(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 981 271 A1**

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
13.04.2022 Bulletin 2022/15

(21) Application number: **19937071.9**

(22) Date of filing: **08.07.2019**

(51) International Patent Classification (IPC):
A24F 47/00 *(2020.01)*

(52) Cooperative Patent Classification (CPC):
A24F 47/00

(86) International application number:
PCT/CN2019/095121

(87) International publication number:
WO 2021/003641 (14.01.2021 Gazette 2021/02)

(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: **O-Net Automation Technology (Shenzhen) Limited**
Shenzhen, Guangdong 518118 (CN)

(72) Inventors:
- **ZHOU, Bo**
  Shenzhen, Guangdong 518118 (CN)
- **GUO, Meiling**
  Shenzhen, Guangdong 518118 (CN)
- **MAO, Aimin**
  Shenzhen, Guangdong 518118 (CN)
- **HUANG, Huihua**
  Shenzhen, Guangdong 518118 (CN)

(74) Representative: **Westphal, Mussgnug & Partner, Patentanwälte mbB**
Werinherstraße 79
81541 München (DE)

(54) **ELECTRONIC CIGARETTE AND AIRFLOW SWITCH BRACKET, AIRFLOW SWITCH ASSEMBLY AND POWER SUPPLY APPARATUS THEREOF**

(57) Disclosed are an electronic cigarette and its airflow switch bracket, airflow switch assembly and power supply device. The airflow switch bracket includes a base, a bottom surface of the base being provided with a groove for accommodating an airflow switch, the groove extending from the bottom surface of the base toward a top surface of the base so that a thin-walled layer sealed on the groove is formed on the top surface of the base. The thin-walled layer is deformable when an air flow passes by, so that a negative pressure is generated in a space between the groove and the airflow switch to control the on/off of the airflow switch. The airflow switch bracket of the invention adopts a thin-walled layer to replace the arrangement of through holes, and thus the airflow switch bracket is configured as a closed bracket. In the electronic cigarette, the thin-walled layer can be deformed when the airflow passes by, thereby controlling the on/off of the airflow switch. It can effectively prevent tobacco juice from leaking to the airflow switch or contaminating the adapter board or a battery, thereby effectively increasing the service life and safety performance of the electronic cigarette.

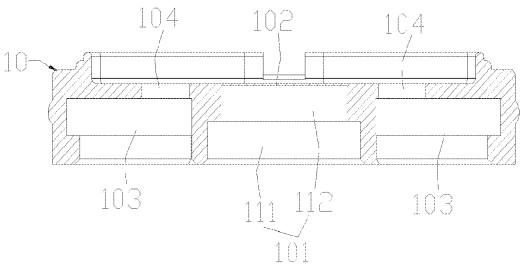

Fig. 2

EP 3 981 271 A1

Description

FIELD

[0001] The invention relates to the technical field of electronic cigarettes, and in particular to an electronic cigarette and an airflow switch bracket, an airflow switch assembly and a power supply device thereof.

BACKGROUND

[0002] In structure, an electronic cigarette roughly includes a power supply device, an atomization device and a suction nozzle. The power supply device is provided with an airflow switch assembly, and an airflow switch bracket is arranged around the airflow switch assembly to fix the airflow switch assembly. The airflow switch bracket is provided with a through hole as an airflow channel. The airflow switch assembly is embedded in the airflow channel of the airflow switch bracket. The electronic cigarette controls the start and stop of the power supply device and the atomization device through the airflow switch assembly.

[0003] At present, the airflow switch brackets of the existing electronic cigarettes are provided with through holes as airflow channels to generate pressure differences and activate the airflow switch. The condensate or liquid leakage generated by the atomization device during the working process will be conducted to the airflow switch assembly through the airflow channel, which easily causes damage to the airflow switch assembly or contaminates a PCBA board or a battery, thereby causing the failure of the electronic cigarette in normal use or even causing the battery to short-circuit and spontaneously ignite.

