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(54) **Atomizing device, ventilation member and electronic cigarette having same**

(57) An atomizing device of an electronic cigarette without a liquid reserving member is provided. The atomizing device includes an atomizing sleeve, a support, a heating assembly, and a ventilation member fixed inside the atomizing sleeve. The ventilation member includes an air pipe and a flange formed on the air pipe. The flange includes a cavity in communication with the

air pipe, and the air pipe is fixed on the support. An annular space for containing a tobacco solution is formed between the air pipe and the atomizing sleeve. The heating assembly is placed under the support. An electronic cigarette having the atomizing device and the ventilation member is also disclosed.

Description**BACKGROUND****1. Technical Field**

[0001] The present disclosure relates to electronic cigarettes, particularly to an atomizing device having a ventilation member and an electronic cigarette having the atomizing device.

2. Description of Related Art

[0002] An electronic cigarette generally includes an atomizing device and a power source electrically connected to the atomizing device. The atomizing device includes a heating assembly atomizing a tobacco solution. Referring to FIG. 10, a typical atomizing device includes a liquid reserving member 14 wrapping around an air pipe 1' and configured for reserving a tobacco solution. During work, the heating assembly atomizes the tobacco solution absorbed from the liquid reserving member 14, then the atomized tobacco solution flows towards a user through the air pipe 1', thereby achieving a smoking effect. However, the liquid reserving member 14 will cause a chemical reaction and finally influence a taste of the tobacco solution after the liquid reserving member 14 is immersed into the tobacco solution for a long time.

[0003] Therefore, what is needed is a new kind of atomizing device without a liquid reserving member and electronic cigarette having the atomizing device.

BRIEF DESCRIPTION OF THE DRAWINGS

[0004] Many aspects of the present atomizing device, ventilation member 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, ventilation member and electronic cigarette. Moreover, in the drawings, like reference numerals designate corresponding parts throughout the several views.

FIG. 1 is a schematic cross sectional view of a ventilation member provided for an electronic cigarette in accordance with a first embodiment.

FIG. 2 is a schematic cross sectional view of a ventilation member provided for an electronic cigarette in accordance with a second embodiment.

FIG. 3 is an isometric view of the ventilation member of FIG. 2.

FIG. 4 shows a reinforcing rib added to the ventilation member of FIG. 3.

FIG. 5 shows a sealing ring added to the ventilation member of FIG. 2.

FIG. 6 is a schematic view of an atomizing device having the ventilation member of FIG. 5 in accord-

ance with a third embodiment.

FIG. 7 is a schematic view of another preferable ventilation member received in an atomizing sleeve in accordance with a forth embodiment.

FIG. 8 is a schematic view of an atomizing device having the structure of FIG. 7.

FIG. 9 is a schematic view of an electronic cigarette in accordance with a fifth embodiment.

FIG. 10 is a schematic view of a conventional atomizing device.

DETAILED DESCRIPTION

[0005] Embodiments of the present atomizing device, ventilation member and electronic cigarette having same will now be described in detail below and with references to the drawings.

[0006] Referring to FIGs. 1 and 3, a ventilation member provided for an electronic cigarette in accordance with a first embodiment is provided. The ventilation member includes an air pipe 1 and a flange 3 formed on the air pipe 1. A cavity 32 is formed inside the flange 3 and in communication with an airflow channel 2 formed inside the air pipe 1. The cavity 32 is configured to reserve and purify an atomized tobacco solution which flows from the air pipe 1. Furthermore, the ventilation member is T-shaped, and an inclined surface 4 is formed between the flange 3 and the air pipe 1 for guiding the tobacco solution flowing towards the air pipe 1, thereby preventing the user from sucking the tobacco solution during smoking. In other embodiments, the inclined surface can be a curved surface or a streamline surface.

[0007] In the present embodiment, the flange 3 and the air pipe 1 are integrally formed. In other embodiments, the flange 3 and the air pipe 1 can be preformed separately, and then connected together by cementation.

[0008] In the present embodiment, the flange 3 and the air pipe 1 are made of plastic materials. In other embodiments, they can be made of metallic materials or other materials. In addition, the flange 3 and the air pipe 1 are manufactured by injection molding.

