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(54) **LOW-OXYGEN HEATING-TYPE SMOKING SET**

(57) A low-oxygen heating-type cigarette assembly, comprising a low-oxygen heating-type smoking set (B) and a low-oxygen heating-type cigarette (A). The low-oxygen heating-type smoking set (B) comprises a heating section (4) and a smoke extracting member (2) detachably arranged with the heating section (4), wherein the heating section (4) is provided with a cigarette receiving chamber (4-1), and the smoke extracting member (2) comprises a hollow smoke extracting cone (2-1) and a smoke transmission tube (2-2). The low-oxygen heating-type cigarette (A) comprises a tobacco section (1) and a filter mouthpiece section (3) detachably connected to each other; during inhalation, the tobacco section (1) and the filter mouthpiece section (3) of the low-oxygen heating-type cigarette (A) are detached, and are respectively assembled with the smoke extracting member (2) to form a segmented cigarette; the tobacco section (1) of the segmented cigarette is inserted into the cigarette receiving chamber (4-1) to start up a heating element for smoking. The split-type cigarette design significantly sim-

plifies the structure of the cigarette, keeps the tobacco section (1) in a low-oxygen environment, increases the heating temperature, prevents tobacco residue from falling out, and keeps the smoking set clean.

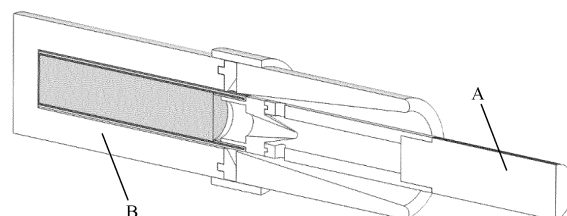


Figure 10

## Description

### FIELD OF THE INVENTION

[0001] The invention belongs to the field of heat-not-burn cigarettes, and particularly relates to an oxygen-depleted heating cigarette assembly.

### BACKGROUND OF THE INVENTION

[0002] Traditional tobacco has a history for hundreds of years and has been integrated into the lives of most smokers. In recent years, along with the improvement of the people's living standard, issues such as smoking and health, harm of second-hand smoke and the like are more and more emphasized by people, and the harm brought by the traditional tobacco products is becoming increasingly prominent. Meanwhile, with the implementation of WHO's "Framework Convention on Tobacco Control", especially the gradual expansion of smoking bans in public places around the world, the development environment of tobacco products has undergone significant and profound changes, and the structure of tobacco products is moving towards diversification and smoke-free development (Xiaobing Cheng, Baojiang Li, Yandong Han. The Development Status of New Tobacco in the World [J]. China Tobacco, 2014 (3): 38.). New tobacco products have gradually become a realistic choice for major multinational tobacco companies to cope with the declining sales of traditional tobacco products (Yali Liu, Jinbang Wang, Xinzhang Zhao, et al. Development Status and the Prospect of Heat-not-burn Tobacco Products [J]. Chinese Journal of Tobacco, 2018, 24 (4)).

[0003] At present, most of the heat-not-burn cigarettes adopt air as a carrier of smoke, in order to ensure that the tobacco is not burned, the applied heating temperature is usually lower and generally does not exceed 300 °C, compared with the traditional cigarette, the aroma components of the novel heat-not-burn cigarette are difficult to completely release, and the smoke quantity is insufficient, so that the cigarette is difficult to be accepted by traditional smokers. In addition, in order to ensure air circulation, the tobacco ends of the most of heat-not-burn cigarettes have an open structure, that is to say, tobacco shreds or reconstituted tobacco strips are directly exposed to the outside or connected with the external atmosphere through a certain airflow channel, and in the process of pulling out the cigarettes, tobacco residues will fall off, which is easy to cause pollution to the smoking sets, so that such type of tobacco needs time to spend time cleaning the smoking sets after a period of use.

[0004] If a closed cigarette structure is adopted, the oxygen content is decreased along with the heating process (due to the replacement effect of fresh smoke on the internal atmosphere). At this moment, even if the heating temperature is increased, the combustion phenomenon will not occur, and at meanwhile, the situation that the tobacco residues fall off so as to pollute the smoking set

will be occurred. However, because there is no carrier airflow flowing through the tobacco, closed cigarette smoke migration will become difficult.

[0005] The Coanda effect, also known as the Coanda effect or the wall effect, refers to the tendency of fluid flow or airflow to leave the original flow direction to flow with the protruding surface due to surface friction when the fluid flows through the surface of the object. The Venturi phenomenon refers to the low pressure generated near the high-speed flowing fluid, resulting in adsorption. Using the Coanda effect, the air entering the small hole can flow along the surface of the hollow smoke extraction cone. Due to the existence of the Venturi phenomenon, the gas flowing at a high speed along the surface of the extraction cone will form a negative pressure area at the opening of the extraction cone. Using the Coanda effect and the Venturi phenomenon, the concentration difference and the pressure difference can be formed inside and outside the closed tobacco section, and then the fresh smoke generated by the tobacco section can be extracted by utilizing the active diffusion of the gas.

[0006] In order to meet the smoking habit of the public for cigarettes, a smoke extraction structure is required to be used in each cigarette, which can greatly increase the production and manufacturing cost of the cigarette. If the smoke extraction structure is separated and reused, the production cost of the cigarette will be effectively saved.

### SUMMARY OF THE INVENTION

[0007] The present invention provides an oxygen-depleted heating cigarette assembly which comprises an oxygen-depleted heating smoking set, an oxygen-depleted heating cigarette and an oxygen-depleted heating smoking method.