SUMMARY

[0004] The technical problem to be solved by the invention is to provide a high-safety closed airflow switch bracket of an electronic cigarette, as well as an airflow switch assembly, power supply device and electronic cigarette having the airflow switch bracket.

[0005] The technical solution adopted by the invention to solve its technical problem is to provide an airflow switch bracket of an electronic cigarette, including a base, a bottom surface of the base being provided with a groove for accommodating an airflow switch, the groove extending from the bottom surface of the base to a top surface of the base so that a thin-walled layer sealed on the groove is formed on the top surface of the base.

[0006] The thin-walled layer being deformed when an air flow passes by, so that a negative pressure is generated in a space between the groove and the airflow switch to control the on/off of the airflow switch.

[0007] Preferably, an outer circumference of the base is circular, and the groove and the thin-walled layer are also circular, respectively.

[0008] Preferably, the bottom surface of the base is further provided with two electrode slots located on two sides of the groove and isolated from the groove, the top surface of the base is provided with two electrode holes, the two electrode holes are located on two sides of the thin-walled layer and respectively come into communication with the corresponding electrode slots.

[0009] Preferably, the thin-walled layer is 0.05 ± 0.02 mm thick.

[0010] Preferably, the groove includes a first groove portion and a second groove portion that communicate with each other, the first groove portion being configured to accommodate the airflow switch therein, the second groove portion being configured to space the airflow switch from the thin-walled layer; the second groove portion is located between the first groove portion and the thin-walled layer and an outer circumferential size of the second groove portion is smaller than an outer circumferential size of the first groove portion.

[0011] The invention further provides an airflow switch assembly, including an adapter board, an airflow switch, and the airflow switch bracket described in any one of the above, the airflow switch being connected to the adapter board and accommodated in the groove in the base of the airflow switch bracket, an outer circumference of the airflow switch being in a sealing fit with an inner circumference of the groove.

[0012] Preferably, the airflow switch assembly further includes two electrodes connected to the adapter board, and the two electrodes penetrate into electrode slots of the base, with their tops going out of electrode holes in communication with the electrode slots.

[0013] The invention further provides a power supply device of an electronic cigarette, including the airflow switch bracket described in any one of the above or the airflow switch assembly described in any one of the above.

[0014] The invention also provides an electronic cigarette, comprising a power supply device and an atomization device connected to each other, and a suction nozzle fitted on an end of the atomization device away from the power supply device. The power supply device includes the airflow switch assembly described in any one of the above, and the electrodes of the airflow switch assembly are electrically connected with conductors of the atomization device.

[0015] Preferably, an air inlet is arranged at a side of the atomization device or at a junction between the atomization device and the power supply device. The atomization device is provided therein with an airflow channel communicating the air inlet and the suction nozzle. When an air flow entering the atomization device through the air inlet passes over the thin-walled layer of the airflow switch assembly, the thin-walled layer is deformed and then a negative pressure is generated in the airflow switch assembly to control the on/off of the airflow switch.

[0016] The airflow switch bracket of the invention adopts a thin-walled layer to replace the arrangement of

through holes, and thus the airflow switch bracket is configured as a closed bracket. In the electronic cigarette, the thin-walled layer can be deformed when the airflow passes by, thereby controlling the on/off of the airflow switch. It can effectively prevent tobacco juice from leaking to the airflow switch or contaminating the adapter board or a battery, thereby effectively increasing the service life and safety performance of the electronic cigarette.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] The invention will be further described with reference to the accompanying drawings and specific embodiments. In the drawings,

FIG. 1 is a three-dimensional schematic structural diagram of an airflow switch bracket of a first embodiment of the invention;

FIG. 2 is a schematic cross-sectional structural diagram of the airflow switch bracket of the first embodiment of the invention;

FIG. 3 is a schematic cross-sectional structural diagram of an airflow switch bracket according to a second embodiment of the invention;

FIG. 4 is a schematic structural diagram of an electronic cigarette according to an embodiment of the invention; and

FIG. 5 is a schematic cross-sectional structural diagram of the electronic cigarette shown in FIG. 4.