[0009] Referring to FIG. 2, a ventilation member provided for an electronic cigarette in accordance with a second embodiment is provided. The difference between the ventilation member of the present embodiment and that of the first embodiment is that a guiding wall 31 is further provided to extend downwards from the flange 3 along a direction parallel to the air pipe 1. The guiding wall 31 increases a contacting area of the ventilation member and the atomizing sleeve 8, thus the ventilation member and the atomizing sleeve 8 can be assembled more conveniently.

[0010] Referring to FIG. 4, in the present embodiment, a reinforcing rib 7 is formed on an outer wall of the air pipe 1 and a length of the reinforcing rib 7 is shorter than that of the air pipe 1.

[0011] Referring to FIG. 5, in the present embodiment, a sealing ring 5 is arranged on an external surface of the

flange 3.

[0012] Referring to FIG. 6, an atomizing device 100 provided for an electronic cigarette in accordance with a third embodiment is provided. The atomizing device includes an atomizing sleeve 8, a mouthpiece 9, a support 11, a heating assembly 12, and a ventilation member (not shown) fixed in the atomizing sleeve 8. The ventilation member is same to the one of the first embodiment. An annular space 13 is formed between the air pipe 1 and the atomizing sleeve 8, and configured for containing a tobacco solution. The annular space 13 does not have a liquid reserving member received therein. The support 11 is ring-shaped, and has an inner space 16 defined therein. The air pipe 1 is fixed on the support 11, and a sealing cover 10 is arranged on the support 11. The heating assembly 12 is positioned under the support 11. A slot 15 is formed between an outer wall of the support 11 and an inner wall of the sleeve 8 to allow the tobacco solution to flow towards the heating assembly 12. The inner space 16 of the support 11 forms an atomizing chamber for the heating assembly 12 and is in communication with the air pipe 1.

[0013] Based on the above described assembly of the annular space 13, the support 11 and the heating assembly 12, when the user smokes at the mouthpiece 9, a negative pressure will be generated in the annular space 13 with the reduction of the tobacco solution in the annular space 13 caused by the smoke of the user. In thus situation, due to the negative pressure, the tobacco solution in the annular space 13 would not leak out when the atomizing device stands upwards.

[0014] Referring to FIG. 6 again, in the present embodiment, the ventilation member is fixed in the atomizing sleeve 8 based on interference fit between the flange 3 and the atomizing sleeve 8. Specifically, a guiding wall 31 extends downwards from the flange 3 along a direction parallel to the air pipe 1, and a sealing ring 5 is arranged at an external surface of the flange 3. The flange 3 and the air pipe 1 are both made of plastic materials. As plastic materials will be expanded after injection molding, it will be hard to ensure an interference fit between the flange 3 and the atomizing sleeve 8, therefore, the sealing ring 5 can ensure that the tobacco solution will not be leaked out.

[0015] Referring to FIGs. 7 and 8, an atomizing device 200 for an electronic cigarette in accordance with a fourth embodiment is provided. In addition to the atomizing device of the third embodiment, the atomizing device of the fourth embodiment further includes a reinforcing rib 7 arranged at an outer wall of an air pipe 1. A length of the reinforcing rib 7 is defined shorter than that of the air pipe 1 in helpful of assembling the air pipe 1 to the atomizing sleeve 8. Specifically, referring to FIG. 8, the bottom of the air pipe 1 is inserted into a sealing cover 10, and the reinforcing rib 7 is fixed on the top of the sealing cover 10.

[0016] Referring to FIG. 9, an electronic cigarette 300 in accordance with a fifth embodiment is provided. The electronic cigarette 300 includes an atomizing device

100(200) and a battery assembly 400 electrically connected to the atomizing device 100(200)

[0017] 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.

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Claims

1. An atomizing device of an electronic cigarette, comprising:

an atomizing sleeve ;
a support received in the atomizing sleeve;
a heating assembly; and
a ventilation member fixed inside the atomizing sleeve;
wherein the ventilation member comprises an air pipe and a flange formed on the air pipe, the flange comprises a cavity in communication with the air pipe, the air pipe is fixed on the support, then an annular space for containing a tobacco solution is formed between the air pipe and the atomizing sleeve,
and the heating assembly is positioned under the support.

2. The atomizing device of claim 1, wherein the support is ring-shaped, and comprises an inner space in communication with the air pipe and configured as an atomizing chamber of the heating assembly.

3. The atomizing device of claim 1, wherein a sealing cover is arranged on the support.

4. The atomizing device of claim 1, wherein a slot is formed between an outer wall of the support and an inner wall of the atomizing sleeve to allow the tobacco solution flow towards the heating assembly.