[0008] An oxygen-depleted heating smoking set comprises a heating section with a cigarette accommodating cavity formed therein, wherein the oxygen-depleted heating smoking set further comprises a smoke extraction member which can be arranged separately therefrom, the smoke extraction member comprises a hollow smoke extraction cone and a smoke transmission pipe which is fixedly or detachably sleeved on the periphery of a cone body of the smoke extraction cone, a taper hole is provided on a cone apex and/or a side wall of the cone body, at least one through hole is provided on a circumferential side wall of the smoke transmission pipe, and the axial distance of said at least one through hole from a bottom surface of the cone body is smaller than that of the taper hole from the bottom surface of the cone body.

[0009] A sleeve section extending axially is provided at a bottom end of said cone body of the smoke extraction cone; one end of the smoke transmission pipe far away from said cone body is provided with an inner diameter expansion section which is axially extended.

[0010] Preferably, heating elements are arranged on the bottom surface and/or the circumferential side wall of the cigarette accommodating cavity.

**[0011]** Preferably, the oxygen-depleted heating smoking set further comprises a cap, the cap and the heating section are directly detachably connected with each other or detachably connected through a sealing ring, the cap is provided with a gradually expanding inner cavity which is in a truncated cone shape, the apical angle of the cone is not more than 10 degrees, and one end of the cap having a smaller inner diameter is directly or indirectly detachably connected with the heating section.

**[0012]** Preferably, the shape of said smoke extraction member is suitable for the inside of the cigarette accommodating cavity in which the smoke extraction member is accommodated.

**[0013]** An oxygen-depleted heated cigarette comprises a tobacco section and a filter section which are detachably connected with each other, wherein one end surface and/or circumferential side face of the tobacco section is sealed by air-tight foil paper.

**[0014]** One end of the tobacco section that is not sealed has an axially extending unfilled section, the filter section has an exposed section that is not wrapped by the tipping paper, the unfilled section and the exposed section are shaped to fit one another such that the exposed section is inserted into the unfilled section when the tobacco section and filter section are connected together. An oxygen-depleted heating cigarette assembly, an oxygen-depleted heating smoking set and an oxygen-depleted heating cigarette.

**[0015]** The shape of the unfilled section of the tobacco section is also suitable for being inserted into the sleeve section of said smoke extraction cone, and the shape of said exposed section of said filter tip section is also suitable for being inserted into said inner diameter expansion section of said smoke transmission pipe.

**[0016]** A method for smoking an oxygen-depleted heating cigarette by using the oxygen-depleted heating cigarette assembly, when smoking, disassembling the tobacco section and the filter tip section of the oxygen-depleted heating cigarette, and assembling said tobacco section and filter tip section respectively into the sleeve sections and the inner diameter expansion section at both ends of the smoke extraction member, so as to form a sectional-type cigarette; then removing the cap of the oxygen-depleted heating smoking set, inserting said tobacco section of the sectional-type cigarette into the cigarette accommodating cavity of the heating section, covering the cap back, starting heating elements arranged at the bottom surface and/or circumferential side wall of the cigarette accommodating cavity for suction.

**[0017]** The present invention has following advantages: 1. the air is not used as a carrier, and by using the Venturi effect and the Coanda effect to extract smoke, the oxygen content can be reduced, thus the heating temperature can be greatly increased, which causes both reconstituted tobacco and common cigarette formulas to be utilized by such type of the cigarette, so as to reduce the cost; 2. By using a sealed structure, there is no tobacco residue falling off, and the smoking set is not re-

quired to be cleaned frequently; 3. the release of aroma components in the tobacco is more sufficient, easy to release continuously, and the taste is closer to that of the traditional tobacco, which is easier to be accepted by traditional smokers; 4. Through a sectional-type cigarette structural design, the smoke extraction section is reusable, and the production and manufacturing cost is greatly reduced.

## BRIEF DESCRIPTION OF THE DRAWINGS

### [0018]

Figure 1 is a schematic structural view of an oxygen-depleted cigarette of the present invention when it is combined with a smoke extraction stage,

Figure 2 is an axial cross-sectional view of the explosive structure to be assembled in Figure 1, In Figures 1 and 2: 1. a tobacco section, 2. a smoke extraction section, 3. a filter tip section.

Figure 3 is an axial sectional view of the tobacco section,

In Figure 3: 1-1. the tobacco part, 1-2. the aluminum foil paper, 1-3. the cigarette paper, 1-4. unfilled sections.

Figure 4 is a schematic diagram of the explosive structure to be assembled of the smoke extraction section,

Figure 5 is axial sectional view of the explosive structure to be assembled of the smoke extraction section,

In Figures 4 and 5: 2-1 an extraction cone, 2-2 a smoke transmission pipe, 2-1-1 a base, 2-1-2 cone body, 2-1-3 a boss, 2-1-4 a taper hole, 2-1-5 a sleeve section; 2-2-1 a slot, 2-2-2 a through hole, 2-2-3 a groove.

Figure 6 is a schematic structural view of the filter tip section,

In Figure 6: 3-1, an exposed section, 3-2 tipping paper.

Figure 7 is an axial cross-sectional view of an explosive structure to be assembled in the oxygen-depleted heating smoking set.

In Figure 7: 4. a heating section, 4-1 a cigarette accommodating cavity; 5. a sealing ring, 6 a cap, 6-1 a gradually expanded inner cavity.

Figure 8 is a schematic diagram of an oxygen-depleted heating cigarette (i.e., the structure of a cigarette at the factory).

