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(54) HEAT-NOT-BURN AEROSOL GENERATING PRODUCT

(57) A heat-not-burn aerosol generating product, comprising an outer tube (1) comprising the following components from upstream to downstream: an aerosol generating material section (3); and air guide member (5) having a cross-sectional area smaller than a cross-sectional area of the outer tube (1) and having a central air channel (51) axially arranged. An air inlet (11) is provided on a side wall of the outer tube (1) surrounding the air guide member (5), a gap between an outer wall of the air guide member (5) and an inner wall of the outer tube (1) forms a side air channel (52) which communicates with the central air channel (51) at an upstream end surface of the air guide member (5). By means of ingenious air channel design, temperature fluctuation caused by air flowing through the aerosol generating material section (3) is avoided, and aerosol from the aerosol generating material section (3) can be extracted.

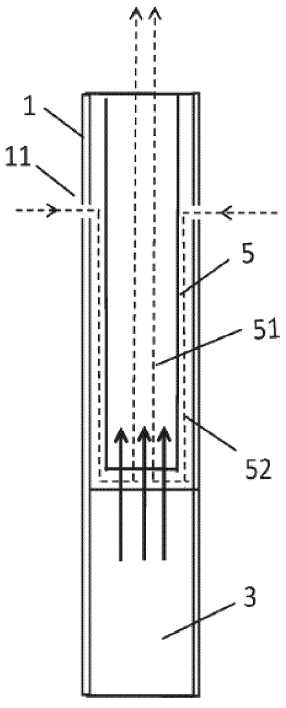

FIG. 1

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Description

FIELD

[0001] The present disclosure relates to the field of aerosol generating products.

BACKGROUND

[0002] In recent years, using an electronic device to heat an aerosol generating material in a non-combustion manner has gradually become a mainstream aerosol generating method to replace conventional ignition cigarettes. The aerosol generating material may generally be a solid material of plant leaves with corresponding substance components, and may further be added with aroma materials, so that aerosols with a unique fragrance can be generated under a heating condition for a user to inhale.

[0003] However, the current heat-not-burn aerosol generating product has the following problems:

1. At present, the air flow path in the heat-not-burn product is almost unidirectional, and during a suction process, air enters from an end of the cigarette, passes through the heated tobacco material, brings out the aerosols generated by the pyrolysis of the heated material, and then enters the mouth of the sucker. During the air flow process triggered by the suction action, cold air will be mixed into a material heating zone, which will cause a sharp decrease in the temperature of the heated material, resulting in a significant temperature fluctuation in a subsequent material heating zone. The types and degrees of cracking reactions of the material at different temperatures are different, the released aroma substances are also different, bringing the problem of inconsistent quality between a suction front section, a middle section, and a rear section, and between a previous suction and a next suction to the suction user.

2. Since different suckers have different suction habits, the degree of temperature reduction in the material heating zone caused by the airflow brought by the suction is different, which brings great uncertainty to the consistency of the temperature curve of a heater, which is already a common problem in the heat-not-burn product.

3. At present, the airflow formed in the suction process of the heat-not-burn cigarette with a hole structure can only change the suction resistance and reduce the temperature of the aerosol, and the low-temperature air cannot effectively carry out the aerosol without passing through the material heating zone and maintaining the temperature of the heating zone.

[0004] In order to solve the above problems, the present disclosure is provided.

SUMMARY

[0005] The present disclosure provides a heat-not-burn aerosol generating product, including an outer tube 1, wherein the following components are included in the outer tube 1 from upstream to downstream:

an aerosol generating material section 3; and

an air guide member 5 having a central air channel 51 arranged axially, wherein an air inlet 11 is provided on a side wall of the outer tube 1 surrounding the air guide member 5, a gap between an outer wall of the air guide member 5 and an inner wall of the outer tube 1 forms a side air channel 52, and the side air channel 52 is in communication with the central air channel 51 at an upstream end surface of the air guide member 5.