5. The atomizing device of claim 1, wherein the ventilation member is T-shaped, and a junction surface between the flange and the air pipe is an inclined surface or a curved surface.

6. The atomizing device of claim 1, wherein a reinforcing rib is fixed at an outer wall of the air pipe and a length of the reinforcing rib is shorter than that of the air pipe.

7. The atomizing device of claim 1, wherein the flange and the air pipe are integrally formed.

8. The atomizing device of claim 1, wherein the flange

and the air pipe are both made of plastic materials.

9. The atomizing device of claim 1, wherein a sealing ring is arranged on an outer wall of the flange.

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10. The atomizing device of claim 1, wherein a guiding wall extends downwards from the flange along a direction parallel to the air pipe.

11. A ventilation member of an atomizing device, comprising: an air pipe and a flange formed on the air pipe, a cavity being formed in the flange and in communication with the air pipe. 10

12. The ventilation member of claim 11, wherein the ventilation member is T-shaped and a junction surface between the flange and the air pipe is an inclined surface or a curved surface. 15

13. The ventilation member of claim 11, wherein a reinforcing rib is arranged on an outer wall of the air pipe and a length of the reinforcing rib is shorter than that of the air pipe. 20

14. The ventilation member of claim 11, wherein the flange and the air pipe are integrally formed. 25

15. The ventilation member of claim 11, wherein a guiding wall is extended downwards from the flange along a direction parallel to the air pipe. 30

16. An electronic cigarette comprising a battery assembly and an atomizing device of claim 1, the battery assembly is configured to be electrically connected to the atomizing device. 35

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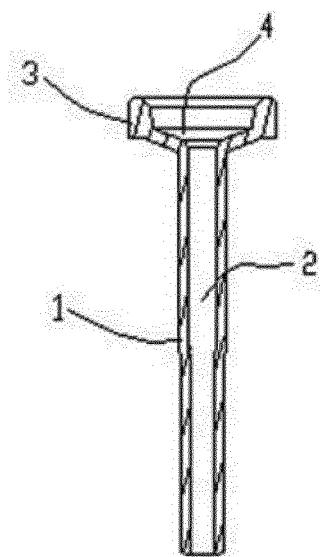