DESCRIPTION OF THE EMBODIMENTS

[0018] In order to have a clearer understanding of the technical features, objectives and effects of the invention, the specific embodiments of the invention will now be described in detail with reference to the accompanying drawings.

[0019] As shown in FIGS. 1 and 2, the airflow switch bracket of an electronic cigarette according to a first embodiment of the invention includes a base 10. In the electronic cigarette, a side of the base 10 facing a suction nozzle is defined as a top surface, and its opposite side is defined as a bottom surface. The bottom surface of the base 10 is provided with a groove 101 for accommodating and positioning the airflow switch.

[0020] The groove 101 extends from the bottom surface of the base 10 to the top surface of the base 10, without penetrating the top surface of the base 10, so that a thin-walled layer 102 sealed on the groove 101 is formed on the top surface of the base 10. Viewed from the base 10, an opening of the groove 101 faces downward, and the thin-walled layer 102 also constitutes a top end of the groove 101.

[0021] The thin-walled layer 102 can be integrally molded with the base 10 as an integral structure. The thickness of the thin-walled layer 102 is smaller than that of other parts of the base 10, and the thin-walled layer 102 can be as thin as being close to or equal to the thickness of a thin film, so that the thin-walled layer 102 can be deformed and restored.

[0022] The thin-walled layer 102 may be 0.05 ± 0.02 mm thick.

[0023] In the electronic cigarette, the thin-walled layer 102 can be deformed when an air flow passes by, and then a negative pressure is generated in space between the groove 101 and the airflow switch so as to control the on/off of the airflow switch. As a result, there is no need to provide through holes for the airflow to pass through, and it also eliminates the contamination problems caused by liquids such as tobacco juice leaking from the through hole to the airflow switch and a power supply device.

[0024] The groove 101 may further include a first groove portion 111 and a second groove portion 112 that communicates with each other. The airflow switch is mainly accommodated in the first groove portion 111, and when the airflow switch is accommodated in the first groove portion 111, an outer circumference of the airflow switch is in sealed fit with an inner circumference of the first groove portion 111. The second groove portion 112 is located between the first groove portion 111 and the thin-walled layer 102 and configured to space the airflow switch from the thin-walled layer 102. Moreover, the second groove portion 112 can produce a negative pressure when the airflow passes through the thin-walled layer 102, and then the airflow switch can be turned on or off.

[0025] In this embodiment, an outer circumferential size of the second groove portion 112 is smaller than an outer circumferential size of the first groove portion 111. For example, for a circular groove 101, a diameter of the first groove portion 111 is greater than that of the second groove portion 112, a stepped surface is formed at a junction of the first groove portion 111 and the second groove portion 112, and the top of the airflow switch can abut against the stepped surface.

[0026] In this embodiment, the bottom surface of the base 10 is further provided with two electrode slots 103 for accommodating electrodes. The two electrode slots 103 are located on two sides of the groove 101 and are isolated from the groove 101 and do not communicate with each other. The top surface of the base 10 is provided with two electrode holes 104 for ends of the electrodes pass through the base 10. The two electrode holes 104 arranged on two sides of the thin-walled layer 102 are respectively located above the two electrode slots 103 and communication with the corresponding electrode slots 103.

[0027] In the electronic cigarette, the airflow switch bracket is installed in the power supply device. As shown in FIG. 1, in this embodiment, the base 10 is of a rectangular structure as a whole, and its two long sides are arc-shaped. The base 10 of this shape is suitable for a flat (non-cylindrical) power supply device.

[0028] In addition, at least one convex ring 105 may be provided on an outer circumferential surface of the base 10 to tightly fit an inner wall of a housing of the power supply device or the bracket to thereby achieve fixing.

[0029] As shown in FIG. 3, the airflow switch bracket of an electronic cigarette according to a second embodiment of the invention includes a base 20. In the electronic cigarette, a side of the base 20 facing a suction nozzle is defined as a top surface, and its opposite side is defined as a bottom surface. The bottom surface of the base 20 is provided with a groove 201 for accommodating and positioning the airflow switch.

