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(54) **Atomizing device and electronic cigarette having same**

(57) An atomizing device of an electronic cigarette includes an atomizing sleeve, an air pipe located in the atomizing sleeve, a heating assembly arranged on the air pipe, a heating assembly fixing base fixing and supporting the heating assembly, a metallic sleeve supporting the heating assembly fixing base, and a sealing cover. The sealing cover and the heating assembly fixing base are located at opposite ends of the air pipe, the atomizing sleeve, the air pipe, the sealing cover, the heating assembly fixing base and the metallic sleeve cooperatively define a sealed tobacco solution reserving space without a reservoir cotton received therein. An electronic cigarette using the atomizing device is also provided.

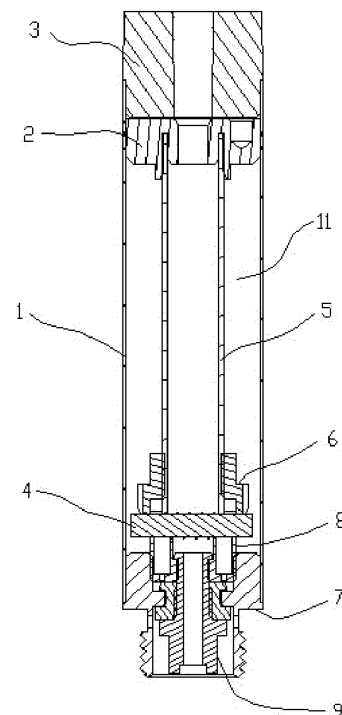


FIG.1

Description

BACKGROUND

1. Technical Field

[0001] The present invention relates to electronic cigarettes, and particularly to an atomizing device and an electronic cigarette having the atomizing device.

2. Description of Related Art

[0002] Atomizing devices are key components of electronic cigarettes. A typical atomizing device includes a reservoir cotton, a tobacco solution reserved in the reservoir cotton, and a heating assembly for heating and atomizing the tobacco solution. Then the atomized tobacco solution can be sucked by a user of the electronic cigarette.

[0003] However, as the reservoir cotton is immersed by the tobacco solution, after a long time, the reservoir cotton may bring an abnormal smell, then the taste of the tobacco solution may be changed.

[0004] What is needed, therefore, is an atomizing device and an electronic cigarette which can overcome the above shortcomings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] Many aspects of the present atomizing device and electronic cigarette can be better understood with reference to the following drawings. The components in the drawings are not necessarily drawn to scale, the emphasis instead being placed upon clearly illustrating the principles of the present atomizing device and electronic cigarette. Moreover, in the drawings, like reference numerals designate corresponding parts throughout the several views.

[0006] FIG. 1 is a cross sectional view of an atomizing device of an electronic cigarette in accordance with a first embodiment.

[0007] FIG. 2 is similar to FIG. 1, but taken along a perpendicular line relative to FIG. 1.

[0008] FIG. 3 is an exploded view of the atomizing device of FIG. 1.

[0009] FIG. 4 is an isometric schematic view of a tobacco solution obstructing ring shown in FIG. 3.

[0010] FIG. 5 is a cross sectional view of an air pipe and a sealing cover shown in FIG. 3.

[0011] FIG. 6 is an isometric schematic view of the sealing cover of FIG. 5.

[0012] FIG. 7 is an isometric schematic view of a heating assembly fixing base shown in FIG. 3.

[0013] FIG. 8 is a cross sectional view of an atomizing device of an electronic cigarette in accordance with a second embodiment.

[0014] FIG. 9 is a schematic view of an electronic cigarette in accordance with a third embodiment.

DETAILED DESCRIPTION

[0015] Embodiments of the present electronic cigarette will now be described in detail below and with references to the drawings.

