]

FIG. 1 is a schematic diagram showing an internal structure of the smoking device of the present disclosure.

FIG. 2 is a schematic diagram showing a structure of a main body of the smoking device of the present disclosure.

FIG. 3 is a schematic diagram showing a structure of a heating assembly of the smoking device of the present disclosure.

FIG. 4 is a schematic diagram showing a structure of an atomizing assembly of the smoking device of the present disclosure.

FIG. 5 is a schematic diagram showing a structure of an inner housing of the smoking device of the present disclosure.

FIG. 6 is a schematic diagram showing a structure of a slide switch of the smoking device of the present disclosure.

FIG. 7 is a schematic diagram showing a structure of a heating cup of the smoking device of the present disclosure.

[0016] In the drawings: 1-main body, 101-slide switch, 2-atomizing assembly, 201-e-liquid storage chamber, 202-e-liquid storage cover, 203-atomizing cover, 204-atomizing wire, 205-insulating ring, 206-atomizing holder, 207-electrode, 3-heating assembly, 301-fixed sleeve,

302-outer housing, 303-thermal insulation layer, 304-temperature sensor, 305-heating cup, 3051-heating circuit, 306-snap ring, 307-snap holder, 4-smoking product, 5-airflow sensor, 6-PCB bracket, 7-main switch, 8-PCB circuit, 9-electrical core, 10-Hall switch board, 1011-Hall element, 1012-magnet, 1013-push button, 11-inner housing, 1101-air inlet slot, 1102-atomizing chamber, 1103-heating chamber, and 12-vent hole.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0017] The following embodiment is intended to illustrate the present disclosure rather than limiting the scope of the protection of the present disclosure.

Embodiment

[0018] The multifunctional electronic smoking device for circumferentially heating, including:

the main body 1, wherein the main body 1 is provided with the slide switch 101, the main switch 7 and the heating assembly 3;

the atomizing assembly 2; wherein the atomizing assembly 2 is detachably embedded and connected to the main body 1.

[0019] In the multifunctional electronic smoking device for circumferentially heating, the main body 1 further includes the inner housing 11, the electrical core 9, and the airflow sensor 5. The inner housing 11 includes the heating chamber 1103 and the atomizing chamber 1102. The heating chamber 1103 is connected to the atomizing chamber 1102 through the air inlet slot 1101 for ventilation.

[0020] In the multifunctional electronic smoking device for circumferentially heating, the heating chamber 1103 is provided with the heating assembly 3. The heating assembly 3 includes the heating cup 305, the fixed sleeve 301, the outer housing 302 and the snap holder 307. The bottom and the opening of the heating cup 305 are fixed in the outer housing 302 by the snap holder 307 and the fixed sleeve 301, respectively. A gap is arranged between the heating cup 305 and the outer housing 302, and is filled with the thermal insulation layer 303. The temperature sensor 304 is arranged on an outer wall of the heating cup 305.

[0021] In the multifunctional electronic smoking device for circumferentially heating, the heating cup 305 is a heating glass cup, and a heating element on the heating cup 305 is the resistance-type printed heating circuit 3051.

[0022] In the multifunctional electronic smoking device for circumferentially heating, the atomizing assembly 2 includes the atomizing holder 206, the e-liquid storage cover 202 and the e-liquid storage chamber 201. The e-liquid storage chamber 201 is fixed on the e-liquid storage

cover 202. The atomizing wire 204 is arranged on the atomizing holder 206, and is electrically connected to the electrode 207.

[0023] In the multifunctional electronic smoking device for circumferentially heating, the slide switch 101 includes the Hall element 1011, the magnet 1012, and the push button 1013. The magnet 1012 is fixed on the push button 1013. The Hall element 1011 is located a position allowing the Hall element 1011 to sense a presence of a magnetic field of the magnet 1012 when the push button 1013 slides to a first position, and to sense a disappearance of the magnetic field of the magnet 1012 when the push button 1013 slides to a second position.

[0024] In the multifunctional electronic smoking device for circumferentially heating, a sensor airflow passage is defined by the gap on the outer housing of the smoking device, the gap between the airflow sensor 5 and the inner housing, and an air hole of the bottom of the heating cup 305. The heating chamber 1103 is connected to the atomizing chamber 1102 through the air inlet slot 1101 for ventilation, so as to collectively define a smoke airflow passage. The sensor airflow passage is arranged in parallel with the smoke airflow passage and is connected to the smoke airflow passage through the vent hole 12 for ventilation. The ventilation connection point is located on an upstream side of the heating assembly 3 and is also located on a downstream side of the smoke airflow passage. The airflow sensor 5 is located in the sensor airflow passage.

