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(54) **METHOD FOR MANUFACTURING SHEET FOR SMOKING ARTICLE**

(57) The present disclosure relates to a method for manufacturing a sheet for a smoking article, and more particularly, to a method for manufacturing a sheet for a smoking article, the method comprising the steps of: putting a tobacco material into an aqueous solvent, and soaking and pressurizing it to separate a solid part and a liquid part (S1); removing the liquid part, forming a sheet with the solid part, and then drying and pulverizing the sheet (S2); preparing a slurry by mixing pulp with the pulverized sheet (S3); and injecting the slurry to form a sheet (S4), wherein the sheet has a reduced specific component, and the specific component includes one or more selected from the group consisting of nicotine and nitrate. A smoking article comprising the sheet manufactured by the above manufacturing method is characterized by having a reduced specific component and excellent flavor.

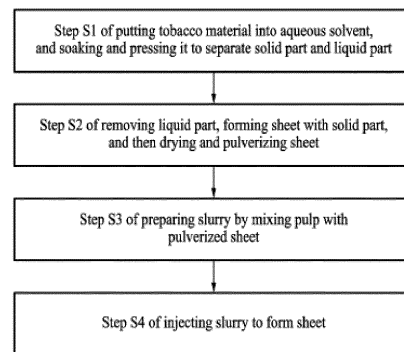


FIG. 1

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Description

Technical Field

5 [0001] The following description relates to a method for manufacturing a sheet for a smoking article, a sheet for a smoking article manufactured thereby, and a smoking article comprising the same.

Background Art

10 [0002] Tobacco stems and leaf pieces during the production and treatment of tobacco products, and tobacco stem by-products such as tobacco dust produced during the manufacturing process (i.e., stemming, aging, blending, cutting, drying, cooling, screening, forming, and packaging) can be recycled to reconstitute a useful tobacco content of the tobacco products. These tobacco by-products can be manufactured into a reconstituted tobacco sheet.

15 [0003] The reconstituted tobacco sheet may be cut in a manner similar to whole leaf tobacco and used as a suitable tobacco filler for cigarettes and other smoking articles, or the tobacco sheet itself may be used.

Related Art Document

Patent Document

20 [0004] (Patent Document 1) Korean Patent Publication No. 2020-0032505

Disclosure of the Invention

25 Technical Goals

[0005] The present disclosure provides a method for manufacturing a sheet for a smoking article, which has an excellent flavor while not containing a specific component, in which a solid part and a liquid part are separated from a tobacco material by utilizing a part of a paper-making process, and a sheet is manufactured using the solid part (cellulose) after removing the liquid part.

[0006] Further, the present disclosure provides a sheet for a smoking article, which is manufactured by the manufacturing method according to the present disclosure.

[0007] Further, the present disclosure provides a smoking article comprising the sheet for a smoking article according to the present disclosure.

35 [0008] However, the problems to be solved by the present disclosure are not limited to those mentioned above, and other problems not mentioned will be clearly understood by those skilled in the art from the description below.

Technical Solutions

40 [0009] According to one embodiment of the present disclosure, the present disclosure relates to a method for manufacturing a sheet for a smoking article, the method comprising the steps of:

putting a tobacco material into an aqueous solvent, and soaking and pressurizing it to separate a solid part and a liquid part (S1);

45 removing the liquid part, forming a sheet with the solid part, and then drying and pulverizing the sheet (S2);

preparing a slurry by mixing pulp with the pulverized sheet (S3); and

injecting the slurry to form a sheet (S4),

in which the sheet has a reduced specific component, and the specific component includes one or more selected from the group consisting of nicotine and nitrate.

50 [0010] According to one embodiment of the present disclosure, the step S1 may be performed by a method comprising the steps of: putting a tobacco material into an aqueous solvent, and heating it to 50°C to 90°C for 20 to 40 minutes (S1-1); and separating the solid part and the liquid part by pressurizing the heated mixture after the heating (S1-2).

[0011] According to one embodiment of the present disclosure, the tobacco material may include one or more selected from the group consisting of tobacco leaves, tobacco leaf pieces, tobacco stems, and tobacco dust.

55 [0012] According to one embodiment of the present disclosure, the method may further comprise a step of drying the sheet after the step S4.

[0013] According to one embodiment of the present disclosure, the tobacco material may be pulverized to an average

powder size of 0.03 mm to 0.30 mm.