[0030] The groove 201 extends from the bottom surface of the base 20 to the top surface of the base 20, without penetrating the top surface of the base 20, so that a thin-walled layer 202 sealed on the groove 201 is formed on the top surface of the base 20. Viewed from the base 20, an opening of the groove 201 faces downward, and the thin-walled layer 202 also constitutes a top end of the groove 201.

[0031] The thin-walled layer 202 can be integrally molded with the base 20 as an integral structure. The thickness of the thin-walled layer 102 is smaller than that of other parts of the base 20, and the thin-walled layer 102 can be as thin as being close to or equal to the thickness of a thin film, so that the thin-walled layer can be deformed and restored.

[0032] The thin-walled layer 202 may be 0.05 ± 0.02 mm thick.

[0033] In this embodiment, the outer circumference of the base 20 is circular, and the groove 201 and the thin-walled layer 202 are also circular, respectively. The base 20 of this embodiment is suitable for a cylindrical power supply device.

[0034] As shown in FIGS. 4 and 5, the electronic cigarette according to an embodiment of the invention includes a power supply device 1 and an atomization device 2 connected to each other, a suction nozzle 3 fitted on an end of the atomization device 2 away from the power supply device 1. The electronic cigarette further includes a housing 4, the power supply device 1 and the atomizing device 2 are assembled in the housing 3, and the suction nozzle 3 is connected with the housing 4 by a peripheral edge of its end.

[0035] The power supply device 1 includes a frame-shaped bracket 11, a battery 12 arranged in the bracket 11, an airflow switch assembly 13, and a control assembly 14. The airflow switch assembly 13 and the control assembly 14 are respectively located at opposite ends of the battery 12 and are electrically connected to the battery 12. The airflow switch assembly 13 is located at the end of the battery 12 facing the atomization device 1 for connecting and conducting with the atomization device 1; the control assembly 14 is located at the other end of the battery 12 away from the atomization device 2 and at the bottom of the electronic cigarette.

[0036] The airflow switch assembly 13 includes an adapter board (PCBA board) 131, an airflow switch 132, and an airflow switch bracket 133; the adapter board 131 is electrically connected to the battery 12. The air switch bracket 133 here may be of the same structure as the air switch bracket of the first embodiment or the second embodiment described above.

[0037] In this embodiment, the airflow switch assembly 13 is described by taking the airflow switch bracket of the first embodiment shown in FIGS. 1 and 2 as an example: the airflow switch 132 is connected to the adapter board 131 and is accommodated in the groove 101 of the base 10 of the airflow switch bracket 133, the outer circumference of the airflow switch 132 is in a sealing fit with the inner circumference of the groove 101.

[0038] The airflow switch assembly 13 further includes two electrodes 134 connected to the adapter board 131, the two electrodes 134 penetrate into the electrode slots 102 of the base 10, with their top ends going out of the electrode holes 104 in communication with the electrode slots 103. The top ends of the electrodes 134 going out of the electrode holes 104 are configured to be electrically connected with conductors 25 of the atomization device 2 to achieve conduction between the atomization device 2 and the power supply device 1. The electrodes 134 can be configured as elastic electrodes 134, which can maintain contact and electrical connection with the conductors 25.

[0039] The atomization device 2 can be connected to the power supply device 1 by means of a buckle or magnetic attraction.

[0040] It is feasible to use the atomization device of the prior art as the atomization device 2 here. For example, the atomization device 2 may include a shell 21, an air duct 22 arranged in the shell 21, an atomizing seat 23 arranged at one end of the shell 21, a heating component 24 arranged on the atomization seat 23, the conductors 25 and so on. The shell 21 is provided therein with a storage chamber 211 for storing tobacco juice, the air duct 22 is inserted in the middle of the shell 21, and the storage chamber 211 is located at the periphery of the air duct 22.