[0025] The working process of the present disclosure is as follows.

[0026] The main switch 7 is turned on, and the push button 1013 on the smoking device is pushed away. A cigarette is inserted into the heating cup 305, and the atomizing assembly 2 is inserted into the smoking device. At this time, the smoking device enters a working state, the heating cup 305 heats the cigarette inserted in the heating cup 305, and the atomizing wire 204 in the atomizing assembly 2 enters a preheating state. After the heating process is complete, the smoker can smoke through a cigarette butt. During the smoking process, the air in the sensor airflow passage is also sucked away, thereby generating a negative pressure to the airflow sensor 5. After that, the heating wire in the atomizing assembly 2 is driven to work, i.e. the e-liquid is atomized by the atomizing assembly. The air enters the sensor airflow passage from a gap of the PCB circuit 8 at the bottom of the outer housing, and reaches the heating assembly 3. The air is mixed with the smoke generated by the e-liquid that is heated and atomized by the heating wire, and then enters the heating cup 305. The mixture of the air and the smoke is mixed with the smoke generated by the cigarette that is heated by the heating cup 305, and then is smoked by the smoker.

Claims

1. A multifunctional electronic smoking device for circumferentially heating, comprising:

a main body (1), wherein the main body (1) is provided with a slide switch (101), a main switch (7) and a heating assembly (3); and

an atomizing assembly (2); wherein the atomizing assembly (2) is detachably embedded and connected to the main body (1).
2. The multifunctional electronic smoking device for circumferentially heating according to claim 1, wherein the main body (1) further comprises an inner housing (11), an electrical core (9), and an airflow sensor (5); and the inner housing (11) comprises a heating chamber (1103) and an atomizing chamber (1102), wherein the heating chamber (1103) is connected to the atomizing chamber (1102) through an air inlet slot (1101) for ventilation.
3. The multifunctional electronic smoking device for circumferentially heating according to claim 2, wherein the heating chamber (1103) is provided with a heating assembly (3); the heating assembly (3) comprises a heating cup (305), a fixed sleeve (301), an outer housing (302) and a snap holder (307); a bottom and an opening of the heating cup (305) are fixed in the outer housing (302) by the snap holder (307) and the fixed sleeve (301), respectively; a gap is arranged between the heating cup (305) and the outer housing (302), and is filled with a thermal insulation layer (303); and a temperature sensor (304) is arranged on an outer wall of the heating cup (305).
4. The multifunctional electronic smoking device for circumferentially heating according to claim 3, wherein the heating cup (305) is a heating glass cup, and a heating element on the heating cup (305) is a resistance-type printed heating circuit (3051).
5. The multifunctional electronic smoking device for circumferentially heating according to claim 4, wherein the atomizing assembly (2) comprises an atomizing holder (206), an e-liquid storage cover (202) and an e-liquid storage chamber (201); the e-liquid storage chamber (201) is fixed on the e-liquid storage cover (202); and an atomizing wire (204) is arranged on the atomizing holder (206), and is electrically connected to an electrode (207).
6. The multifunctional electronic smoking device for circumferentially heating according to claim 5, wherein the slide switch (101) comprises a Hall element (1011), a magnet (1012), and a push button (1013); the Hall element (1011) is fixed to the inner housing (11); the magnet (1012) is fixed on the push button (1013); the Hall element (1011) is located a position allowing the Hall element (1011) to sense a presence of a magnetic field of the magnet (1012) when the push button (1013) slides to a first position, and to sense a disappearance of the magnetic field of the magnet (1012) when the push button (1013) slides to a second position.
7. The multifunctional electronic smoking device for circumferentially heating according to claim 6, wherein a sensor airflow passage is defined by a gap on an outer housing of the smoking device, a gap between the airflow sensor (5) and the inner housing, and an air hole of the bottom of the heating cup (305); the heating chamber (1103) is connected to the atomizing chamber (1102) through the air inlet slot (1101) for ventilation, so as to define a smoke airflow passage; the sensor airflow passage is arranged in parallel with the smoke airflow passage and is connected to an airflow of the smoke airflow passage through a vent hole (12) for ventilation; a ventilation connection point is located on an upstream side of the heating assembly (3) and is located on a downstream side of the smoke airflow passage; and the airflow sensor (5) is located in the sensor airflow passage.