[0006] Preferably, the heat-not-burn aerosol generating product of the present disclosure is further provided with an isolation member 4 between the aerosol generating material section 3 and the air guide member 5, and the isolation member 4 has a central air guide hole 41 and/or a side air guide groove 42.

[0007] Wherein, if the term "preferred" is used to modify the technical feature, it means that the technical feature is not a necessary technical feature, but rather optional and preferably present.

[0008] Wherein, the upstream and the downstream are defined by the flow direction of the aerosol. Typically, the aerosol generating material section is located upstream, while a filter section is located downstream.

[0009] Wherein, the isolation member, when present, serves to prevent the aerosol generating material section from moving downstream and provide a delivery channel for the aerosol. When a heating element is inserted into the aerosol generating material section, the aerosol generating material tends to move downstream due to the pushing force of the insertion, which will result in insufficient thermal contact between the heating element and the aerosol generating material section. This tendency to move downstream can be prevented by an adhesion force and/or a frictional resistance between the periphery of the isolation member and the inner wall of the outer tube. When the aerosol generating material is in a shape of particles, the isolation member can also serve to constrain the particles to prevent them from scattering downstream. Of course, when the aerosol generating material section is an integral material, such as an integral round rod, and is reserved with a space for the heating element to be inserted, or when the heating is carried out on the periphery of the aerosol generating material section 3, the isolation member may also be omitted since there is no downstream pushing force.

[0010] Preferably, the far lip end of the outer tube 1 is provided with a sealing film 2, and/or, the wall of the outer tube 1 surrounding the aerosol generating material section 3 is airtight. The purpose of this arrangement is to block external air from entering the aerosol generating material section and maintain an atmosphere of oxygen-depleted or even oxygen-isolation within the aerosol generating material section. Therefore, preferably, the sealing film 2 is an airtight sealing film. Of course, if an aerosol generating device used in conjunction with the aerosol generating product can provide a sealing measure, the end of the heat-not-burn aerosol generating product of the present disclosure may not provided with the sealing film 2, and the wall of the outer tube may also be non airtight.

[0011] Preferably, the periphery of the air guide member 5 is provided with at least one, preferably a plurality of vent grooves extending axially, and the side air channel 52 is formed between the vent groove and the inner wall of the outer tube 1. More preferably, the plurality of vent grooves extending axially are uniformly distributed along the outer periphery of the air guide member. The cross-sectional shapes of the central air channel and side air channel are both unlimited.

[0012] Wherein, the aerosol generating material section 3 contains an aerosol generating material which is filamentous, sheet-like, granular, or monolithic. Preferably, the aerosol generating material may be, for example, tobacco, or of course, other herbaceous plants.

[0013] Preferably, a filter section 6 is further provided downstream of the air guide member 5.

[0014] The respective materials of the isolation member 4 and the air guide member 5 are not limited, as long as they can withstand a high temperature, for example, do not soften and deform and do not release harmful substances at 250 °C or above. Preferably, the isolation member 4 and the air guide member 5 may be each independently made of a silicone material or a ceramic material.

[0015] Preferably, the air inlet 11 is an annular notch, an arc-shaped notch, or a scattered notch that penetrates through the wall of the outer tube 1.

[0016] Preferably, the outer tube 1 is formed by winding a paper or is a preformed paper tube.

[0017] The heating direction of the heat-not-burn aerosol generating product of the present disclosure in the aerosol generating device may be a central heating (that is, the heating element is inserted into the aerosol generating material for heating) or a circumferential heating (that is, the heater surrounds the outer tube for heating from inside to outside), and the heating manner may be a resistance heating manner or an electromagnetic heating manner. Therefore, the heat-not-burn aerosol generating product of the present disclosure has a wide range of applications and can be well matched with various smoking devices.