[0014] According to one embodiment of the present disclosure, the method may further comprise a step of adding an aerosol-generating material to the sheet.

[0015] According to one embodiment of the present disclosure, the sheet for a smoking article may have a nicotine content of 1.0% or less.

[0016] According to one embodiment of the present disclosure, the sheet for a smoking article may have a nitrate content of 0.1% or less.

[0017] According to one embodiment of the present disclosure, the present disclosure relates to a sheet for a smoking article, which is manufactured by the manufacturing method according to the present disclosure.

[0018] According to one embodiment of the present disclosure, the present disclosure relates to a smoking article comprising the sheet according to the present disclosure.

Effects

[0019] In the manufacture of a sheet for a smoking article using a tobacco material according to the present disclosure, after the tobacco material is separated into a solid and a liquid as in a paper making-type reconstituted tobacco leaf process, the step of manufacturing a sheet with the separated solid is passed through, and then the sheet is dried, the dried sheet is pulverized, and a reconstituted tobacco leaf sheet is manufactured with a slurry in which the pulverized sheet is mixed with pulp, in which the sheet is characterized by excellently maintaining the flavor even when a specific component is removed.

Brief Description of Drawings

[0020] FIG. 1 shows a flowchart of a manufacturing method according to one embodiment of the present disclosure.

Best Mode for Carrying Out the Invention

[0021] Hereinafter, embodiments of the present disclosure will be described in detail with reference to the accompanying drawing. In describing the present disclosure, if it is determined that a detailed description of a related well-known function or configuration may unnecessarily obscure the gist of the present disclosure, the detailed description thereof will be omitted. Also, terms used in the present specification, as terms which are used so as to appropriately describe a preferred embodiment of the present disclosure, may be changed depending on the user's or operator's intention or the practices of the field to which the present disclosure pertains. Therefore, the definitions of the terms should be made based on the contents throughout the present specification. The same reference numerals disclosed in each drawing represent the same members.

[0022] Throughout the specification, when a member is said to be located "on" other member, this includes not only a case in which a member is in contact with other member but also a case in which another member exists between the two members.

[0023] Throughout the specification, when a part "includes" a certain component, it means that other components may be further included, rather than excluding other components.

[0024] Hereinafter, a method for manufacturing a sheet for a smoking article according to the present disclosure will be described in detail with reference to embodiments and drawings. However, the present disclosure is not limited to these embodiments and drawings.

[0025] The present disclosure relates to a method for manufacturing a sheet for a smoking article, the method comprising the steps of:

putting a tobacco material into an aqueous solvent, and soaking and pressurizing it to separate a solid part and a liquid part (S1);

removing the liquid part, forming a sheet with the solid part, and then drying and pulverizing the sheet (S2);

preparing a slurry by mixing pulp with the pulverized sheet (S3); and

injecting the slurry to form a sheet (S4),

in which the sheet has a reduced specific component, and the specific component includes one or more selected from the group consisting of nicotine and nitrate.

[0026] In the present disclosure, the "smoking article" may mean a smokeable any product or any product that can provide a smoking experience regardless of whether or not it is based on tobacco, tobacco derivatives, expanded tobacco, reconstituted tobacco, or tobacco substitutes. For example, the smoking article may mean a smokeable article capable of generating an aerosol, such as a cigarette, cigar, cigarillo, electronic cigarette (e.g., heating type), or the like,

and particularly, it may include non-combustion heating type smoking articles.

[0027] According to one embodiment of the present disclosure, the step S1 adopts a part of the papermaking-type reconstituted tobacco leaf manufacturing method, and the step S 1 may be performed by a method comprising the steps of: putting a tobacco material into an aqueous solvent and heating it to 50°C to 90°C for 20 to 40 minutes (S 1-1); and separating it into a solid part and a liquid part by pressurizing the heated mixture after the heating (S 1-2). In the present disclosure, after separating it into the solid part and the liquid part as described above, and pulverizing the sheet manufactured of only the solid part, the pulverized sheet is manufactured into a sheet for a smoking article through a slurry process.

[0028] Conventional reconstituted tobacco leaf sheets for smoking articles have been manufactured by a papermaking-type or slurry-type manufacturing process. The papermaking-type manufacturing process is performed by pulverizing the tobacco material and mixing the pulverized tobacco material with an aqueous solvent and separating a solid part containing cellulose and a liquid part (extract) containing a large amount of a specific component to manufacture the fiber into a sheet form in a papermaking manner, and concentrating the separated extract and adding the concentrated extract to the sheet.