Figure 9 is a schematic view of the shape and structure of inserting the cigarette into the heating smoking set when smoking.

Fig. 10 is a cross-sectional view of the structure of Figure 9.

FIG. 11 is a schematic view of the smoking set when it is stored.

In Figures 9, 10, and 11: A. an oxygen-depleted heating cigarette, B. a heating smoking set, 2. a smoke

extraction section.

Fig. 12 is an axial sectional view of the hollow smoke extraction cone (a taper hole is opened on the side wall of the extraction cone).

In Figure 12: 2-1-2, a cone body, 2-1-4, a taper hole

## DETAILED DESCRIPTION OF THE EMBODIMENTS

**[0019]** The present invention will further describe the oxygen-depleted heating smoking set, the oxygen-depleted heating cigarette, and the oxygen-depleted heating cigarette assembly and their using methods one by one in conjunction with the accompanying drawings:

### Example 1

**[0020]** An oxygen-depleted heating smoking set, as shown in Figures 7, 4, 5, 11 and 12, comprises a heating section (4), a cigarette accommodating cavity (4-1) is arranged within the heating section (4), wherein the oxygen-depleted heating smoking set also comprises a smoke extraction member (2) which can be arranged separately from the smoking set, the smoke extraction member (2) comprises a hollow smoke extraction cone (2-1) and a smoke transmission pipe (2-2) which is fixedly or detachably sleeved on the periphery of the cone body (2-1-2) of the smoke extraction cone (2-1), a taper hole (2-1-4) is provided on the cone apex and/or the side wall of the hollow smoke extraction cone (2-1), at least one through hole (2-2-2) is provided on the circumferential side wall of the smoke transmission pipe (2-2), the axial distance between the through hole (2-2-2) and the bottom surface of the cone body is smaller than the axial distance between the taper hole (2-1-4) and the bottom surface of the cone body.

**[0021]** The bottom end of the smoke extraction cone (2-1) is provided with an axially extending sleeve section (2-1-5); the end of the smoke transmission pipe (2-2) away from the cone body is provided with an axially extended inner diameter expansion section (2-2-3) (see Figure 5). Preferably, the length of the sleeve section (2-1-5) is 3-5 mm, and the length of the inner diameter expansion section (2-2-3) is equal to the length of the sleeve section (2-1-5).

**[0022]** The smoke extraction cone (2-1) and the smoke transmission pipe (2-2) are hermetically connected through a boss (2-1-3) and a slot (2-2-1) machined on the end surfaces of the bases of the extraction cone and the smoke transmission pipe (see Figure 5).

**[0023]** The number of the through holes (2-2-2) on the pipe wall of the smoke transmission pipe (2-2) is 2-10, the through holes are uniformly distributed along the circumference thereof, the diameter of each through hole is 0.5-2mm, the diameter is inversely proportional to the number of the through holes, preferably, the number of the through holes is 2, and the diameter of the through hole is 0.8mm.

**[0024]** In the smoke extraction section, the ratio be-

tween the length of the extraction cone and the length of the transmission pipe is in the range of 1:3 to 1:6, preferably 1:4.

**[0025]** Heating elements are arranged on the bottom surface and/or the circumferential side wall of the cigarette accommodating cavity (4-1).

**[0026]** The oxygen-depleted heating smoking set also comprises a cap (6), the cap and the heating section (4) are directly detachably connected with each other or detachably connected through a sealing ring (5), the cap (6) is provided with a gradually expanded inner cavity (6-1) which is shaped in a truncated cone and the conical apical angle thereof is not greater than 10 degrees, and an end of the cap (6) with a smaller inner diameter is directly or indirectly detachably connected with the heating section (4). The configuration of conical apical angle being not greater than 10 degrees is to ensure that air can smoothly enter the smoke transmission pipe through the through hole (2-2-2) on the pipe wall of the smoke transmission pipe, so as to realize the extraction effect of the smoke. The heating cavity, the sealing ring and the cap are coaxial, and the cap is connected with the heating cavity in a threaded, buckling or magnetic attraction manner; the sealing ring (5) is embedded in the heating cavity through a groove machined on the end surface of the heating cavity.

**[0027]** The shape of the smoke extraction member (2) is suitable for being received inside the cigarette accommodating cavity (4-1) of the heating section (4) (see Figure 11).

### Example 2

**[0028]** An oxygen-depleted heating cigarette, as shown in Figure 8, comprises a tobacco section (1) and a filter tip section (3) which are detachably connected with each other, wherein one end surface and/or circumferential side surface of the tobacco section (1) is sealed by air-tight foil paper.

**[0029]** The end of the tobacco section (1) that is not sealed has an axially extending unfilled section (1-4) (see Figures 2, 3), and the filter tip section (3) has an exposed section (3-1) (see Figure 6) that is not wrapped with the tipping paper (3-2); the shape of the unfilled section and the shape of exposed section are fit to each other, such that when the tobacco section (1) and the filter section (3) are connected together, the exposed section (3-1) is inserted into the unfilled section (1-4) (see Figures 3, 6, 8).

**[0030]** Preferably, the tobacco section is a conventional tobacco or reconstituted tobacco sheet base.

**[0031]** Preferably, the length of the unfilled section (1-4) of the tobacco section is 3-5mm, and the length of the exposed section (3-1) of the filter tip section is equal to the length of the unfilled section (1-4).

## Example 3

[0032] An oxygen-depleted heating cigarette assembly, as shown in Figures 9 and 10, comprises an oxygen-depleted heated smoking set (B) and an oxygen-depleted heating cigarette (A).