[0018] When using the aerosol generating device to heat the heat-not-burn aerosol generating product of the present disclosure, the aerosol generating material section is heated to generate aerosols. When the user sucks at the near lip end of the outer tube, external ambient air enters the side air channel 52 from the air inlet 11 and moves along the side air channel 52 towards the upstream end of the aerosol generating product, and encounters the aerosol at the upstream end surface of the air guide member 5, and carries the aerosol to turn into the central air channel, thereby completing the extraction and carrying of the aerosol, and then jointly flows downstream along the central air channel to the mouth of the user.

[0019] Compared to prior art, the present disclosure has the following beneficial effects:

1. The ambient air does not flow through the aerosol generating material section after entering the cigarette, but rather extracts at the downstream of the aerosol generating material section the aerosol, and carries the aerosol generated by the aerosol generating material by means of airflow diversion to the downstream of the cigarette. Since the ambient air does not flow through the aerosol generating material section, the problems of large temperature fluctuation and inconsistent aroma release caused by air entering the section can be avoided. Therefore, by using the aerosol generating product of the present disclosure, the temperature in the material heating zone can be effectively kept constant, the smoke is large in amount and good in consistency, the smoking sensory quality is improved, the consistency before and after suction is good, thereby providing a better suction experience for the smoker, and meanwhile, the uncontrollable factor of the temperature setting of the heater is greatly reduced.

2. Since there is no or little external air entering the aerosol generating material section, the section is under an oxygen-lean or even oxygen-isolation condition. Under this condition, the ignition point of the material is increased, which can effectively avoid charring or combustion of the aerosol generating material due to an excessively high temperature, thereby avoiding a burnt taste or a combustion taste. In addition, a higher heating temperature can be used (such as 350 °C higher than a conventional heating temperature, or even more than 400 °C) to fully release the aerosol, especially those aroma molecules that are only released at higher temperatures, to provide a richer flavor experience.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020]

FIG. 1 is a schematic structural diagram of a heat-not-burn aerosol generating product of the present disclosure, without an isolation member, a sealing

film, and a filter section.

FIG. 2 is a schematic structural diagram of a heat-not-burn aerosol generating product of the present disclosure, with an isolation member, a sealing film, and a filter section.

FIG. 3 is a schematic diagram of the shape of an isolation member and an air guide member used in the present disclosure.

[0021] List of numerals: 1-outer tube, 11-air inlet, 2-sealing film, 3-aerosol generating material section, 4-isolation member, 41-central air guide hole, 42-side air guide groove, 5-air guide member, 51-central air channel, 52-side air channel, 6-filter section.

DETAILED DESCRIPTION

[0022] The present disclosure will be further described in detail below with reference to embodiments.

[0023] In order to have a better understanding of the objectives, the structures, and the functions of the present disclosure, a heat-not-burn aerosol generating product of the present disclosure are described in detail with reference to the accompanying drawings.

EMBODIMENT 1

[0024] As shown in FIG. 1, a heat-not-burn aerosol generating product includes:

an outer tube 1, which is formed by winding a paper material and has a first end and a second end, wherein the first end is commonly referred to as an upstream end or a far lip end, which is where the airflow first passes during suction, and the second end is commonly referred to as a downstream end or a near lip end, which is the airflow outlet during the suction;

an aerosol generating material section 3, which is a gathered tobacco sheet or a floc-free tobacco filament; and

an air guide member 5, which has a central air channel 51 arranged axially, wherein a cross-sectional shape of the central air channel 51 is not limited. The outer circumference of the air guide member 5 further has a gear shape, and an exemplary shape thereof is shown in FIG. 3. An air inlet 11 is provided on the side wall of the outer tube 1 surrounding the air guide member 5. A gap between each gear tooth on the outer periphery of the air guide member 5 and the inner wall of the outer tube 1 forms a side air channel 52. After each side air channel 52 extends a distance towards the upstream of the aerosol generating product, it communicates with the central air channel 51 at the upstream end surface of the air guide member 5, forming a U-shaped channel or a turn-back channel.

