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(54) **PARTICLE TYPE AEROSOL GENERATING PRODUCT WITHOUT MULTI-THROUGH-HOLE FIXED MEMBER SEGMENT**

(57) The present disclosure discloses a granular aerosol generating product without using a multi-hole firmware section, including an outer sleeve (2), a sealing film (1) at the distal lip end plugging the outer sleeve (2), the product also includes an inner sleeve (3) inserted into the outer sleeve (2), the bottom of the inner sleeve (3) is sealed by a breakable plugging part (5), the downstream of the breakable plugging part (5) is a granule filling section filled with aerosol source-material granule (9), a fil-

tering section (4) is provided in the downstream of the granule filling section, and there is a distance between the breakable plugging part (5) and the sealing film (1) in the axial direction to form an original cavity section (8). The present disclosure also discloses a set combining an aerosol generating appliance with a barb on a heating element with the above-mentioned granular aerosol generating product without using a multi-hole firmware section.

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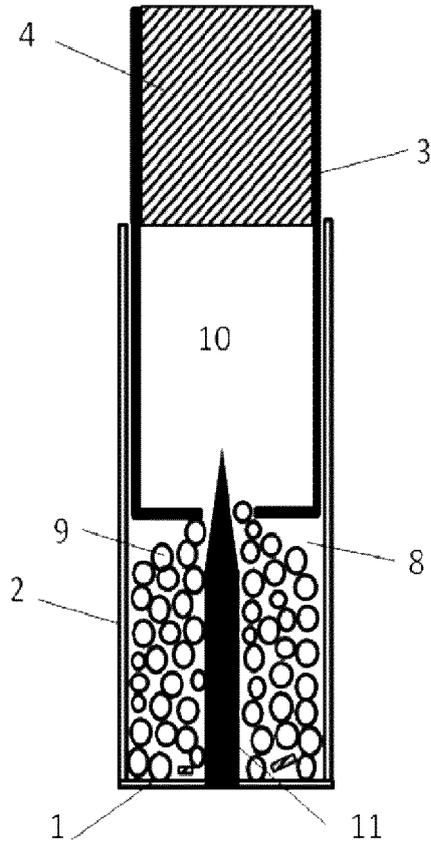


FIG4

Description

TECHNICAL FIELD

[0001] The present disclosure belongs to the technical field of aerosol generating product, and in particular, to an aerosol generating product by using aerosol source-material granules.

BACKGROUND

[0002] Aerosol granular generating products are a new type of Heat-Not-Burn (HNB) aerosol generating products in recent years, using aerosol source-material granules instead of aerosol source-material flakes as aerosol generating materials, as aerosol source-material granules are heated more evenly than aerosol source-material flakes, and aerosols diffuse more smoothly along the gap among granules than that among flake materials, they are deeply welcomed by consumers.

[0003] Granular aerosol generating products are known on the market, the structure is illustrated with reference to FIG. 1: the main structure is an integrated outer sleeve 2, the distal lip is sealed by the sealing film 1, which is filled with aerosol source-material granule 9 to form the granule section, a multi-hole firmware section (commonly known as "gear") 20 is set in the downstream of the granule section, and a cavity section 10 is set aside for collecting and accommodating aerosol (either the side walls of the cavity section 10 are also provided with air entry holes to cool the aerosol, or the cavity section is filled with cooling or flavoring materials to cool or flavor), the downstream of the cavity section 10 is a filtering section 4, which is also used as a cigarette holder for users to take in the mouth. When smoking cigarettes, the distal lip end is inserted into the heating appliance, the heating appliance has a central heating element to release gaseous aroma components by heating granules after piercing the sealing film 1 and inserting into the interior of the granule section, gaseous aroma components in the cavity section 10 are condensed into visible aerosol by cold air, and the aerosol is filtered in the filtering section and enters users' mouths.

[0004] Wherein, the cavity section 10 is crucial for aerosol formation, according to scientific theories of aerosol, gaseous aroma components released by heat need to be cooled and condense into solid or liquid granules, such solid or liquid granules need to be suspended in the air to form visible aerosol (commonly known as "smoke" or "fog" or generally known as "smog"). Thus, the cavity section must be left in the existing granular aerosol generating products.