[0016] Referring to FIGS. 1 and 2, an atomizing device 100 of an electronic cigarette in accordance with a first embodiment is provided. The atomizing device 100 includes an atomizing sleeve 1, an air pipe 5, a heating assembly 4 fixed on the air pipe 5, a metallic ring 7 and a nozzle 3 located respectively at two ends of the air pipe 5, a heating assembly fixing base 8 and a sealing cover 2. The heating assembly fixing base 8 is fixed on the metallic ring 7. The sealing cover 2, air pipe 5, metallic ring 7, and the heating assembly fixing base 8 are received in the atomizing sleeve 1. The sealing cover 2, air pipe 5, heating assembly fixing base 8, and the metallic ring 7 cooperatively define a sealed tobacco solution reserving space 11 without a reservoir cotton received therein.

[0017] In addition, an electrode ring 9 is fixed in the metallic ring 7, and an insulating ring 10 is located between the metallic ring 7 and the electrode ring 9. When the atomizing device 100 is electrically connected to a power source, the metallic ring 7 and the electrode ring 9 are respectively connected to a positive end and a negative end of the power source.

[0018] The heating assembly 4 includes a glass fiber core 41 and a heating coil 42 winding around the glass fiber core 41. Two ends of the heating coil 42 are connected to the electrode ring 9 and the metallic ring 7. The glass fiber core 41 can absorb the tobacco solution reserved by the tobacco solution reserving space 11, and the heating coil 42 can heat the tobacco solution absorbed by the glass fiber core 41, thereby atomizing the tobacco solution. That is, without a conventional reservoir cotton, the atomizing device 100 work well, and the taste of the tobacco solution can be constant.

[0019] Referring to FIG. 5, the sealing cover 2 has an air through hole 22 and a connecting groove 23. The connecting groove 23 surrounds the through hole 22. The air pipe 5 is inserted in the connecting groove 23, and is in communication with the through hole 22. The sealing cover 2 is arranged adjacent to the nozzle 3. The sealing cover 2 is made of a flexible material, and has a tobacco solution filling hole 21 configured for filling a tobacco solution into the tobacco solution reserving space 11 between the atomizing sleeve 1 and the air pipe 5. The tobacco solution filling hole 21 is a blind hole. In filling the tobacco solution, a needle can be used to fill the tobacco solution into the tobacco solution reserving space 11. As the tobacco solution reserving space 11 is sealed, after the tobacco solution is used, a negative pressure is formed in the tobacco solution reserving space 11, thereby the tobacco solution would not leak out through the metallic ring 7 and the electrode ring 9 even the atomizing device 100 stands upwards.

[0020] Referring to FIG. 7, the heating assembly fixing

base 8 includes a central through hole 84, a first sidewall through hole 82, a second sidewall through hole 83. Axes of the central through hole 84, first sidewall through hole 82, second sidewall through hole 83 are parallel with each other. Two ends of the heating coil 42 respectively extend through the first sidewall through hole 82 and the second sidewall through hole 83, and respectively bend at an outer wall of the heating assembly fixing base 8 and an inner wall of the central through hole 84. The electrode ring 9 is positioned in the central through hole 84.

[0021] Referring to FIG. 2 and FIG. 7, the heating assembly fixing base 8 further has an inserting hole 81 in communication with the central through hole 84. The air pipe 5 is inserted in the inserting hole 81.

[0022] Referring again to FIG. 1, a tobacco solution obstructing ring 6 is arranged on the air pipe 5 in the atomizing sleeve 1. The tobacco solution obstructing ring 6 is arranged above the heating assembly 4. Referring to FIG. 4, the tobacco solution obstructing ring 6 includes a first ring 63 and a second ring 61 in communication with the first ring 63. An inner diameter of the second ring 61 is greater than that of the first ring 63. In the present embodiment, the second ring 61 is in contact with the heating assembly 4. An outer wall of the second ring 61 has a cutout surface 62 facing toward the atomizing sleeve 1, and the cutout surface 62 is configured for controlling rate of flow of the tobacco solution.

[0023] In the present embodiment, the tobacco solution obstructing ring 6, the sealing cover 2, the nozzle 3 and the heating assembly fixing base 8 each are made of a flexible material. The flexible material can be silicon or plastic material.