[0041] An air outlet is arranged at the other end of the shell 21 to communicate with an internal channel of the air duct 22. An air inlet is arranged at a side of the shell 21 of the atomization device or at a junction between the atomization device 2 and the power supply device 1. The air inlet extends through the housing 4 to the outside, and communicates with the outside air. The air inlet, the internal channel of the air duct 22, the air outlet and the suction nozzle 3 come into communication in sequence to form an airflow channel. The airflow channel passes over the thin-walled layer 102 above the airflow switch bracket 133. When an air flow entering the atomization device 2 through the air inlet passes over the thin-walled layer 102 of the airflow switch assembly 13, the thin-walled layer 102 is deformed, and then a negative pressure is generated in the airflow switch assembly 13 to control the on/off of the airflow switch 132.

[0042] With reference to FIGS. 2 and 5, in the case of smoking with the electronic cigarette of the invention, the airflow enters the airflow channel from the air inlet and passes through the bottom of the atomization device 2 and the surface of the thin-walled layer 102. As a result, the thin-walled layer 102 is deformed and a negative pressure is generated to activate the airflow switch 132. The power supply device 1 supplies power to the atomization device 2, and the heating component 24 is energized and generates heat to atomize the tobacco juice into smoke. The smoke is sucked into the mouth of a user from the suction nozzle along the airflow channel. When the user stops smoking, there is no air flow across the surface of the thin-walled layer 102, the thin-walled layer 102 returns to its original shape, the pressure of air between the thin-walled layer 102 and the airflow switch 132 returns to its original level, the airflow switch 132 is turned off, and the power supply device 1 stops supplying power to the atomization device 2.

[0043] The electronic cigarette of the present invention has no holes in the thin-walled layer 102, so it can effectively prevent the condensate or liquid leakage generated by the atomization device 2 during the working process from being conducted to the airflow switch assembly 13, thereby avoiding contaminating the adapter board 131 or the battery 12, and increasing the service life and safety performance of the electronic cigarette.

[0044] The above description is set forth only as preferred embodiments of the invention and is not intended to limit the scope of the invention. Any equivalent structure or equivalent process transformation, made based on the contents of the description of the invention and the accompanying drawings and directly or indirectly used in other related technical fields, is likewise included within the scope of the patent protection of the invention.

Claims

1. An airflow switch bracket of an electronic cigarette, **characterized by** comprising a base, a bottom surface of the base being provided with a groove for accommodating an airflow switch, the groove extending from the bottom surface of the base toward a top surface of the base so that a thin-walled layer sealed on the groove is formed on the top surface of the base;
   the thin-walled layer being deformable when an air flow passes by, so that a negative pressure is generated in a space between the groove and the airflow switch to control the on/off of the airflow switch.

2. The airflow switch bracket according to Claim 1, **characterized in that** an outer circumference of the base is circular, and the groove and the thin-walled layer are also circular, respectively.

3. The airflow switch bracket according to Claim 1, **characterized in that** the bottom surface of the base is further provided with two electrode slots located on two sides of the groove and isolated from the groove, the top surface of the base is provided with two electrode holes, the two electrode holes are located on two sides of the thin-walled layer and in communication with the corresponding electrode slots respectively.

4. The airflow switch bracket according to any of Claims 1 to 3, **characterized in that** the thin-walled layer has a thickness of 0.05 ± 0.02 mm.

5. The airflow switch bracket according to any of Claims 1 to 3, **characterized in that** the groove comprises a first groove portion configured to accommodate the airflow switch therein and a second groove portion configured to space the airflow switch from the thin-walled layer, the first groove portion is in communication with the second groove portion, the second groove portion is located between the first groove portion and the thin-walled layer with an outer circumferential size of the second groove portion being less than an outer circumferential size of the first groove portion.

6. An airflow switch assembly, **characterized by** comprising an adapter board, an airflow switch, and the airflow switch bracket according to any of Claims 1 to 5, the airflow switch being connected to the adapter board and accommodated in the groove in the base of the airflow switch bracket, an outer circumference of the airflow switch being in a sealing fit with an inner circumference of the groove.