[0005] Besides, as granules are loose and fluid, if not constrained, such granules may inevitably flow to the downstream of the cavity section on a large scale when the aerosol generating products are placed horizontally or inverted, resulting in the fact that granules that can be directly heated by the heating element greatly decrease,

the amount of aroma components and subsequent aerosol released may decrease; in order to ensure that granules are fully heated, such granules must be confined in a limited space near the heating element. Such constraint is currently achieved by setting a sealing film 1 in the upstream of the granule section and providing a multi-hole firmware section 20 in the downstream of the particle section, so that granules may not flow everywhere with constraints at both ends.

[0006] Wherein the multi-hole firmware section 20 is usually made of ceramic or silica gel, the outer wall is firmly bonded to the inner wall of the paper tube by adhesive, there is at least one axial through-hole 6 in the center and/or at least one peripheral ventilation groove 7 on the periphery, their sizes can allow smog while not allowing aerosol source-material granules to pass through; thus, blocking aerosol source-material granules and transmitting flue gas can be realized. In addition, when inserting a resistance heating sheet or an electromagnetic heating sheet into the granule section for central heating, as the multi-hole firmware section is firmly adhered to the inner wall of the paper tube, it can also prevent aerosol source material granules from pushing the multi-hole firmware section downstream with the insertion force of the heating sheet (since the filled granules have great resistance to insertion of the heating sheet, users need to exert an insertion force to the heating sheet to insert). However, existence of a multi-hole firmware section brings more costs and operational inconveniences to industrial manufacturing of granular aerosol generating products, thus, those skilled in the art have been hoping to eliminate the multi-hole firmware section. However, once eliminating the multi-hole firmware section, granule constraint is a problem under the premise that there must be a cavity section in the downstream of the granule section.

[0007] The present disclosure aims to solve the problems above.

SUMMARY

[0008] A first aspect of the present disclosure discloses a granular aerosol generating product without using a multi-hole firmware section, including an outer sleeve 2, a sealing film 1 that plugs the distal lip end of the outer sleeve 2, and an inner sleeve inserted into the outer sleeve 2, the bottom of the inner sleeve 3 is sealed by the breakable plugging part 5, and the downstream of the breakable plugging part 5 is a granule filling section filled with aerosol source-material granule 9, a filtering section 4 is provided in the downstream of the granule filling section, and there is a distance between the breakable plugging part 5 and the sealing film 1 in the axial direction to form an original cavity section 8.

[0009] Wherein, the upstream and downstream are determined by the direction of gas flow.

[0010] Preferably, the breakable plugging part 5 is a breakable plugging film or a compressed end of the gran-

ule section.

[0011] Preferably, the whole distal lip end of the inner sleeve 3 is plugged by the breakable plugging part 5, which is suitable for cylindrical inner sleeves, and more suitable for round-shaped inner sleeves radially contracted at the bottom; or, the distal lip end of the inner sleeve 3 has a bottom wall with a bottom through-hole 31, and the breakable plugging part 5 plugs the bottom through-hole 31, the size of the bottom through-hole 31 is larger than that of the aerosol source-material granule 9, so that granules leak from the bottom through-hole into the original cavity section 8. The technical solution with a bottom through-hole is more preferred, since the bottom wall of the inner sleeve can largely prevent backflow of granules from the bottom through-hole into the inner sleeve. In case a heating element with a tip is used, that is, the top size of the heating element is smaller than that of the main part, the heating element can be further pushed in the axial direction after all granules flow into the original cavity, so that the main part of the heating element is located at the bottom through-hole, the gap between the two can further prevent backflow of granules into the inner sleeve. Similarly, in case the round-shaped inner sleeve is used, the same effect can be achieved.

[0012] The filling amount of granules can be designed according to actual needs, e.g., most preferably, granules can be filled in the original cavity 10 and emptying the inner space of the inner sleeve; certainly, granules can also be left inside the inner sleeve after being filled in the original cavity 10.

[0013] The inner sleeve 3 can be fixed inside the outer sleeve 2 in any way, e.g., it can be fixed inside the outer sleeve 2 by adhesive or friction or through mechanical-structure coordination between them.

[0014] Preferably, the outer sleeve 2 or the inner sleeve 3 is an independently integral paper tube.

[0015] Preferably, the filtering section 4 is disposed inside the inner sleeve 3 or the outer sleeve 2.

[0016] Preferably, in an unheated state, the filtering section 4 is located immediately downstream of the granule section 3. Certainly, if necessary, an additional cavity can also be left between the granule section 3 and the filtering section 4.