[0025] The near lip end of the heat-not-burn aerosol generating product in Embodiment 1 is not provided with a filter section. The filter section may be additionally provided at a mouthpiece of the aerosol generating device, and the near lip end of the aerosol generating product is in communication with the filter section to achieve a subsequent filtering effect.

[0026] When in use, the aerosol generating material section is heated to release the aerosol. When the user sucks at the near lip end of the outer tube, the external ambient air enters the side air channel 52 from the air inlet 11 and moves along the side air channel 52 towards the upstream end of the aerosol generating product, and encounters the aerosol at the upstream end surface of the air guide member 5, and carries the aerosol to turn into the central air channel, thereby completing the extraction and carrying of the aerosol, and then jointly flows downstream along the central air channel to the mouth of the user.

EMBODIMENT 2

[0027] As shown in FIG. 2, a heat-not-burn aerosol generating product includes an outer tube 1, and the outer tube 1 sequentially includes, from upstream to downstream:

an aerosol generating material section 3, which is a gathered tobacco sheet;

an isolation member 4, located immediately downstream of the aerosol generating material section 3, and having a central air guide hole 41 and/or a side air guide groove 42, with an exemplary shape shown in FIG. 3, wherein the cross-sectional shapes of the central air guide hole 41 and the side air guide groove 42 are not limited; and

air guide member 5, wherein the cross-sectional area of the air guide member 5 is smaller than the cross-sectional area of the outer tube 1, and the air guide member 5 has a central air channel 51 axially arranged. The cross-sectional shape of the central air channel is not limited. The outer circumference of the air guide member 5 has a gear shape, and an exemplary shape thereof is shown in FIG. 3. An air inlet 11 is provided on the side wall of the outer tube 1 surrounding the air guide member 5. A gap between each gear tooth on the outer circumference of the air guide member 5 and the inner wall of the outer tube 1 forms a side air channel 52. After extending a distance towards the upstream of the aerosol generating product, each side air channel 52 communicates with the central air channel 51 at the upstream end surface of the air guide member 5,

forming the U-shaped channel.

[0028] The heat-not-burn aerosol generating product in Embodiment 1 is provided with the filter section 6 at the near lip end and the sealing film 2 at the far lip end.

[0029] When in use, the aerosol generating material section is heated to release the aerosol. When the user sucks at the near lip end of the outer tube, the external ambient air enters the side air channel 52 from the air inlet 11 and moves along the side air channel 52 towards the upstream end of the aerosol generating product, and encounters the aerosol at the upstream end surface of the air guide member 5, and carries the aerosol to turn into the central air channel, thereby completing the extraction and carrying of the aerosol, and then jointly flows downstream along the central air channel to the mouth of the user.

[0030] It will be understood by those skilled in the art that, unless otherwise defined, all terms, including technical and scientific terms, used herein have the same meaning as those commonly understood by one of ordinary skill in the art to which the present disclosure belongs. It should also be understood that terms such as those defined in general dictionaries should be understood to have meanings consistent with those in the context of the prior art, and are not to be interpreted with idealized or overly formal meanings unless otherwise defined herein.

Claims

1. A heat-not-burn aerosol generating product, comprising an outer tube (1),
   wherein the following components are provided in the outer tube (1) from upstream to downstream:

   an aerosol generating material section (3); and an air guide member (5) disposed in the outer tube (1) and having a central air channel (51) axially arranged,
   wherein an air inlet (11) is provided on a side wall of the outer tube (1) surrounding the air guide member (5), and
   wherein a gap between an outer wall of the air guide member (5) and an inner wall of the outer tube (1) forms a side air channel (52) which is in communication with the central air channel (52) at an upstream end surface of the air guide member (5).