FIG. 1

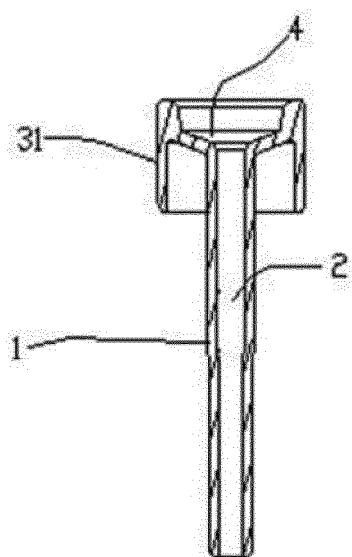


FIG. 2

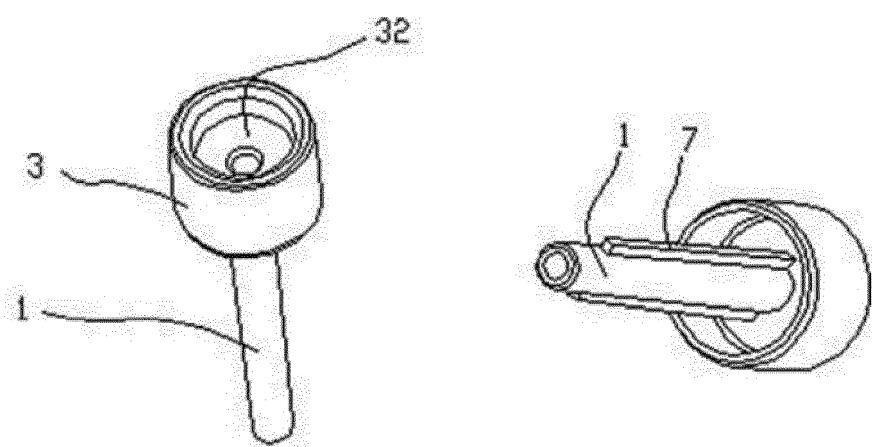


FIG. 3

FIG. 4

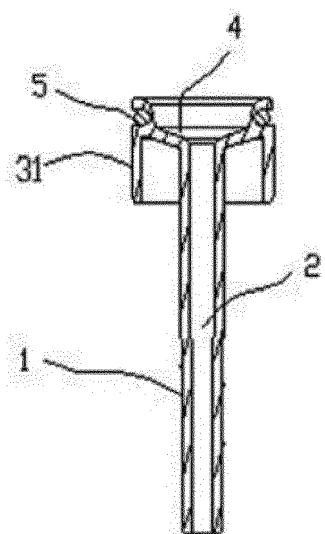


FIG. 5

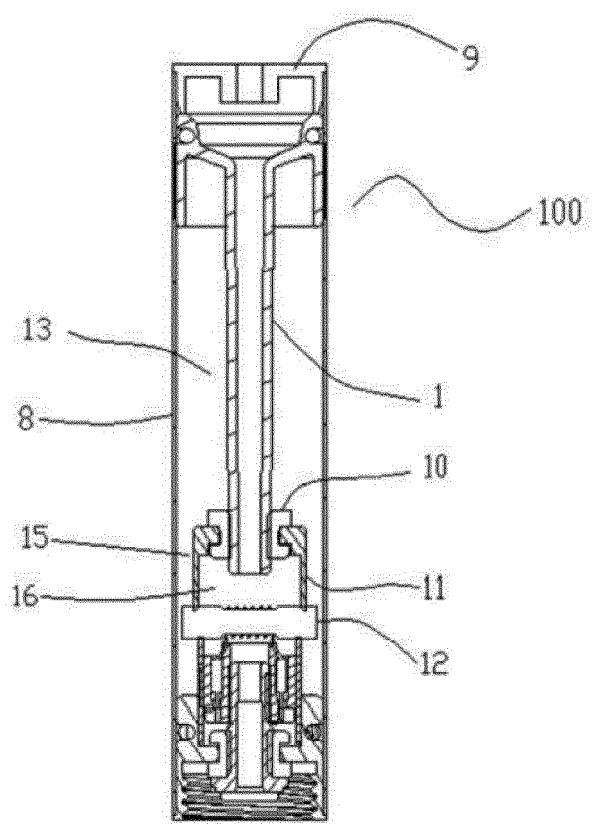
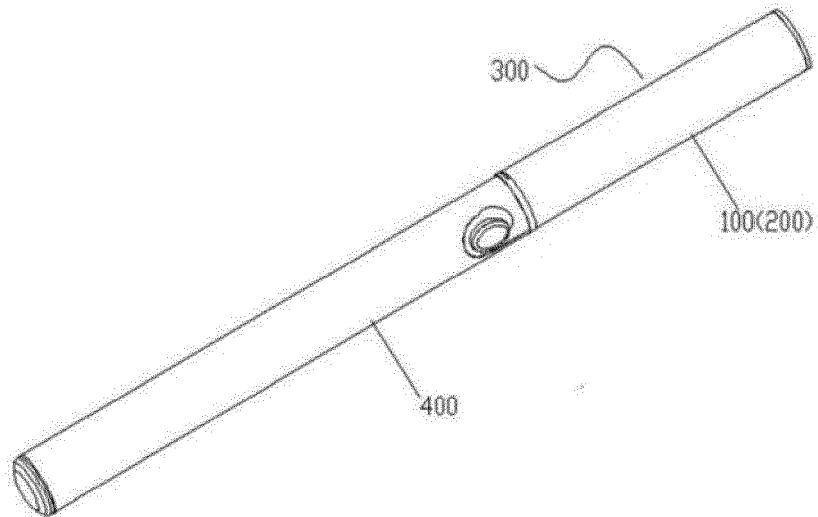
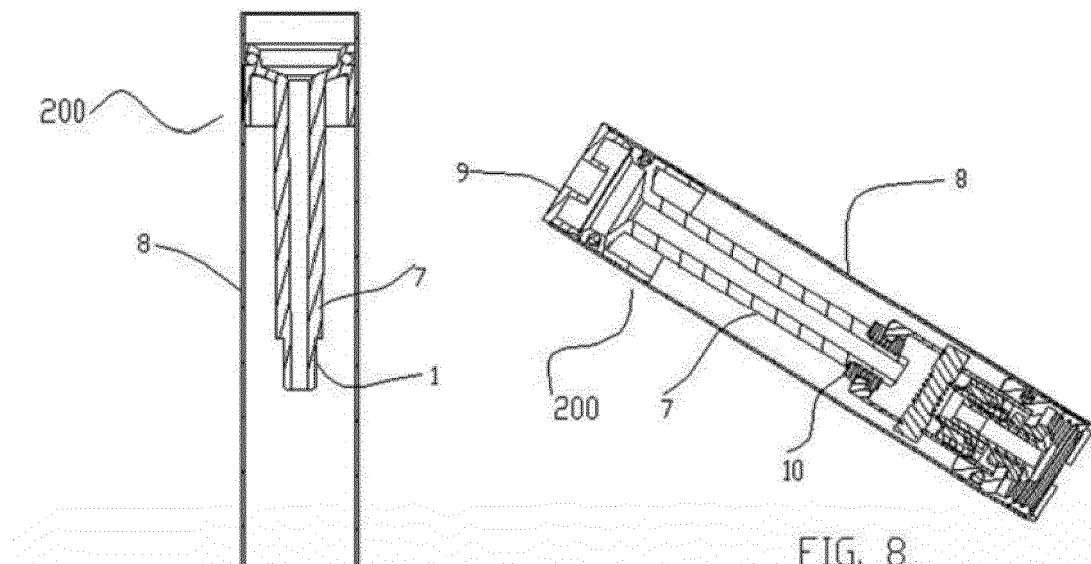