[0024] Referring to FIG. 8, an atomizing device 200 of in accordance with a second embodiment is provided. The atomizing device 200 of an electronic cigarette in accordance with a second embodiment is provided. The atomizing device 200 is essentially similar to the atomizing device 100, however, the atomizing sleeve 1 has a tobacco solution obstructing structure 16 integrally formed thereon, such that the air pipe 5 does not need the tobacco solution obstructing ring 6. The tobacco solution obstructing structure 16 has a through hole surrounding the air pipe 5, and an inner wall of the through hole has a cutout surface 17 facing toward the air pipe 5.

[0025] Referring to FIG. 9, an electronic cigarette 400 in accordance with a third embodiment is provided. The electronic cigarette 400 includes an atomizing device 100 (200) and a battery assembly 300 connected to the atomizing device 100(200). The battery assembly 300 has a chargeable battery.

[0026] It is understood that the above-described embodiments are intended to illustrate rather than limit the disclosure. Variations may be made to the embodiments and methods without departing from the spirit of the disclosure. Accordingly, it is appropriate that the appended claims be construed broadly and in a manner consistent with the scope of the disclosure.

Claims

1. An atomizing device of an electronic cigarette, comprising:
 - an atomizing sleeve,
 - an air pipe located in the atomizing sleeve;
 - a heating assembly arranged on the air pipe;
 - a heating assembly fixing base fixing and supporting the heating assembly;
 - a metallic sleeve supporting the heating assembly fixing base; and
 - a sealing cover, wherein the sealing cover and the heating assembly fixing base are located at opposite ends of the air pipe, the atomizing sleeve, the air pipe, the sealing cover, the heating assembly fixing base and the metallic sleeve cooperatively define a sealed tobacco solution reserving space without a reservoir cotton received therein.
2. The atomizing device of claim 1, further comprising a tobacco solution obstructing ring arranged on the air pipe and above the heating assembly.
3. The atomizing device of claim 2, wherein the tobacco solution obstructing ring comprises a first ring and a second ring in communication with the first ring, a diameter of the second ring is greater than that of the first ring, and the second ring is in contact with the heating assembly.
4. The atomizing device of claim 3, wherein an outer wall of the second ring has a cutout surface facing toward the atomizing sleeve.
5. The atomizing device of claim 2, wherein the tobacco solution obstructing ring is made of a flexible material.
6. The atomizing device of claim 1, wherein the atomizing sleeve has a tobacco solution obstructing structure integrally formed thereon, the tobacco solution obstructing structure has a through hole surrounding the air pipe, and an end of the tobacco solution obstructing structure is in contact with the heating assembly.
7. The atomizing device of claim 6, wherein an inner wall of the tobacco solution obstructing structure has a cutout surface facing toward the air pipe.
8. The atomizing device of claim 1, wherein the sealing cover is made of a flexible material, the sealing cover has a tobacco solution filling hole, and the tobacco solution filling hole is a blind hole.
9. The atomizing device of claim 1, wherein the heating

assembly comprises a glass fiber core and a heating coil winding around the glass fiber core; the heating assembly fixing base comprises a central through hole, a first sidewall through hole and a second sidewall through hole, two ends of the heating coil respectively extend through the first sidewall through hole and the second sidewall through hole, and respectively bend at an outer wall of the heating assembly fixing base and an inner wall of the central through hole.

10. The atomizing device of claim 1, further comprising a nozzle arranged on the sealing cover and in communication with the air pipe.

11. An electronic cigarette comprising an atomizing device of claim 1, and a battery assembly connected to the atomizing device.