[0017] A second aspect of the present disclosure discloses an aerosol generating appliance-aerosol generating product set, including an aerosol generating appliance with a heating element and a granular aerosol generating product without using a multi-hole firmware section, the heating element has a barb at the tip to prevent granules from backflowing into the inner sleeve.

[0018] A third aspect of the present disclosure discloses a method for using the granular aerosol generating product without a multi-hole firmware section in the first aspect of the present disclosure, including the following steps: pierce the sealing film 1 with a heating element and pierce the breakable plugging part 5, so that the aerosol source-material granule 9 is heated by the heating element after flowing into the original cavity section 8

through the pierced point, the space originally occupied by the aerosol source-material granule 9 is emptied out to form a new cavity section in situ, which is used to condense gaseous aroma components released by the aerosol source-material granule 9 after being heated to form aerosol, and leaves the granular aerosol generating product after being filtered in the filtering section 4.

[0019] The sealing film 1 can act as an extractor to ensure that when users pull out the aerosol generating product after smoking, the sealing film 1 holds all granules together to pull out with the aerosol generating product instead of scattering inside the aerosol generating appliance.

[0020] The technical solutions can be combined freely without contradiction.

[0021] The present disclosure has the following beneficial effects:

1. The multi-hole firmware section is eliminated, while granules can still be constrained at both ends: during storage, granules are constrained at both ends by the breakable plugging part 5 on the inner sleeve (if necessary, coordinating with the bottom wall of the inner sleeve) and the filtering section 4; while in the working state, both ends of granules are constrained by the gap between the sealing film 1 and the bottom wall of the inner sleeve or that between the heating element and the bottom through-hole.
2. The original granular aerosol generating product has four-sections (from the distal to the proximal lip end: the granule section, the multi-hole firmware section, the cavity section and the filtering section), it is necessary to fill the four sections in the same work site successively, resulting in longer working hours for a single finished product. While the present disclosure not only simplifies production by eliminating the multi-hole firmware section, but fill the granule section and the filtering section into the inner sleeve in place A and assemble them as independent pre-fabricated semi-finished products and transport to place B, the inner sleeve is inserted into the outer sleeve to obtain finished products, wherein, place A and place B can be same or different, such labor division will result in shorter working hours for a single finished product and higher production efficiency, and manufacturers can outsource part of their work.

DRAWINGS OF THE DESCRIPTION

[0022]

FIG. 1 is a structural schematic view of granular aerosol generating products in the prior art.

FIG.2 is a three-dimensional schematic view of multi-hole firmware section in granular aerosol generating products in the prior art.

FIG.3 is a structural schematic view of the granular

aerosol generated product without using a multi-hole firmware section of the present disclosure (before the heating element is inserted).

FIG.4 is a structural schematic view of the granular aerosol generated product without using a multi-hole firmware section of the present disclosure (after the heating element is inserted).

FIG.5 is a schematic view of the granular aerosol generated product with another structure without using the multi-hole firmware section of the present disclosure (before the heating element is inserted).

FIG.5 is a schematic view of the granular aerosol generated product with still another structure without using the multi-hole firmware section of the present disclosure (before the heating element is inserted).

FIG.7 is a structural schematic view of two heating elements with barbs.

[0023] List of the reference signs of figures:

1. Sealing film, 2. Outer sleeve; 3. Inner sleeve, 31. Bottom through-hole, 4. Filtering section, 5. Breakable plugging part, 6. Axial through-hole, 7. Peripheral ventilation groove, 8. Original cavity section, 9. Aerosol source-material granule, 10. New cavity section, 11. Heating element, 20.

Multi-hole firmware section.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0024] The present disclosure is further illustrated through specific embodiments.

Embodiment 1

[0025] As is shown in FIG. 3, a granular aerosol generating product without using a multi-hole firmware section of the present disclosure, including an outer sleeve (2), a sealing film (1) at the distal lip end plugging the outer sleeve (2), an inner sleeve (3) inserted into the outer sleeve (2), the bottom wall of the inner sleeve (3) has a bottom through-hole, which is sealed from the lower side of the through-hole by a starch-based breakable plugging part (5), the downstream of the breakable plugging part (5) is a granule filling section filled with aerosol source-material granule (9), a filtering section (4) is provided in the downstream of the granule filling section, and there is a distance between the breakable plugging part (5) and the sealing film (1) in the axial direction to form an original cavity section (8).