[0033] It is apparent from Figure 10 in combination with Figures 3, 5 and 6, the shape of the unfilled section (1-4) of the tobacco section (1) is also suitable for inserting into the sleeve section (2-1-5) of the smoke extraction cone (2-1), and the shape of exposed section (3-1) of the filter tip section (3) is also suitable for inserting into the inner diameter expansion section (2-2-3) of the smoke transmission pipe (2-2).

## Example 4

[0034] The smoking method using the above-mentioned oxygen-depleted heating cigarette assembly comprises following steps: when smoking, disassembling the tobacco section (1) and the filter tip section (3) of the oxygen-depleted heating cigarette, and respectively assembling them into the sleeve section (2-1-5) and the inner diameter expansion section (2-2-3) at both ends of the smoke extraction section (2) to form a sectional-type cigarette (see the Figures 1 and 2); then removing the cap (6) of oxygen-depleted heating smoking set, inserting the tobacco section (1) of the sectional-type cigarette into the cigarette accommodating cavity (4-1) of the heating section (4), covering the cap (6) back, starting the heating element arranged on bottom surface and/or circumferential side wall of cigarette accommodating cavity (4-1) for suction. See Figures 9 and 10 for a specific usage status.

[0035] It should be further noted that the cigarette and the heating smoking set of the present invention are separately placed when leaving the factory, wherein the tobacco section (1) and the filter tip section (3) are respectively packaged and then connected and placed together (see fig. 8), and the heating smoking set and the smoke extraction section (2) are combined together and can be repeatedly used (see Figure 11); when smoking, first, the tobacco section (1) is separated from the filter tip section (3), the tobacco section (1), the smoke extraction section (2) and the filter tip section (3) are sequentially plugged to form a sectional-type cigarette to be smoked, and then the sectional-type cigarette to be smoked is inserted into a heating smoking set (see Figures 9 and 10); after smoking, the tobacco section (1) and the filter tip section (3) are discarded, and the heating smoking set and the smoke extraction section (2) can be reused. The structure of the oxygen-depleted heating smoking set is shown in Figure 11 when being stored.

[0036] During smoking (suction), the air firstly enters a space between the cap 6 and the sectional-type cigarette, then enters the inside of the smoke transmission pipe through the through hole (2-2-2) on the pipe wall of the smoke transmission pipe and is sprayed onto the

surface of the extraction cone. Due to the Venturi effect and the Coanda effect, a negative pressure is formed at the position of the taper hole (2-1-4); heating the tobacco section may establish a positive pressure at the tobacco section; the existence of the pressure difference between the positive and negative pressure may cause the flow of the smoke, so that the smoke flows out of the taper hole (2-1-4) and enters the oral cavity through the smoke transmission pipe cavity and the filter tip. The smoke transmission pipe has the dual functions of smoke extraction and smoke cooling. The smoking resistance of the cigarette can be adjusted by changing the diameter and the position of the through hole (2-2-2) on the smoke transmission pipe.

## Claims

1. An oxygen-depleted heating smoking set comprises a heating section (4) with a cigarette accommodating cavity (4-1) formed therein, **characterized in that,**

said oxygen-depleted heating smoking set further comprises a smoke extraction member (2) which can be arranged separately from the oxygen-depleted heating smoking set, said smoke extraction member (2) comprises a hollow smoke extraction cone (2-1) and a smoke transmission pipe (2-2) which is fixedly or detachably sleeved on the periphery of a cone body (2-1-2) of the smoke extraction cone (2-1), a taper hole (2-1-4) is provided on a cone apex and/or a side wall of the cone body (2-1-2), at least one through hole (2-2-2) is provided on a circumferential side wall of the smoke transmission pipe (2-2), and the axial distance of said at least one through hole from a bottom surface of the cone body (2-1-2) is smaller than that of the taper hole (2-1-4) from the bottom surface of the cone body (2-1-2).

2. The oxygen-depleted heating smoking set according to claim 1, **characterized in that** a sleeve section (2-1-5) extending axially is provided at a bottom end of said cone body of the smoke extraction cone (2-1); one end of the smoke transmission pipe (2-2) far away from said cone body is provided with an inner diameter expansion section (2-2-3) which is axially extended.
3. The oxygen-depleted heating smoking set according to claim 1, **characterized in that** heating elements are provided at the bottom and/or at the circumferential side wall of said cigarette accommodating cavity (4-1).
4. The oxygen depleted heating smoking set according

to claim 1, **characterized in that**, further comprises a cap (6), which is directly and detachably connected to the heating section (4) or is detachably connected with the heating section via a sealing ring (5), said cap (6) has a gradually expanding inner chamber (6-1) shaped in a truncated cone, and the apical angle of the cone is not more than 10 degrees, one end of said cap (6) having a smaller inner diameter is detachably connected to the heating section (4) either directly or indirectly.

5. The oxygen-depleted heating smoking set according to claim 1, **characterized in that** the shape of said smoke extraction member (2) is suitable for the inside of the cigarette accommodating cavity (4-1) in which the smoke extraction member is accommodated.

6. An oxygen-depleted heating cigarette, **characterized in that**,

said oxygen-depleted heating cigarette comprises a tobacco section (1) and a filter tip section (3) which are detachably connected with each other,  
wherein one end surface and/or a circumferential side surface of the tobacco section (1) is sealed by an air-tight foil paper.