2. The heat-not-burn aerosol generating product of claim 1, wherein an isolation member (4) is provided between the aerosol generating material section (3) and the air guide member (5), and the isolation member (4) is provided with a central air guide hole (41) and/or a side air guide groove (42).

3. The heat-not-burn aerosol generating product of claim 1, wherein a far lip end of the outer tube (1) is provided with a sealing film (2), and/or, a wall of the outer tube (1) surrounding the aerosol generating material section (3) is airtight.

4. The heat-not-burn aerosol generating product of claim 1, wherein a periphery of the air guide member (5) is provided with at least one vent groove extending axially, and the side air channel (52) is formed between the vent groove and the inner wall of the outer tube (1).

5. The heat-not-burn aerosol generating product of claim 1, wherein the aerosol generating material section (3) contains an aerosol generating material which is filamentous, sheet-like, granular, or monolithic.

6. The heat-not-burn aerosol generating product of claim 1, wherein a filter section (6) is provided downstream of the air guide member (5).

7. The heat-not-burn aerosol generating product of claim 1, wherein the isolation member (4) and the air guide member (5) are each independently made of a silicone material or a ceramic material.

8. The heat-not-burn aerosol generating product of claim 1, wherein the air inlet (11) is an annular notch, an arc-shaped notch, or a scattered notch that penetrates a wall of the outer tube (1).

9. The heat-not-burn aerosol generating product of claim 1, wherein the outer tube (1) is formed by winding a paper or is a preformed paper tube.