[0026] Furthermore, as is shown in FIG.4, pierce the sealing film (1) with a heating element (11) and pierce the breakable plugging part (5), the aerosol source-material granule (9) is heated by the heating element after flowing into the original cavity section (8) through the pierced point and filling the original cavity section (8), the space originally occupied by the aerosol source-material granule (9) is emptied out to form a new cavity section

(10) in situ, which is used to condense the gaseous aroma components released by the aerosol source-material granule (9) after being heated to form aerosol, and leaves the granular aerosol generating product after being filtered in the filtering section (4). As the bottom wall of the inner sleeve can largely prevent granules from back-flowing from the bottom through-hole into the inner sleeve.

[0027] The bottom wall of the inner sleeve can prevent backflow of granules into the inner sleeve; the heating element with a tip can further push the heating element in the axial direction after all granules flow into the original cavity so that the main part is located at the bottom through-hole, the gap between the two can further prevent backflow of granules into the inner sleeve; the heating element can also be provided with a bard as is shown in FIG.7; any one or combinations of these three factors can prevent granules from backflowing into the inner sleeve.

Embodiment 2

[0028] Basically, the same as embodiment 1, and the difference only lies in that the breakable plugging part 5 is located at the bottom through-hole, as is shown in FIG. 5.

Embodiment 3

[0029] Basically, the same as embodiment 1, and the difference only lies in that the inner sleeve has an inner-diameter contraction section, and the breakable plugging part 5 is a compacted granule plugging layer covering the entire lower end face of the inner sleeve, as is shown in FIG.6. The compacted granule plugging layer can withstand normal turbulence without breaking. After being punctured by the heating element, the lower end of the whole inner sleeve is open so as to allow granules to flow.

[0030] The above are only specific embodiments of the present disclosure; however, the protection scope of the present disclosure is not limited thereto, any technical personnel familiar with the technical field of the present disclosure can easily think of changes or replacements within the technical scope revealed by the present disclosure, which should be covered within the scope of protection of the present disclosure. Therefore, the protection scope of the present disclosure should be subject to the protection scope of the claims.

Claims

1. A granular aerosol generating product without using a multi-hole firmware section, comprising an outer sleeve (2), a sealing film (1) at the distal lip end plugging the outer sleeve (2), wherein, the product also comprises an inner sleeve (3) inserted into the outer sleeve (2), the bottom of the inner sleeve (3) is sealed by a breakable plugging part (5), the downstream of

- the breakable plugging part (5) is a granule filling section filled with aerosol source-material granule (9), a filtering section (4) is provided in the downstream of the granule filling section, and there is a distance between the breakable plugging part (5) and the sealing film (1) in the axial direction to form an original cavity section (8).
- 5
2. The granular aerosol generating product of claim 1, wherein, the breakable plugging part (5) is a breakable plugging film, or the compressed end of the granule section.
- 10
3. The granular aerosol generating product of claim 1, wherein, the whole distal lip end of the inner sleeve (3) is plugged by the breakable plugging part (5); or, the distal lip end of the inner sleeve (3) has a bottom wall with a bottom through-hole (31), and the breakable plugging part (5) plugs the bottom through-hole (31), the size of the bottom through-hole (31) is larger than that of the aerosol source-material granule (9).
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4. The granular aerosol generating product of claim 1, wherein, the inner sleeve (3) is fixed inside the outer sleeve (2) by adhesive or friction.
- 25
5. The granular aerosol generating product of claim 1, wherein, the outer sleeve (2) or the inner sleeve (3) is an independently integral paper tube.
- 30
6. The granular aerosol generating product of claim 1, wherein, the filtering section (4) is disposed inside the inner sleeve (3) or the outer sleeve (2).
- 35
7. The granular aerosol generating product of claim 1, wherein, in an unheated state, the filtering section (4) is located immediately downstream of the granule section (3).
- 40
8. An aerosol generating appliance-aerosol generating product set, wherein, the set comprises an aerosol generating appliance with a heating element and a granular aerosol generating product without using a multi-hole firmware section, the heating element has a barb at the tip.
- 45
9. A using method of the granular aerosol generating product without using a multi-hole firmware section of claim 1, wherein, the method comprises the following steps: pierce the sealing film (1) with a heating element and pierce the breakable plugging part (5), so that the aerosol source-material granule (9) is heated by the heating element after flowing into the original cavity section (8) through the pierced point, the space originally occupied by the aerosol source-material granule (9) is emptied out to form a new cavity section (10) in situ, which is used to condense the gaseous aroma components released by the aerosol source-material granule (9) after being heated to form aerosol, and leaves the granular aerosol generating product after being filtered in the filtering section (4).
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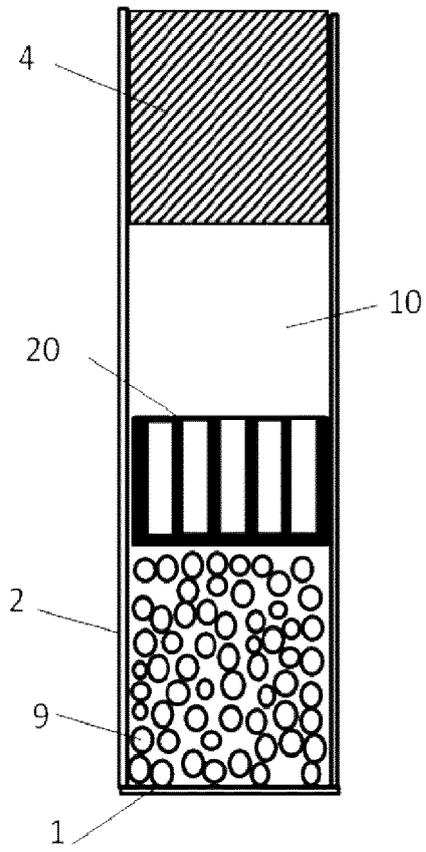