7. The oxygen-depleted heating cigarette according to claim 6, **characterized in that** one end of the tobacco section (1) which is not sealed has an unfilled section (1-4) axially extended, said filter tip section (3) has an exposed section (3-1) which is not wrapped by a tipping paper (3-2), the shape of said unfilled section and that of said exposed section are fit to each other, such that said exposed section (3-1) is inserted into the unfilled section (1-4) when the tobacco section (1) and the filter tip section (3) are connected together.

8. An oxygen-depleted heating cigarette assembly comprising the oxygen-depleted heating smoking set (B) according to any one of claims 1 to 5 and the oxygen-depleted heating cigarette (A) according to claims 6 or 7.

9. The oxygen-depleted heating cigarette assembly according to claim 8 **characterized in that** the shape of said unfilled section (1-1) of said tobacco section (1) is also suitable for being inserted into the sleeve section (2-1-5) of said smoke extraction cone (2-1), and the shape of said exposed section (3-1) of said filter tip section (3) is also suitable for being inserted into said inner diameter expansion section (2-2-3) of said smoke transmission pipe (2-2).

10. A method for smoking an oxygen-depleted heating

cigarette, **characterized in that**, using the oxygen-depleted heating cigarette assembly according to claim 8,

when smoking, disassembling the tobacco section (1) and the filter tip section (3) of the oxygen-depleted heating cigarette, and assembling said tobacco section and filter tip section respectively into the sleeve sections (2-1-5) and the inner diameter expansion section (2-2-3) at both ends of the smoke extraction member (2), so as to form a sectional-type cigarette;  
then removing the cap (6) of the oxygen-depleted heating smoking set, inserting said tobacco section (1) of the sectional-type cigarette into the cigarette accommodating cavity (4-1) of the heating section (4),  
covering the cap (6) back, starting heating elements arranged at the bottom surface and/or circumferential side wall of the cigarette accommodating cavity (4-1) for suction.