[0029] However, differently from this, a sheet for a smoking article is manufactured in the present disclosure using the sheet after manufacturing it into a sheet using only the separated solid part without the step of adding the concentrated extract.

[0030] That is, the sheet for a smoking article manufactured by the above manufacturing method can maintain excellent flavor even though a specific component is reduced.

[0031] According to one embodiment of the present disclosure, the tobacco material may be one or more selected from the group consisting of tobacco leaves, tobacco leaf pieces, tobacco stems, and tobacco dust. Preferably, it may be tobacco leaves.

[0032] According to one embodiment of the present disclosure, the pulverization of the step S2 may be performing pulverization to an average powder size of 0.03 mm to 0.30 mm. The pulverization may be performed using equipment such as a hammer mill, a cutter head, an air control mill, and the like. The tobacco material on which the pulverization is performed may be pulverized when the moisture content is less than about 15% by weight to less than about 5% by weight.

[0033] According to one embodiment of the present disclosure, in the step S3, water is added to the pulverized sheet to be beaten and dissociated, and the pulp is mixed to prepare a slurry.

[0034] According to one embodiment of the present disclosure, in step S4, a process such as adding a concentrated solution obtained by concentrating the liquid part separated in the step S 1 is excluded, and the slurry is manufactured into a sheet as it is.

[0035] If the manufacturing method is a method of manufacturing the sheet by injecting a slurry, or a method capable of manufacturing the slurry into a sheet form, it can be performed without being limited to the injection method.

[0036] According to one embodiment of the present disclosure, the method may further comprise a step of drying the sheet after the step S4. The moisture content of a sheet manufactured from the slurry may be reduced to less than 50% by weight. After drying, a moisturizer may be added, and at this time, the content of the moisturizer may be more than 5% by weight and less than 40% by weight.

[0037] According to one embodiment of the present disclosure, the method may further comprise a step of adding an aerosol-generating material to the sheet. The aerosol-generating material may include, for example, at least one of glycerin, propylene glycol, ethylene glycol, dipropylene glycol, diethylene glycol, triethylene glycol, tetraethylene glycol, and oleyl alcohol. The aerosol-generating material may generate an aerosol by being heated by a combustion method or a heating method.

[0038] According to one embodiment of the present disclosure, the sheet manufactured by the manufacturing method may have a nicotine content of 1.0% or less and a nitrate content of 0.1% or less.

[0039] Furthermore, the present disclosure may provide a sheet for a smoking article, manufactured by the manufacturing method, and may provide a smoking article comprising the sheet.

[0040] According to one embodiment of the present disclosure, the smoking article may comprise a cooling part and a filter part, and may be composed of a smoking material part to which the sheet for a smoking article according to the present disclosure is applied. The smoking article may be aligned in a longitudinal direction, and the smoking material part, the cooling part, and the filter part may be aligned in the longitudinal direction, but the order can be freely changed.

[0041] For example, the smoking material part may have a length of approximately 15 mm to 35 mm. The smoking material part may contain other tobacco materials besides the sheet for a smoking article. The other tobacco materials may be tobacco leaves, tobacco lateral vein, expanded tobacco, cut tobacco, etc., and the smoking material part may be disposed to be surrounded by a thermally conductive wrapper, wrapping paper, and the like. The thermally conductive wrapper may be formed of aluminum (Al), gold (Au), iron (Fe), nickel (Ni), cobalt (Co), conductive carbon (C), graphite, mild steel, stainless steel, copper (Cu), or bronze. The thermally conductive wrapper may have a thickness of several μm to hundreds of μm , but is not necessarily limited thereto. The thermally conductive wrapper may uniformly transfer

the heat generated by the heating means to the smoking material part.

[0042] For example, the cooling part can cool an airflow formed by an aerosol generated from the smoking material part, may be made of a polymeric material or a biodegradable polymeric material, and may have a cooling function. For example, it may be made of polylactic acid (PLA) fibers, but is not limited thereto. Alternatively, it may be made of a cellulose acetate filter perforated with a plurality of holes. However, the cooling part is not limited to the above-described example, and a material performing a function of cooling the aerosol may correspond thereto without limitation. For example, the cooling part may be a hollow-containing tube filter or a paper tube filter.