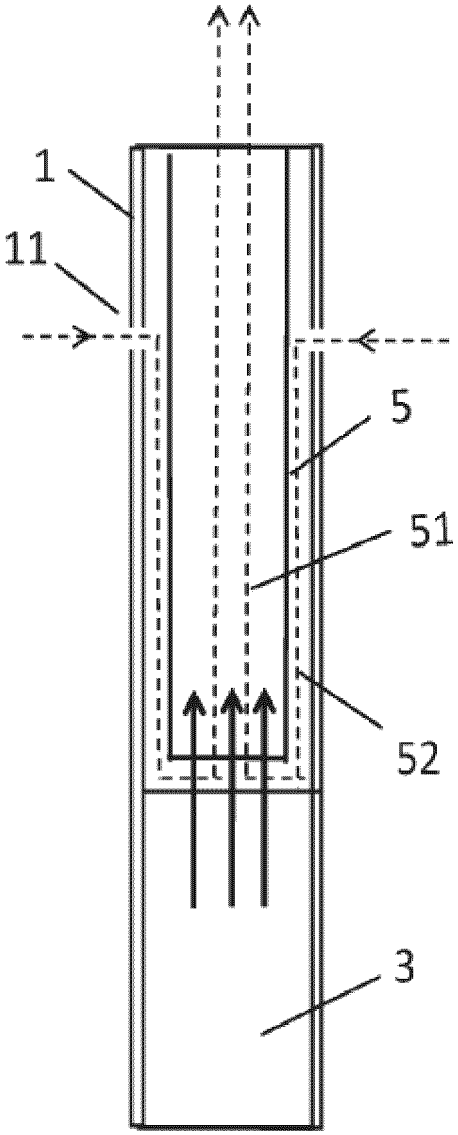

FIG. 1

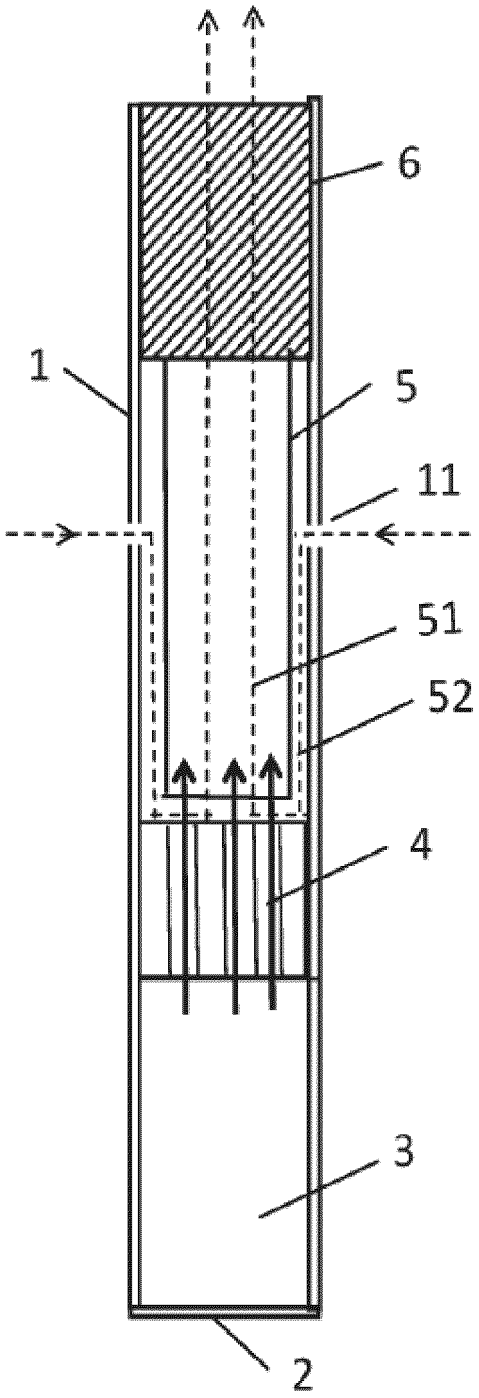

FIG. 2

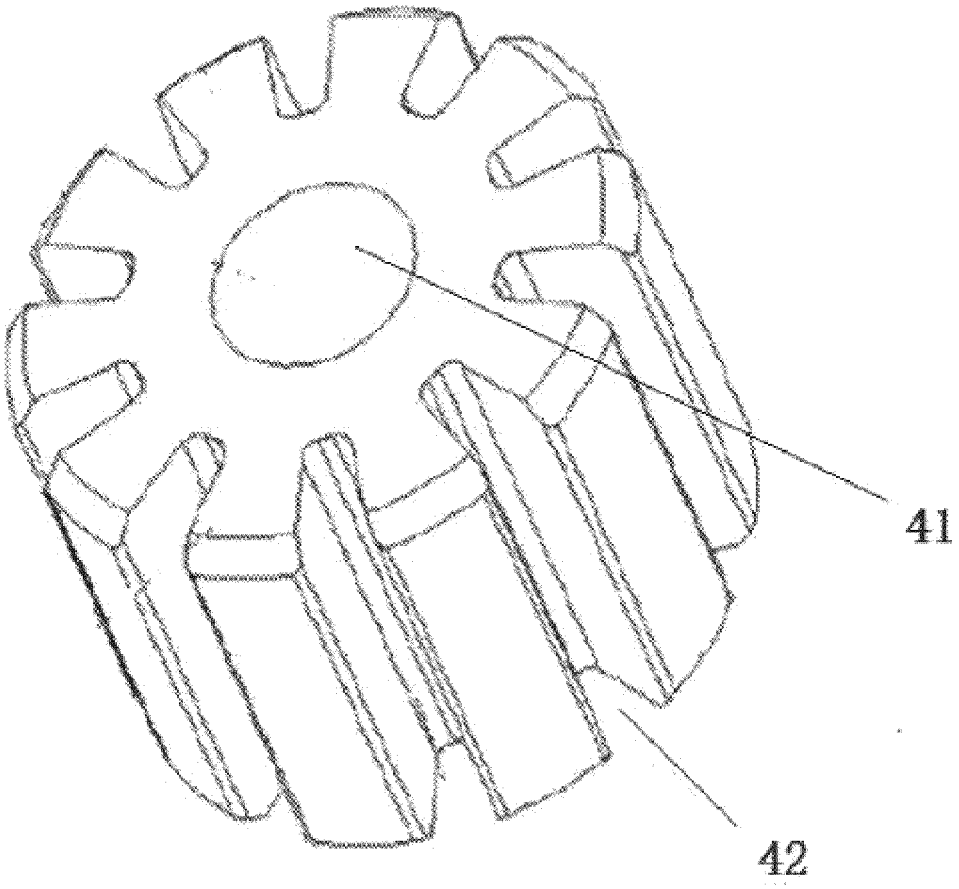

FIG. 3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2022/081119

A. CLASSIFICATION OF SUBJECT MATTER

A24D 1/02(2006.01)i; A24D 1/04(2006.01)i; A24D 1/20(2020.01)i; A24D 3/04(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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)

CNTXT; ENTXTC; ENTXT; DWPI; VEN: 不燃烧, 非燃烧, 烘烤, 烤烟, 导气, 口, 孔, 气道, 贫氧, 隔氧, 气溶胶, 烟草, heat-not-burn, non-burning, cur+, air guid+, hole?, inlet, outlet, air channel, low oxygen, oxygen-poor, aerosol, tobacco, cigarette

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	CN 217284735 U (SHENZHEN MAISHI TECHNOLOGY CO., LTD.) 26 August 2022 (2022-08-26) description, paragraphs 8-23, and figures 1-3	1-9
X	CN 104223364 A (SHENZHEN BAUWAY TECHNOLOGY CO., LTD.) 24 December 2014 (2014-12-24) description, paragraph 2 and paragraphs 17-29, and figure 1	1-9
X	CN 113558298 A (CHINA TOBACCO YUNNAN INDUSTRIAL CO., LTD. et al.) 29 October 2021 (2021-10-29) description, paragraphs 50-87, and figures 1-4	1-9
A	CN 212414699 U (CHINA TOBACCO YUNNAN INDUSTRIAL CO., LTD. et al.) 29 January 2021 (2021-01-29) entire document	1-9
A	CN 206994429 U (SHENZHEN YOSTA TECH CO., LTD.) 13 February 2018 (2018-02-13) entire document	1-9
A	CN 113556950 A (PHILIP MORRIS PRODUCTS S.A.) 26 October 2021 (2021-10-26) entire document	1-9

☑ 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
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"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