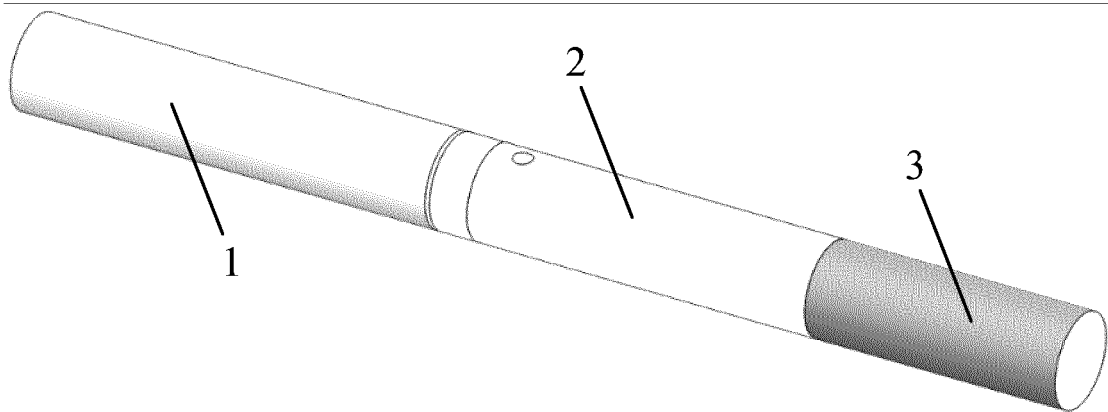


Figure 1

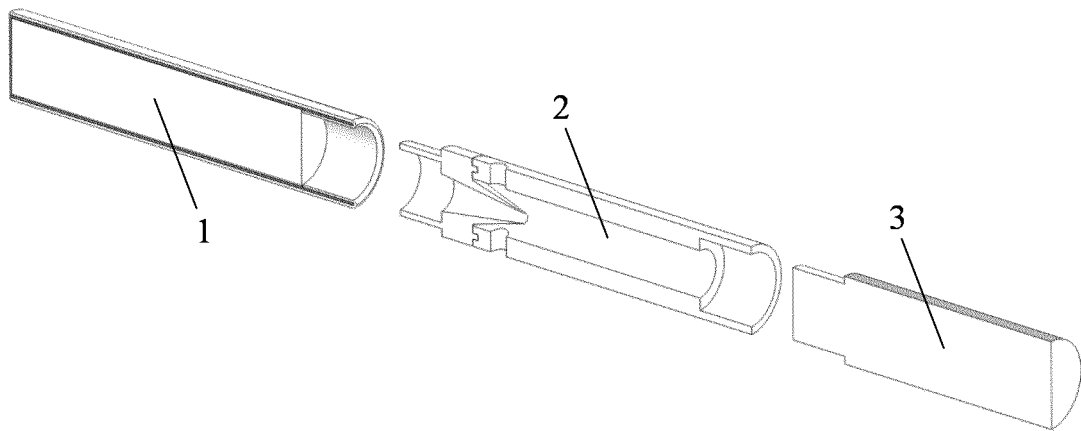


Figure 2

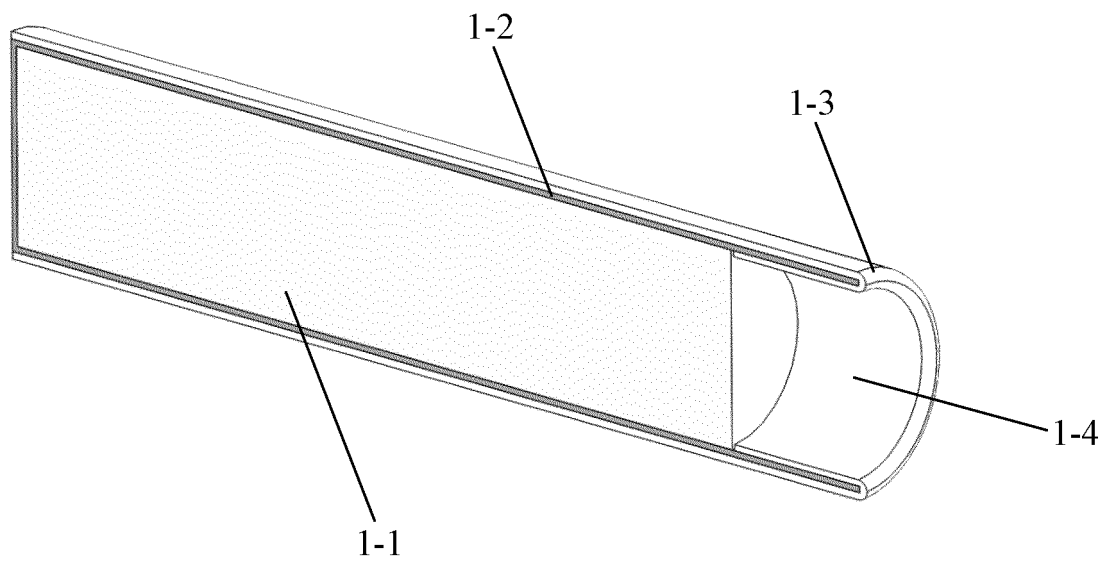


Figure 3

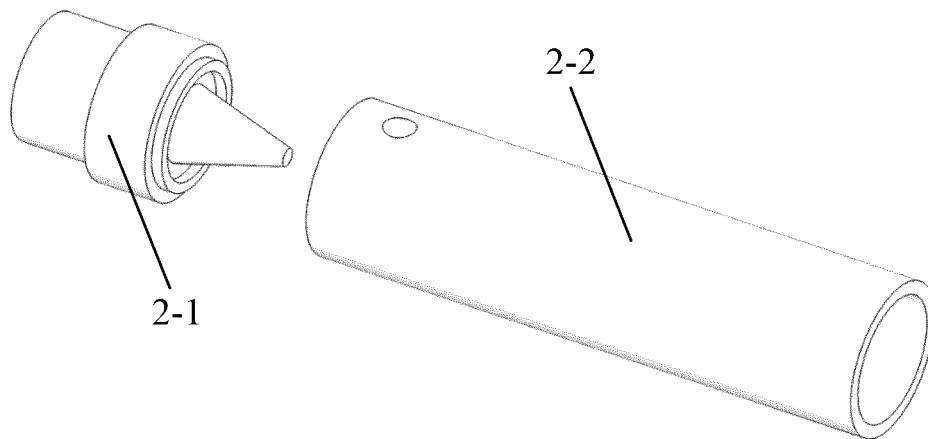


Figure 4



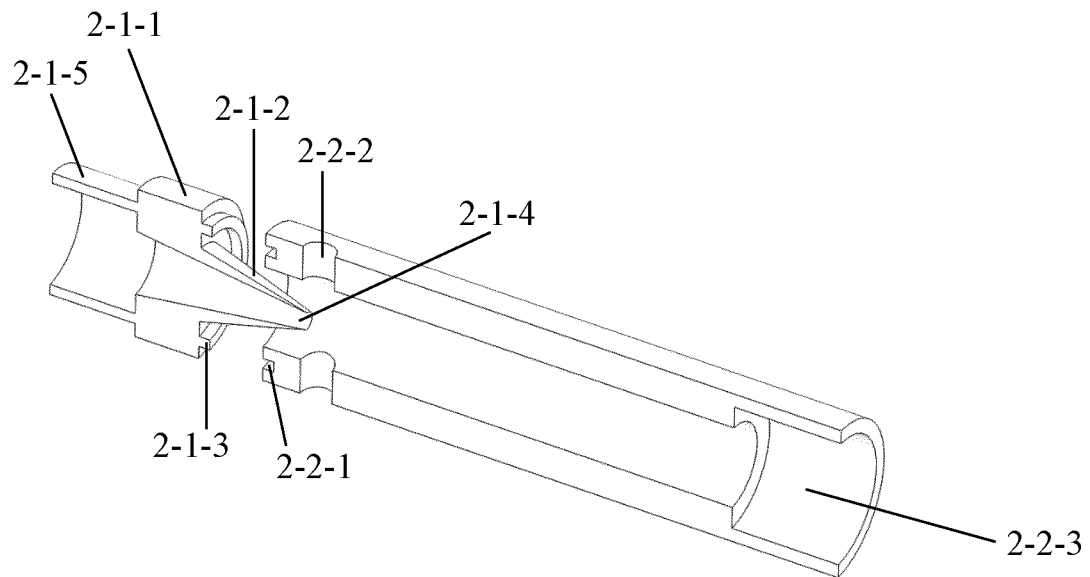


Figure 5

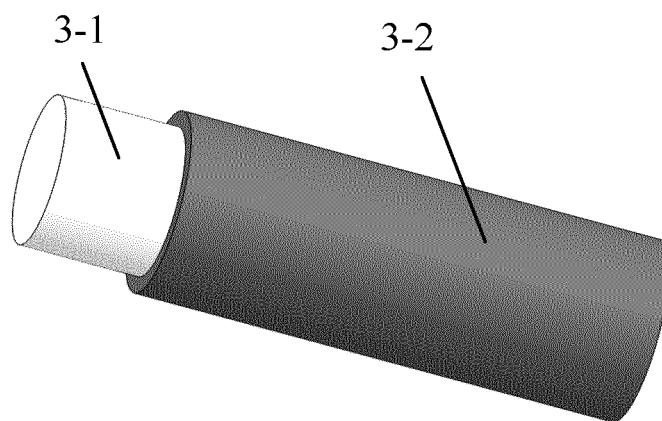


Figure 6

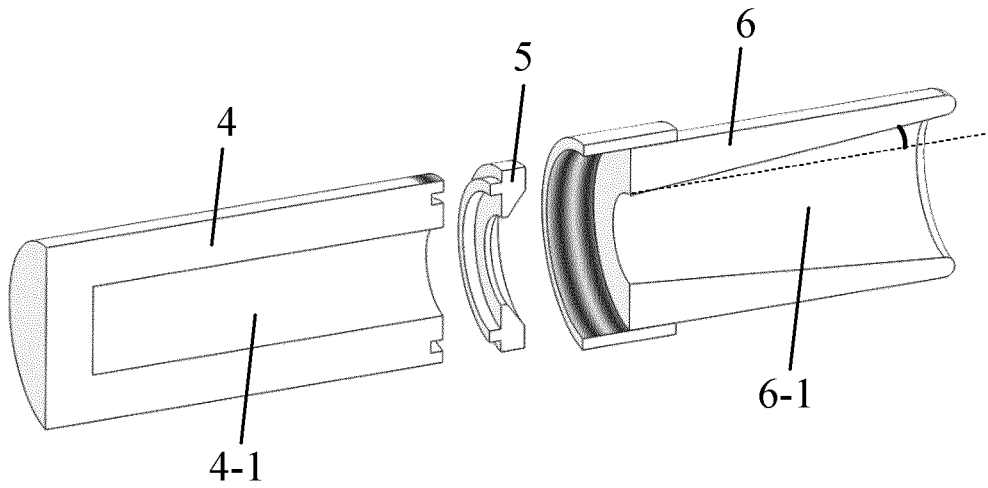


Figure 7

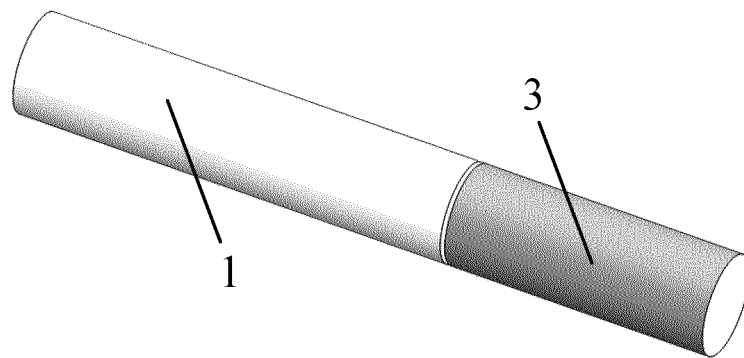


Figure 8

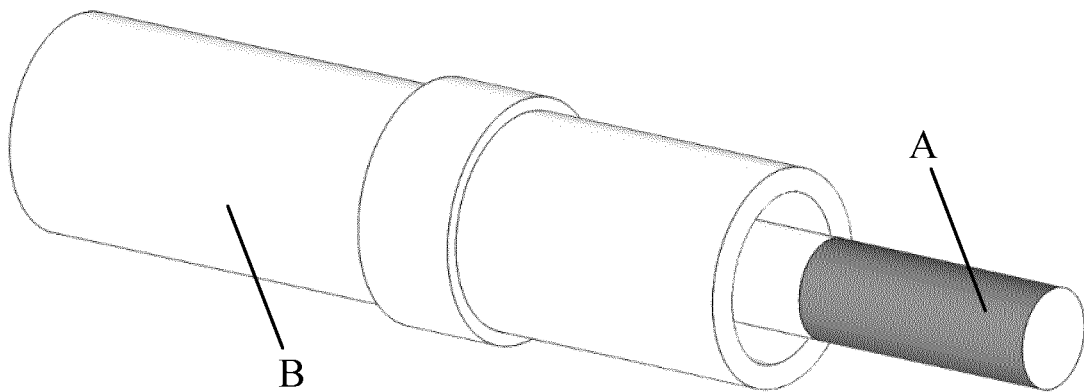


Figure 9

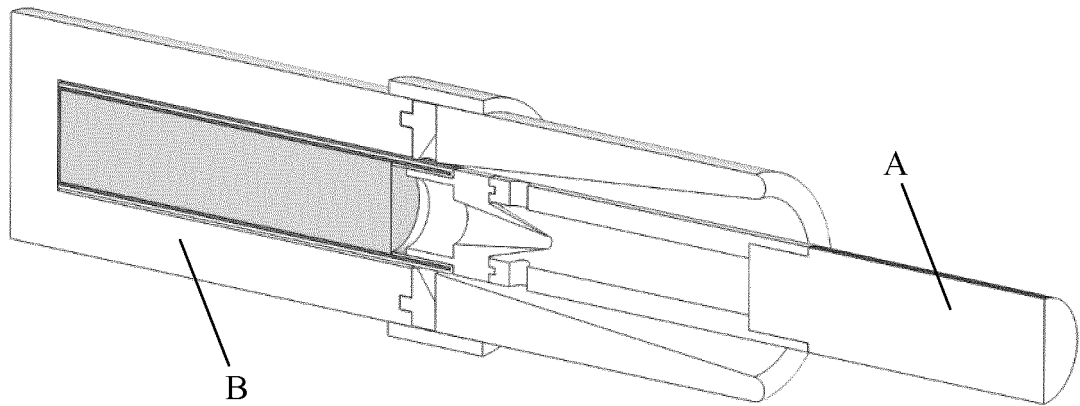


Figure 10

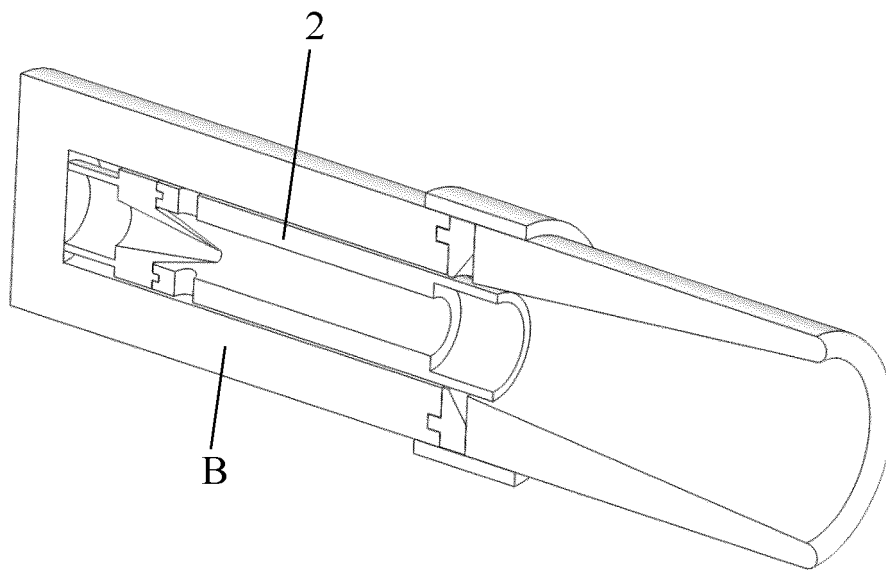


Figure 11

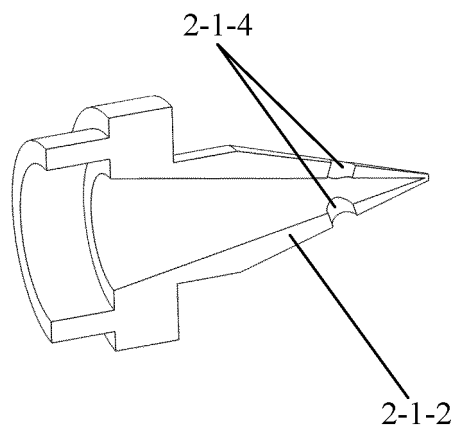


Figure 12

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2020/139288

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> A24D 1/20(2020.01)i; A24D 3/17(2020.01)i; A24F 40/40(2020.01)i; A24F 40/20(2020.01)i According to International Patent Classification (IPC) or to both national classification and IPC																					
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) A24D; A24F 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) WPI, EPODOC, CNPAT, CNKI: 烟, 贫氧, 非燃烧, 不燃烧, 加热, 可拆, 拆卸, 锥, 孔, 洞, 康达, 柯恩达, 文丘里, 负压, cigarette, tobacco, oxygen, non-burning, heating, disassemble, dismantle, detachable, removable, coanda, venturi, negative pressure																					
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>																					