[0043] For example, the filter part may be a mono filter, a double filter, or a triple filter. In addition, the filter part may include at least one filter of a porous matrix structure, a tube structure, and a paper tube structure. The filter part may be selected within a length range of: 5 mm to 20 mm; or 10 mm to 15 mm.

[0044] The filter is comprised of a filter tow known in the art of the present disclosure, and may comprise, for example, a filter tow including a fibrous phase, filament phase, or both thereof containing at least one of polymer, paper, cellulose acetate, activated carbon, and carbon, but is not limited thereto.

[0045] In addition to this, the filter may further comprise a tipping paper in contact with the mouth, which surrounds the filter material. The tipping paper may have one or more perforations formed therein.

[0046] The filter part may be manufactured to generate flavor. As an example, a flavoring liquid may be sprayed onto the filter material, and a separate fiber coated with the flavoring liquid may be inserted into the filter part.

[0047] The cooling part and the filter part may contain an aerosol modifier. For example, one or more of the cooling part, filter part, and tipping paper of the smoking article according to the present disclosure may contain one or more aerosol modifiers. Suitable aerosol modifiers may not be limited thereto, but may include a flavoring agent and a chemesthetic agent. The flavoring agent is used to describe any substance that, when used, imparts taste, aroma, or both thereof to aerosols generated by the tobacco material and aerosol-generating material of the smoking article.

[0048] In addition, the cigarette paper is composed of cellulose fibers obtained from wood, flax, or other materials, and may be wrapped around a medium part, wrapped around the entire smoking article comprising the medium part, or wrapped around a part except for the filter part. The base paper of the cigarette paper may have a thickness of about 30 μm to about 100 μm , and the base paper may have a basis weight of about 15 g/m² to about 80 g/m².

[0049] The smoking article according to the present disclosure may also comprise downstream one or more aerosol modifiers that are both a flavoring agent and a chemesthetic agent. For example, one or more of the cooling part and filter part of the smoking article according to the present disclosure may contain menthol or another flavoring agent that provides a cooling object sensory effect.

[0050] The smoking article may have a diameter of 4 mm to 10 mm and a circumference of 14 mm to 29 mm. In addition, the smoking article may have a length of 45 mm to 100 mm.

[0051] Hereinafter, Embodiments will be described in detail with reference to the accompanying drawing. However, since various changes can be made to the Embodiments, the scope of rights of the patent application is not restricted or limited by these Embodiments. It should be understood that all changes, equivalents or substitutes to the Embodiments are included within the scope of rights.

[0052] Terms used in the Embodiments are used only for descriptive purposes and should not be construed as an intention of limiting the present disclosure. Singular expressions include plural expressions unless the context clearly dictates otherwise. In this specification, terms such as "include" or "have" are intended to designate that there is a feature, number, step, operation, component, part, or combination thereof described in the specification, but it should be understood that the presence or addition of one or more other features, numbers, steps, operations, components, parts, or combinations thereof is not precluded.

[0053] Unless defined otherwise, all terms used herein, including technical or scientific terms, have the same meaning as commonly understood by a person of ordinary skill in the art to which the Embodiments belong. Terms such as those defined in commonly used dictionaries should be interpreted as having a meaning consistent with the meaning in the context of the related art, and unless explicitly defined in the present application, they should not be interpreted in an ideal or excessively formal meaning.

[0054] In addition, in the description with reference to the accompanying drawing, the same reference numerals are given to the same components regardless of reference numerals, and overlapping descriptions thereof will be omitted. In describing Embodiments, if it is determined that a detailed description of a related known technology may unnecessarily obscure the gist of the Embodiments, the detailed description will be omitted.

[Embodiment]

Embodiment 1

[0055] A tobacco material was put into an aqueous solvent having a temperature of about 70°C, soaked for about 30 minutes and pressed to separate the pressurized mixture into solid (cellulose) and liquid (extract). The separated solid

was formed into a sheet and cut into small pieces after drying. The cut raw material was pulverized, and the pulverized raw material was put into water and pulped to prepare a slurry. After the slurry was injected to manufacture the slurry into a sheet form, it was dried to complete a sheet for a smoking article.