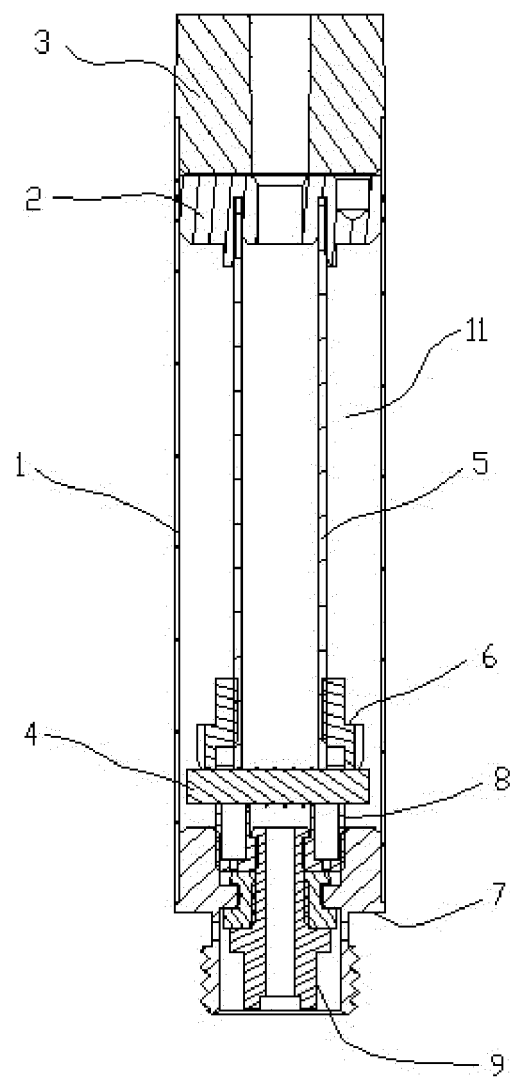


FIG.1

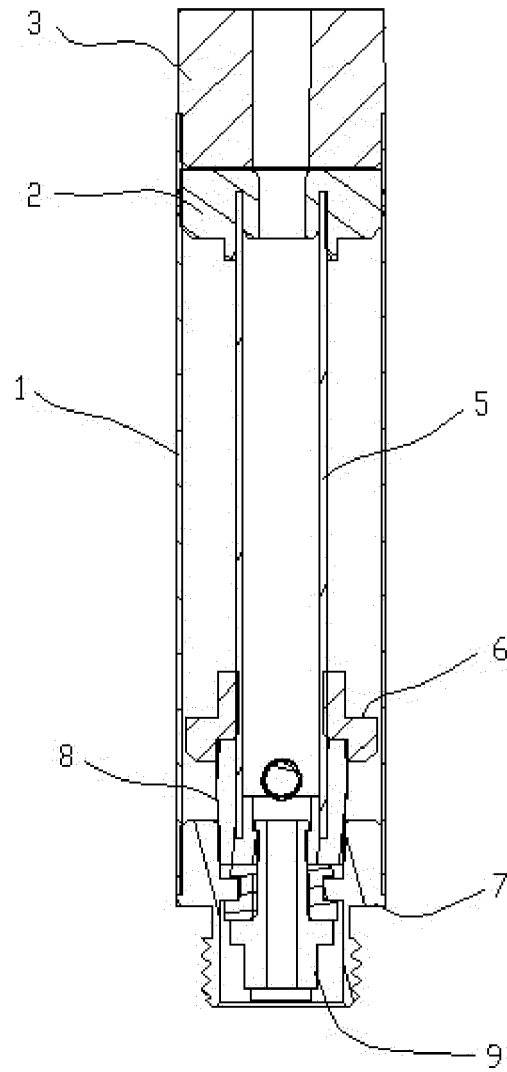


FIG.2

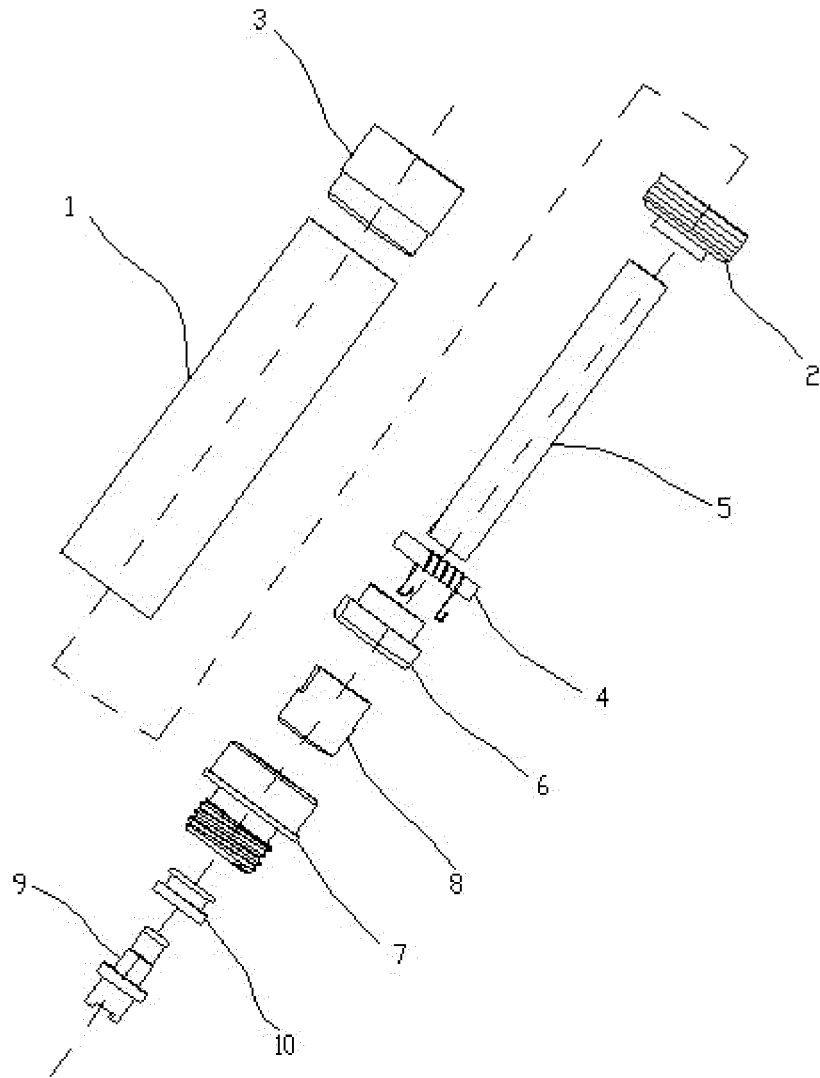


FIG.3

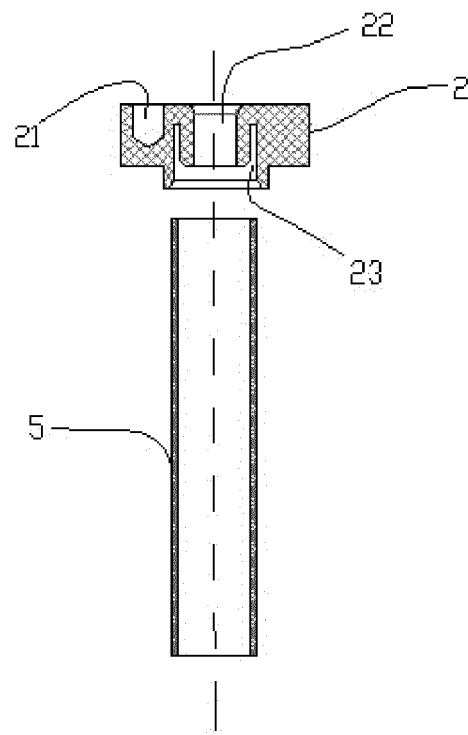


FIG.4

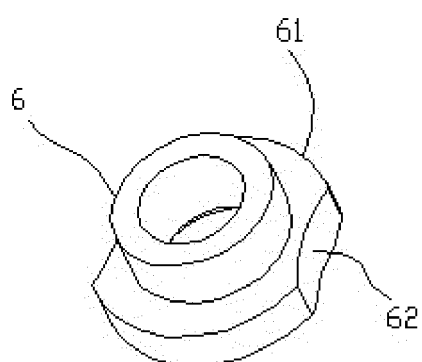


FIG.5

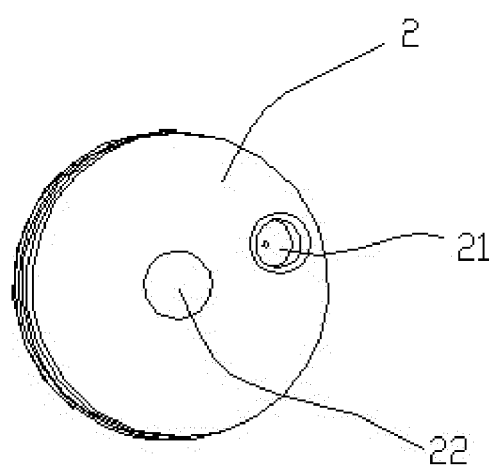


FIG.6

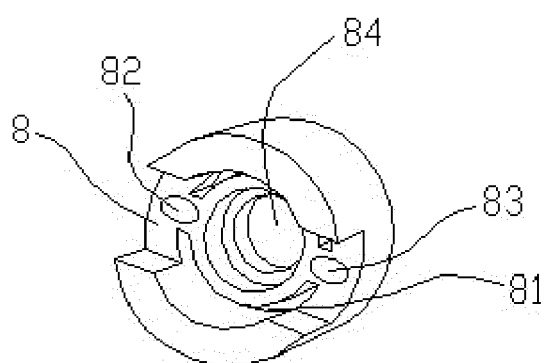


FIG. 7