FIG. 6



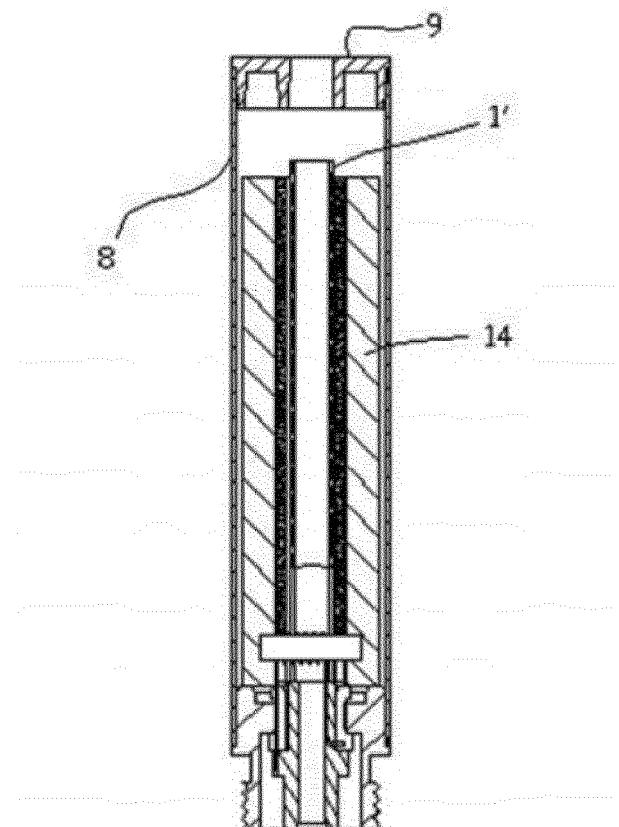


FIG. 10

(Prior art)



EUROPEAN SEARCH REPORT

Application Number
EP 13 19 7392

| DOCUMENTS CONSIDERED TO BE RELEVANT | | | CLASSIFICATION OF THE APPLICATION (IPC) |
|---|--|--|---|
| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | |
| X | US 2011/011396 A1 (FANG XIAOLIN [CN]) 20 January 2011 (2011-01-20) | 1-5,7,8, 10-12, 14-16 | INV. A24F47/00 |
| Y | * paragraphs [0012], [0013]; figures 1,2 * ----- CN 202 525 085 U (SHENZHEN HEYUAN TECHNOLOGY CO LTD) 14 November 2012 (2012-11-14) * the whole document * | 6,9,13 | |
| X | CN 202 005 248 U (LILONG WAN) 12 October 2011 (2011-10-12) * figures 4,7,8 * | 1,11 | |
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| A | US 2011/303231 A1 (LI YONGHAI [CN] ET AL) 15 December 2011 (2011-12-15) * abstract; figure 1 * | 1-16 | TECHNICAL FIELDS SEARCHED (IPC) |
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| The present search report has been drawn up for all claims | | | |
| 1 | Place of search Munich | Date of completion of the search 1 April 2014 | Examiner 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 | | | |

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 13 19 7392

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 The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

01-04-2014

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