FIG.1

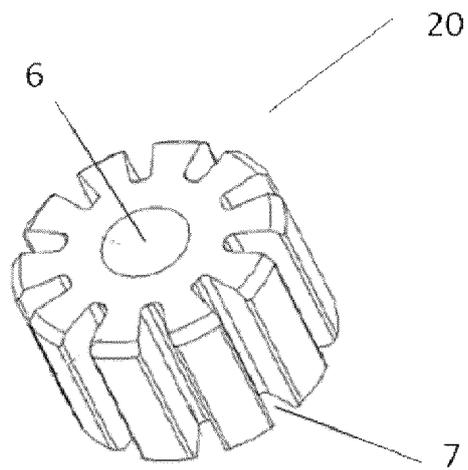


FIG.2

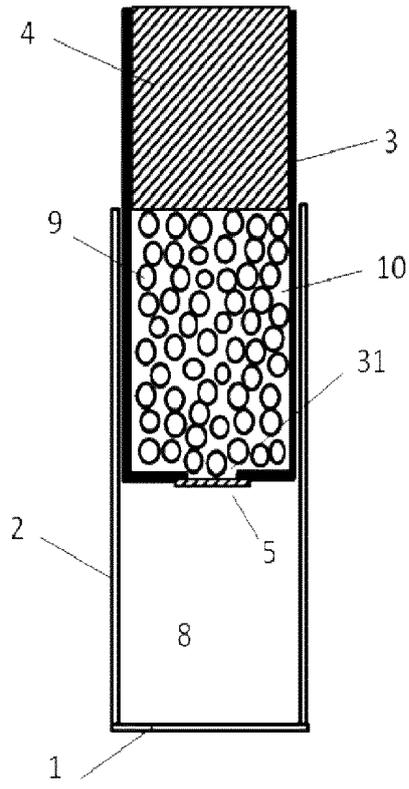


FIG. 3

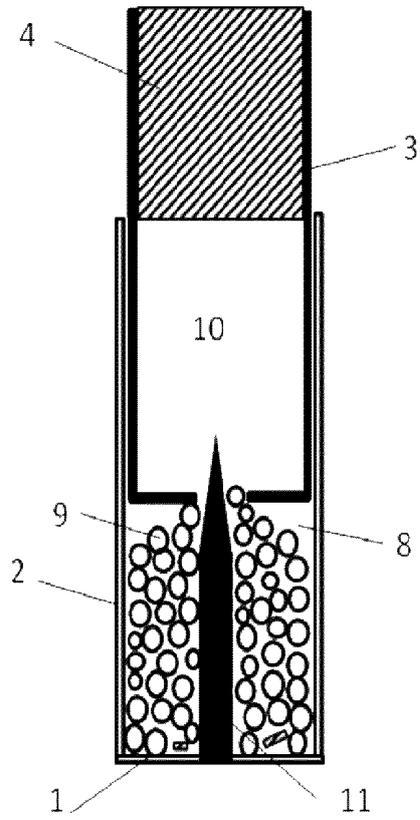


FIG. 4

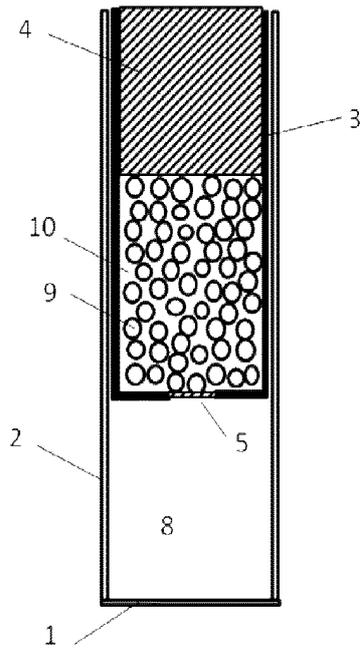


FIG. 5

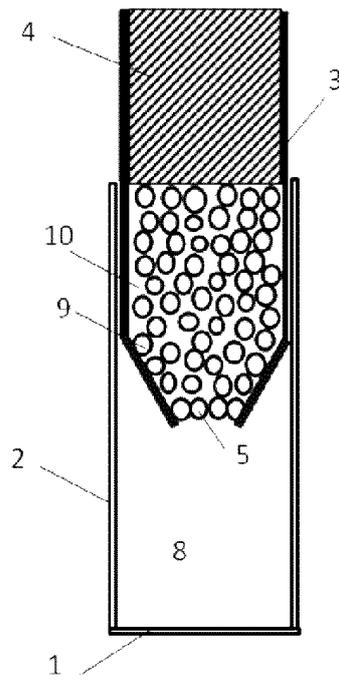


FIG. 6



FIG. 7

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2022/082992

5	A. CLASSIFICATION OF SUBJECT MATTER A24F 40/40(2020.01)i; A24F 40/46(2020.01)i; A24F 40/20(2020.01)i; A24D 3/17(2020.01)i; A24D 1/20(2020.01)i According to International Patent Classification (IPC) or to both national classification and IPC		
10	B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) A24F,A24D Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
15	Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) ENTXT, CNTXT, CNABS, CNKI, VEN, ENTXTC: 电子烟, 烟弹, 烟油, 发烟, 气溶胶, 套筒, 破碎, 刺碎, 刺破, 刺穿, 加热不燃烧, HNB, 空腔, 容纳腔, 滤嘴, 过滤, 降温, E-cigarette, cartridge, liquid, smoke, aerosol, crushing, pricking, piercing, heat-not-burn, HNB, cavity, receptacle, filter, filtering, cooling		
20	C. DOCUMENTS CONSIDERED TO BE RELEVANT		
	Category*	Citation of document, with indication, where appropriate, of the relevant passages	
		Relevant to claim No.	
	X	CN 202335348 U (XIU YUNQIANG) 18 July 2012 (2012-07-18) description, paragraphs 3-11, and figures 1-3	1-7, 9
25	X	CN 202919038 U (XIU YUNQIANG) 08 May 2013 (2013-05-08) description, paragraphs 3-12, and figures 1-2	1
	Y	CN 202335348 U (XIU YUNQIANG) 18 July 2012 (2012-07-18) description, paragraphs 3-11, and figures 1-3	8
30	Y	CN 107536116 A (SICHUAN SANLIAN NEW MATERIAL CO., LTD.) 05 January 2018 (2018-01-05) description, paragraphs 4-78, and figures 1-4	8,
	A	WO 2022018301 A1 (PHILIP MORRIS PRODUCTS SA) 27 January 2022 (2022-01-27) entire document	1-9
35	<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
40	* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family	
45	Date of the actual completion of the international search 29 November 2022	Date of mailing of the international search report 29 December 2022	
50	Name and mailing address of the ISA/CN China National Intellectual Property Administration (ISA/ CN) No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088, China	Authorized officer	
55	Facsimile No. (86-10)62019451	Telephone No.	

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