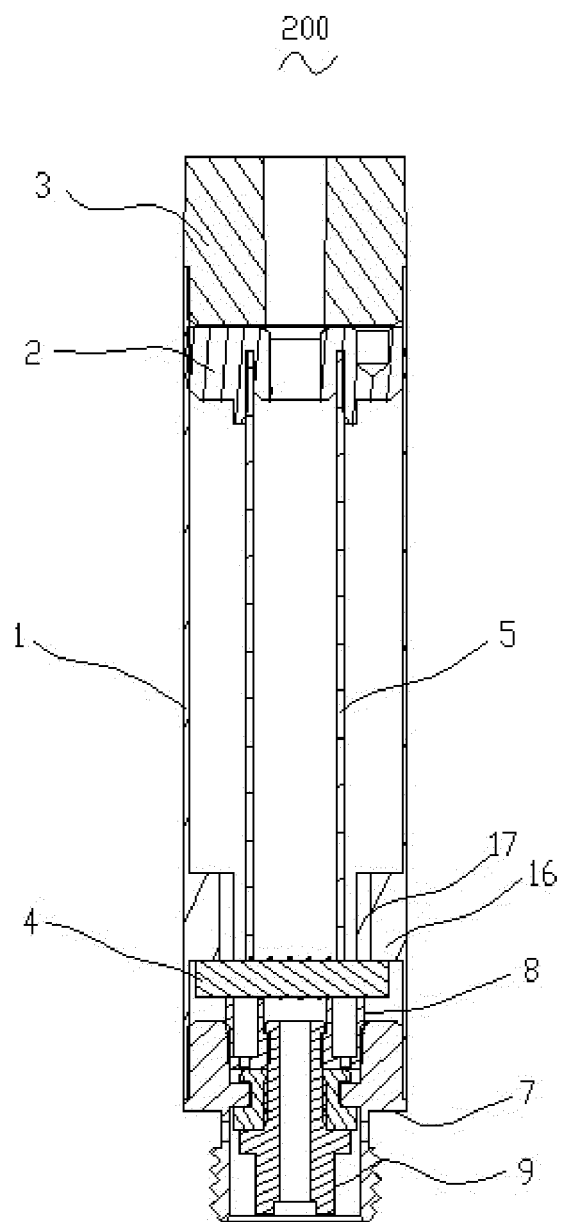


FIG.8

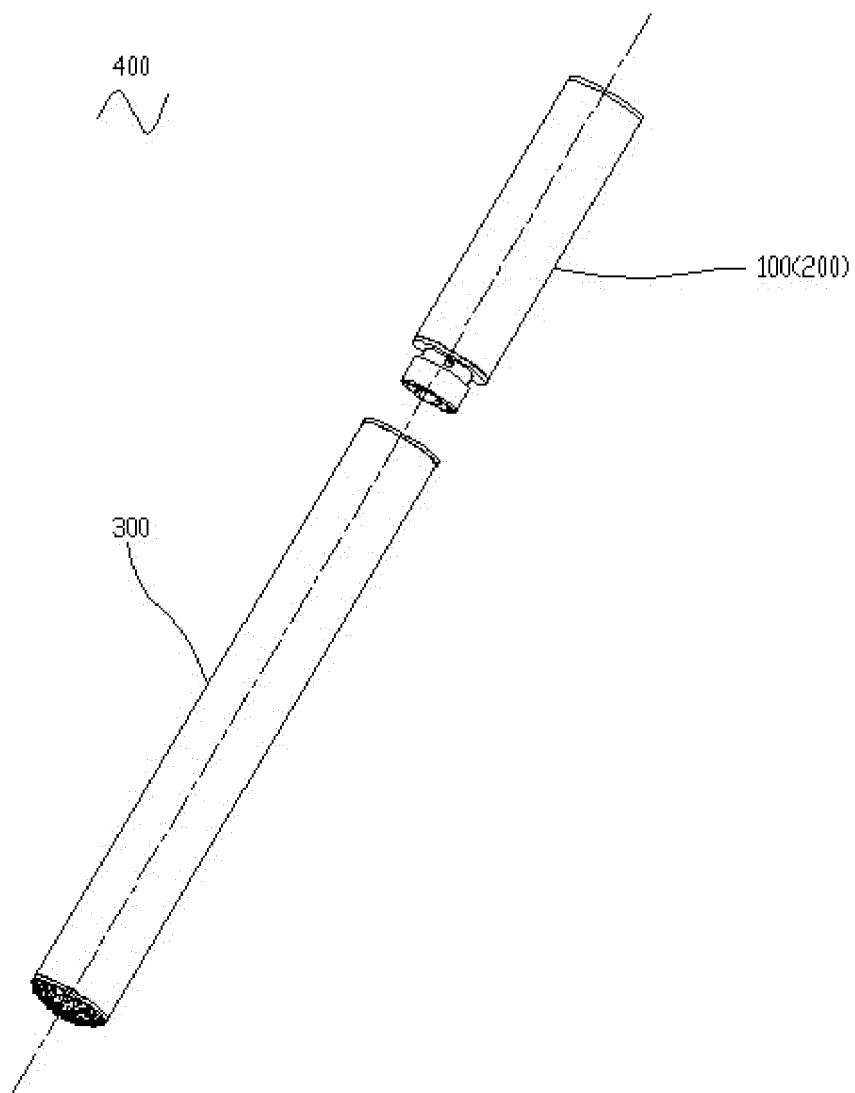


FIG.9



EUROPEAN SEARCH REPORT

Application Number
EP 13 19 0323

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2012/129787 A1 (ZHU XIAOCHUN [CN]) 4 October 2012 (2012-10-04) * abstract; figures *	1-11	INV. A24F47/00
X,P	-& US 2013/263869 A1 (ZHU XIAOCHUN [CN]) 10 October 2013 (2013-10-10) * paragraphs [0019] - [0021], [0028]; figures *	1-11	
X	US 2012/199146 A1 (MARANGOS BILL [CA]) 9 August 2012 (2012-08-09) * paragraphs [0045] - [0048]; figure 8 *	1,11	
A	US 2011/277757 A1 (TERRY NATHAN ANDREW [US] ET AL) 17 November 2011 (2011-11-17) * paragraphs [0002], [0097], [0128]; figure 7 *	1,11	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
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Place of search		Date of completion of the search	Examiner
Munich		14 March 2014	Kock, Søren
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 13 19 0323

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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14-03-2014

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