7. The airflow switch assembly according to Claim 6, **characterized in that** the airflow switch assembly further comprises two electrodes connected to the adapter board, the two electrodes penetrating into the electrode slots of the base, with their top ends going out of the electrode holes in communication with the electrode slots.

8. A power supply device of an electronic cigarette, **characterized by** comprising the airflow switch bracket according to any of Claims 1 to 5 or the airflow switch assembly according to any of Claims 6 to 7.

9. An electronic cigarette, **characterized by** comprising a power supply device and an atomization device connected to each other, and a suction nozzle fitted on an end of the atomization device away from the power supply device, wherein the power supply device comprises the airflow switch assembly according to any of Claims 6 to 7, and the electrodes of the airflow switch assembly are electrically connected with conductors of the atomization device.

10. The electronic cigarette according to Claim 9, wherein an air inlet is arranged at a side of the atomization device or at a junction between the atomization device and the power supply device; the atomization device is provided therein with an airflow channel communicating the air inlet and the suction nozzle; when an air flow entering the atomization device through the air inlet passes over the thin-walled layer of the airflow switch assembly, the thin-walled layer is deformed so that a negative pressure is generated in the airflow switch assembly to control the on/off of the airflow switch.

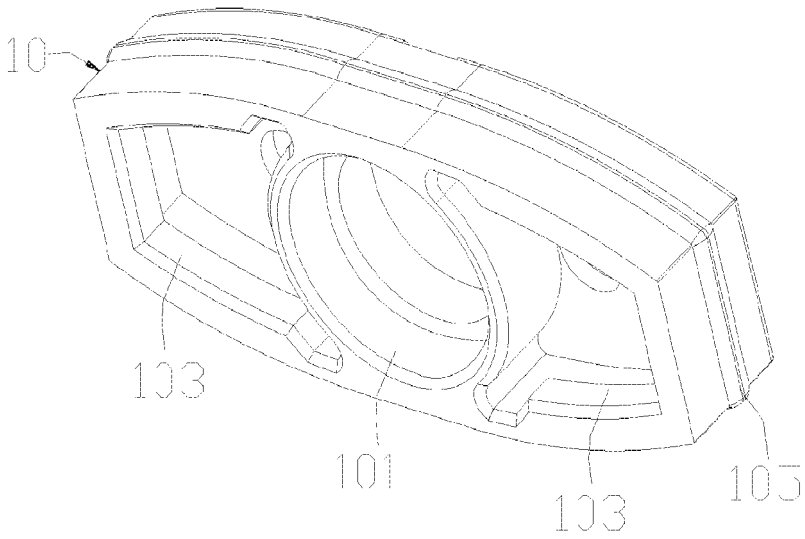

Fig. 1

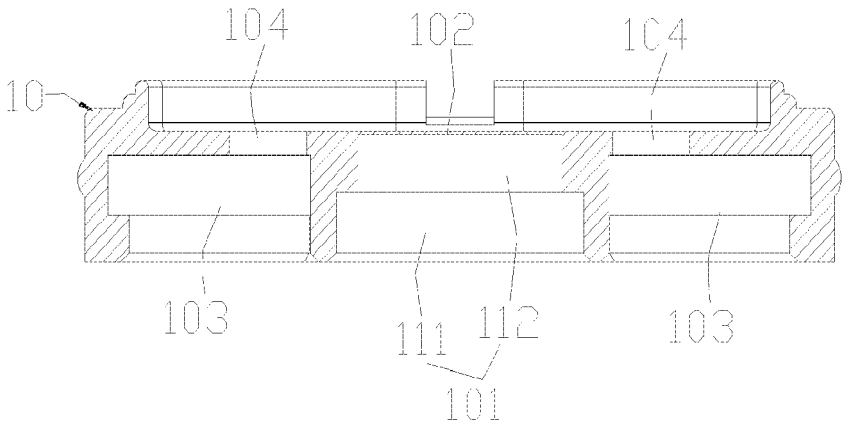

Fig. 2

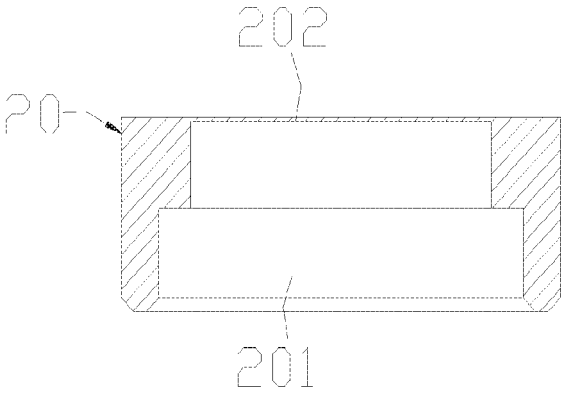

Fig. 3

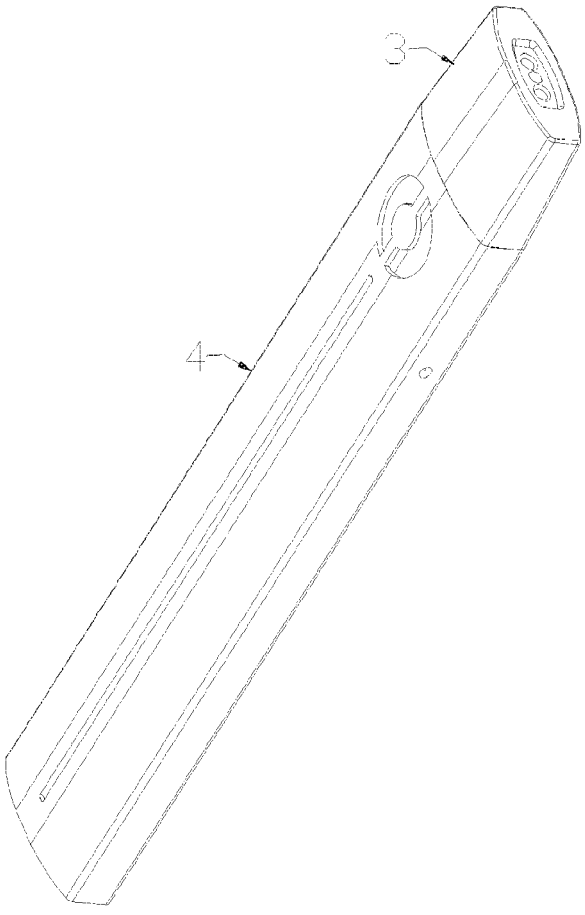

Fig. 4

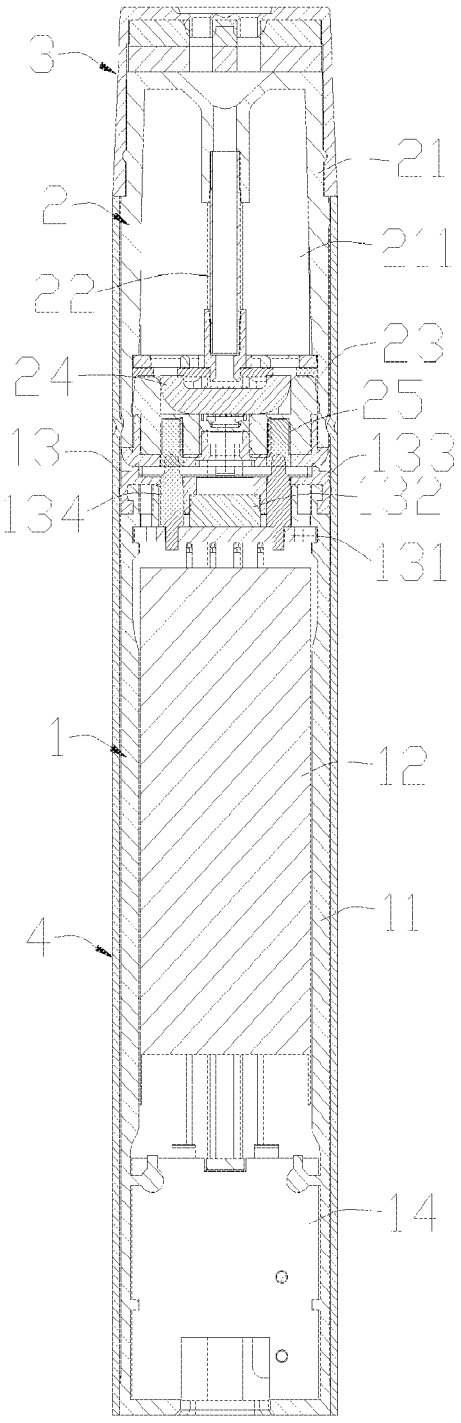

Fig. 5

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2019/095121

A. CLASSIFICATION OF SUBJECT MATTER

A24F 47/00(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)

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)

CNPAT, CNKI, WPI, EPODOC: 气动, 气流, 开关, 支架, 基座, 底座, 薄, 壁, 板, 膜, 隔断, 阻断, 气孔, 气道, 通道, gas, air, pneumatic, switch+, support, base, film?, membrane?, diaphragm

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CN 201104488 Y (SHENZHEN KANGER TECHNOLOGY CO., LTD.) 27 August 2008 (2008-08-27) description, page 4, paragraph 3 (from the bottom) to page 6, paragraph 2, figures 1-4	1-10
Y	CN 108420125 A (SHENZHEN LANYIN TECHNOLOGY CO., LTD.) 21 August 2018 (2018-08-21) description, paragraphs [0024]-[0034], and figures 1-3	1-10
A	CN 209031257 U (SHENZHEN SMOORE TECHNOLOGY LIMITED) 28 June 2019 (2019-06-28) entire document	1-10
A	CN 108851252 A (SHENZHEN MASON VAP TECHNOLOGY CO., LTD.) 23 November 2018 (2018-11-23) entire document	1-10
A	CN 206482026 U (SHENZHEN GOLDREAMS TECHNOLOGY CO., LTD.) 12 September 2017 (2017-09-12) 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
"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	Date of mailing of the international search report
24 March 2020	**08 April 2020**