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<table border="0"> <tr> <td style="vertical-align: top;"> <p>* Special categories of cited documents:</p> <p>“A” document defining the general state of the art which is not considered to be of particular relevance</p> <p>“E” earlier application or patent but published on or after the international filing date</p> <p>“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)</p> <p>“O” document referring to an oral disclosure, use, exhibition or other means</p> <p>“P” document published prior to the international filing date but later than the priority date claimed</p> </td> <td style="vertical-align: top;"> <p>“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</p> <p>“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</p> <p>“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</p> <p>“&amp;” document member of the same patent family</p> </td> </tr> </table>	<p>* Special categories of cited documents:</p> <p>“A” document defining the general state of the art which is not considered to be of particular relevance</p> <p>“E” earlier application or patent but published on or after the international filing date</p> <p>“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)</p> <p>“O” document referring to an oral disclosure, use, exhibition or other means</p> <p>“P” document published prior to the international filing date but later than the priority date claimed</p>	<p>“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</p> <p>“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</p> <p>“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</p> <p>“&amp;” document member of the same patent family</p>																			
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Date of the actual completion of the international search <b>06 August 2021</b>	Date of mailing of the international search report <b>27 September 2021</b>																				
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INTERNATIONAL SEARCH REPORT

International application No. <b>PCT/CN2020/139288</b>
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C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	CN 213307431 U (CHINA TOBACCO YUNNAN INDUSTRIAL CO., LTD. et al.) 01 June 2021 (2021-06-01) description, paragraph [0022]	6, 7
A	WO 2019245253 A1 (KT & G CORP.) 26 December 2019 (2019-12-26) entire document	1-10

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

International application No.

**PCT/CN2020/139288**

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 111588089 A	28 August 2020	None	
CN 109691695 A	30 April 2019	None	
CN 106858726 A	20 June 2017	US 2020008475 A1	09 January 2020
		CN 106858726 B	19 June 2018
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CN 112704261 A	27 April 2021	None	
CN 212414723 U	29 January 2021	None	
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**REFERENCES CITED IN THE DESCRIPTION**

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- **YALI LIU ; JINBANG WANG ; XINZHANG ZHAO et al.** Development Status and the Prospect of Heat-not-burn Tobacco Products [ J ]. *Chinese Journal of Tobacco*, 2018, vol. 24, 4 **[0002]**