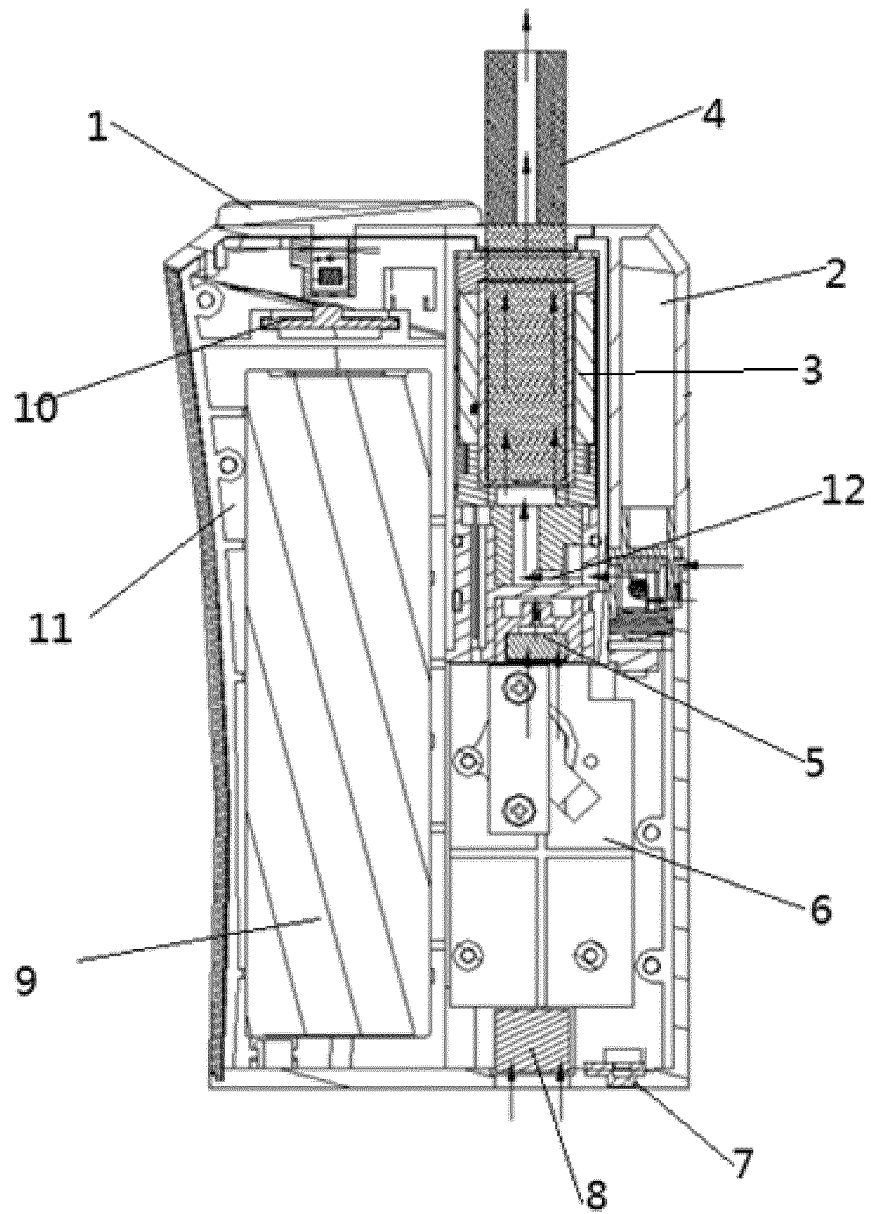


FIG. 1

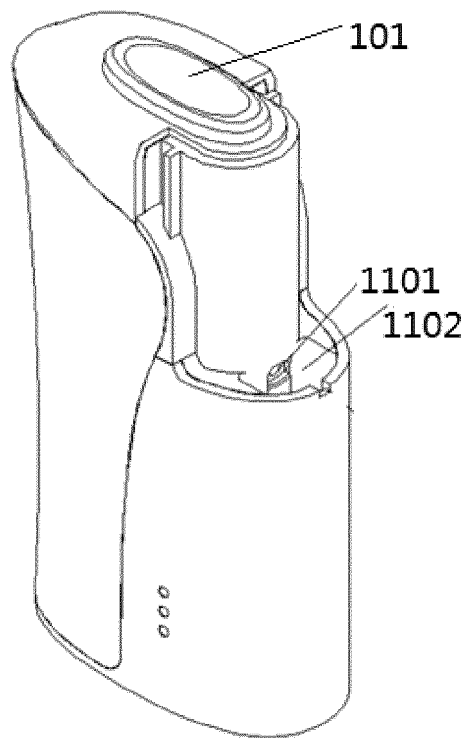


FIG. 2

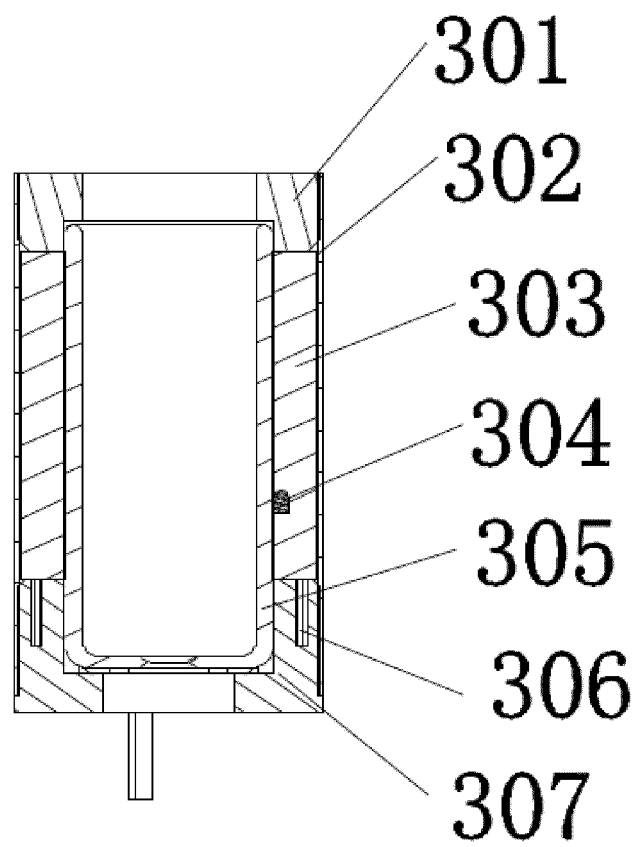


FIG. 3

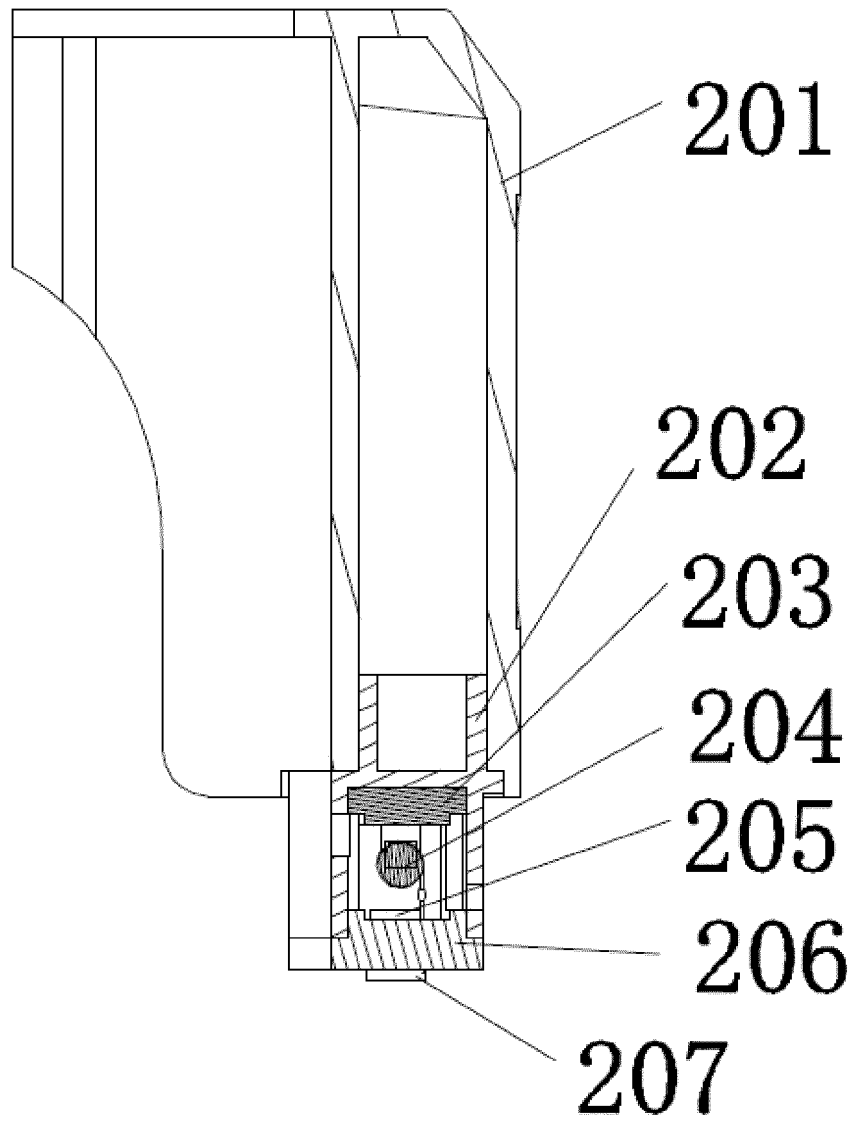


FIG. 4

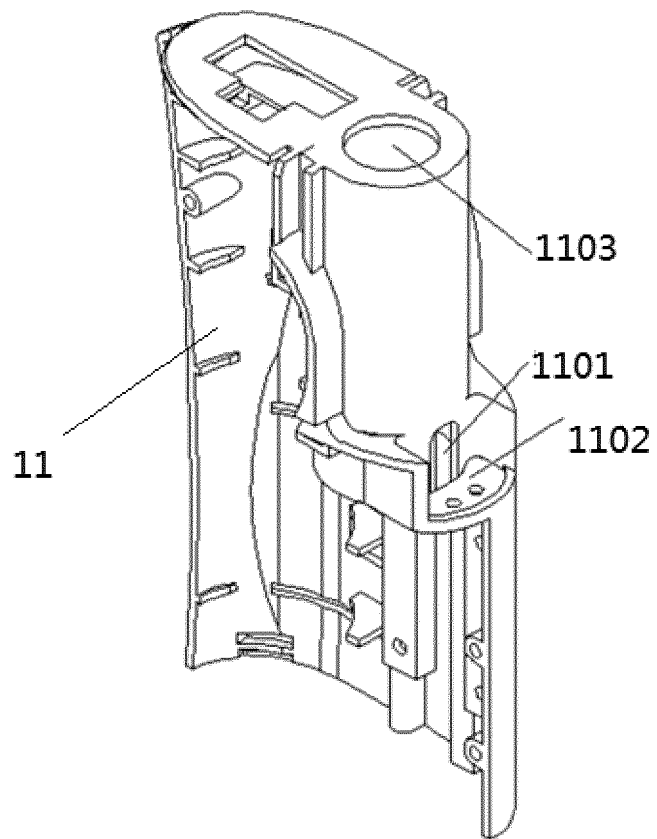


FIG. 5

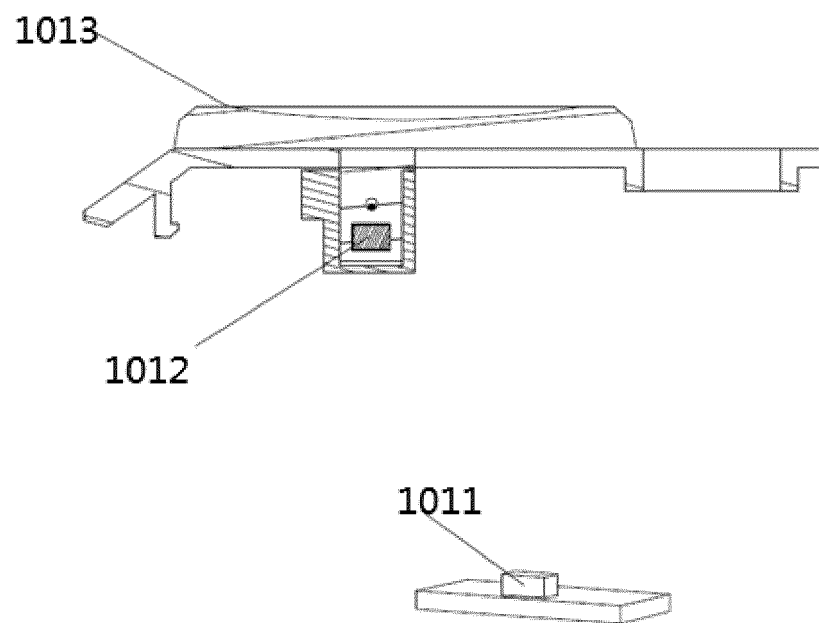


FIG. 6

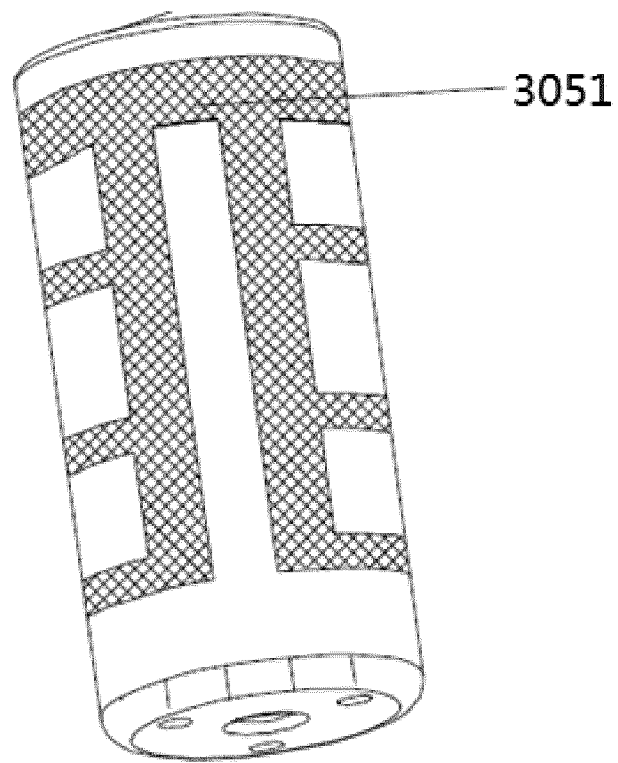


FIG. 7

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/092289

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)

A24F47