02 September 2022	**21 September 2022**
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** Facsimile No. **(86-10)62019451**	Authorized officer Telephone No.

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

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2022/081119

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2020029909 A1 (CHANGZHOU PATENT ELECTRONIC TECHNOLOGY CO., LTD.) 13 February 2020 (2020-02-13) entire document	1-9

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

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2022/081119

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
CN	217284735	U	26 August 2022	CN	114376265	A	22 April 2022
CN	104223364	A	24 December 2014	CN	104223364	B	18 January 2017
				CN	204132394	U	04 February 2015
				WO	2016033817	A1	10 March 2016
				EP	3213649	A1	06 September 2017
				US	2018035712	A1	08 February 2018
				EP	3213649	A4	20 June 2018
CN	113558298	A	29 October 2021	CN	212414723	U	29 January 2021
				CN	213307431	U	01 June 2021
				CN	113558296	A	29 October 2021
				WO	2021218025	A1	04 November 2021
				EP	4005422	A1	01 June 2022
CN	212414699	U	29 January 2021		None		
CN	206994429	U	13 February 2018		None		
CN	113556950	A	26 October 2021	WO	2020200693	A1	08 October 2020
				BR	112021017483	A2	23 November 2021
				KR	20210146945	A	06 December 2021
				EP	3945903	A1	09 February 2022
				US	2022192253	A1	23 June 2022
WO	2020029909	A1	13 February 2020	CN	208676379	U	02 April 2019
				EP	3834641	A1	16 June 2021
				EP	3834641	A4	18 May 2022

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