Name and mailing address of the ISA/CN **China National Intellectual Property Administration (ISA/CN)** **No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088** **China**	Authorized officer
Facsimile No. **(86-10)62019451**	Telephone No.

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

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2019/095121

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 108851230 A (SHENZHEN KANGER TECHNOLOGY CO., LTD.) 23 November 2018 (2018-11-23) entire document	1-10
A	CN 105455195 A (SHENZHEN SMOORE TECHNOLOGY LIMITED) 06 April 2016 (2016-04-06) entire document	1-10
A	CN 201075358 Y (LI, Yonghai) 18 June 2008 (2008-06-18) entire document	1-10
A	CN 201490997 U (DONGGUAN TRANSOUND ELECTRONICS CO., LTD.) 26 May 2010 (2010-05-26) entire document	1-10
A	US 2018064171 A1 (VMR PRODUCTS L.L.C.) 08 March 2018 (2018-03-08) entire document	1-10

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

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2019/095121

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 201104488 Y	27 August 2008	None	
CN 108420125 A	21 August 2018	None	
CN 209031257 U	28 June 2019	None	
CN 108851252 A	23 November 2018	None	
CN 206482026 U	12 September 2017	None	
CN 108851230 A	23 November 2018	US 2018325171 A1	15 November 2018
CN 105455195 A	06 April 2016	CN 105455195 B	08 June 2018
CN 201075358 Y	18 June 2008	JP 3145256 U	02 October 2008
CN 201490997 U	26 May 2010	None	
US 2018064171 A1	08 March 2018	EP 3068244 A1	21 September 2016
		WO 2015073975 A1	21 May 2015
		US 9781953 B2	10 October 2017
		US 2015136155 A1	21 May 2015

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