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; CNKI; VEN; WOTXT; USTXT; EPTXT: 香烟, 烟支, 烟弹, 雾化, 气流, 传感, 感应, 滑盖, 发热, 加热, cigarette, bomb, atomiz+, flow, sens+, slid+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 108713798 A (CHINA TOBACCO YUNNAN INDUSTRIAL LLC) 30 October 2018 (2018-10-30) claims 1-7	1-7
Y	CN 207040892 U (SHENZHEN FIRSTUNION TECHNOLOGY CO., LTD.) 27 February 2018 (2018-02-27) description, paragraphs [0021], [0022], [0030] and [0037]-[0040], and figures 1 and 2	1-6
Y	CN 103989252 A (SHANGHAI TOBACCO GROUP CO., LTD.) 20 August 2014 (2014-08-20) description, paragraph [0052]	1-6
Y	CN 107411179 A (NANTONG CIGARETTE FILTER CO., LTD.) 01 December 2017 (2017-12-01) description, paragraphs [0033] and [0034], and figures 1 and 2	3-6
A	CN 107836751 A (CHINA TOBACCO HUNAN INDUSTRIAL CO., LTD.) 27 March 2018 (2018-03-27) entire document	1-7



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

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“&” document member of the same patent family

Date of the actual completion of the international search

25 July 2019

Date of mailing of the international search report

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Name and mailing address of the ISA/CN

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Facsimile No. (86-10)62019451

Telephone No.

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2019/092289

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
CN	108713798	A	30 October 2018	CN	208550037	U	01 March 2019
CN	207040892	U	27 February 2018	None			
CN	103989252	A	20 August 2014	CN	103989252	B	16 June 2017
CN	107411179	A	01 December 2017	WO	2019041481	A1	07 March 2019
CN	107836751	A	27 March 2018	None			

Form PCT/ISA/210 (patent family annex) (January 2015)