Comparative Embodiment 1

[0056] Flue-cured tobacco

Comparative Embodiment 2

[0057] Reconstituted tobacco leaves prepared by the slurry-type manufacturing process

Comparative Embodiment 3

[0058] Reconstituted tobacco leaves prepared by the papermaking-type manufacturing process

<Component confirmation>

[0059] For the manufactured sheet, the content was analyzed using chromatography. The analyzed results are shown in Table 1 below. In addition, Comparative Embodiments 1, 2, and 3, and Embodiment 1 were prepared using the same cut tobacco.

[Table 1]

Classification	Nicotine (%)	Total sugar (%)	NO ₃ (%)	Chlorine (%)	Remarks
Comparative Embodiment 1	4.06	14.7	0.13	0.49	Cut tobacco
Comparative Embodiment 2	3.27	10.89	0.10	0.37	Reconstituted tobacco leaves prepared by the slurry-type manufacturing process
Comparative Embodiment 3	2.67	11.51	0.07	0.40	Reconstituted tobacco leaves prepared by the papermaking-type manufacturing process
Embodiment 1	0.20	0.2	0.03	0.12	

[0060] From the results of Table 1, it can be confirmed that the nicotine and nitrate contents of the reconstituted tobacco leaves prepared by the method according to the present disclosure are significantly reduced in Embodiment 1 compared to Comparative Embodiments.

<Flavor check>

[0061] A non-combustion type smoking article comprising a cooling element and a filter part was manufactured of the manufactured sheet.

[0062] The flavor of the tobacco prepared in Embodiment 1 and Comparative Embodiments 1 to 3 was evaluated through a panel of 20 people and shown in Table 2 below.

[Table 2]

Classification	Tobacco flavor	Rich smoke amount	Tobacco flavor intensity	Taste and odor	Irritation
Comparative Embodiment 1	4.6	4.7	4.8	3.2	3.4

(continued)

Classification	Tobacco flavor	Rich smoke amount	Tobacco flavor intensity	Taste and odor	Irritation
Comparative Embodiment 2	4.6	4.6	4.3	3.9	3.9
Comparative Embodiment 3	3.5	4.6	4.2	4.2	3.3
Embodiment 1	4.0	4.7	2.4	2.5	1.5

[0063] From the results of Table 2, it was found that there was little difference in the abundant smoking amount between the smoking article of Embodiment 1 in which the specific component was reduced and the smoking article of Comparative Embodiment 1 containing cut tobacco. In addition, the smoking article of Embodiment 1 showed similar results in tobacco flavor to the smoking articles of Comparative Embodiments 2 and 3.

[0064] In the smoking article of Embodiment 1 compared to the smoking article of Comparative Embodiment 1, the tobacco flavor intensity was insufficient, but remarkably excellent results were confirmed in terms of taste and odor, and irritation.

[0065] Therefore, it was confirmed that the smoking article of Embodiment 1 showed results similar to or superior to those of conventional smoking articles in terms of overall tobacco flavor even though the specific component was reduced.

[0066] Although the embodiments have been described with reference to the limited Embodiments and drawing as described above, various modifications and variations are possible from the above description by one of ordinary skill in the art. For example, appropriate results can be achieved although described techniques are performed in order different from a described method, and/or described elements are joined or combined in a form different from the described method, or replaced or substituted by other elements or equivalents. Therefore, other embodiments, other Examples, and equivalents to the scope of claims also belong to the scope of the claims to be described later.

Claims

1. A method for manufacturing a sheet for a smoking article, the method comprising the steps of:

putting a tobacco material into an aqueous solvent, and soaking and pressurizing it to separate a solid part and a liquid part (S1);
removing the liquid part, forming a sheet with the solid part, and then drying and pulverizing the sheet (S2);
preparing a slurry by mixing pulp with the pulverized sheet (S3); and
injecting the slurry to form a sheet (S4),
wherein the sheet has a reduced specific component, and the specific component includes one or more selected from the group consisting of nicotine and nitrate.

2. The method of claim 1, wherein the step S1 is performed by a method comprising the steps of: putting a tobacco material into an aqueous solvent, and heating it to 50°C to 90°C for 20 to 40 minutes (S1-1); and separating the solid part and the liquid part by pressurizing the heated mixture after the heating (S1-2).

3. The method of claim 1, wherein the tobacco material includes one or more selected from the group consisting of tobacco leaves, tobacco leaf pieces, tobacco stems, and tobacco dust.

4. The method of claim 1, further comprising a step of drying the sheet after the step S4.

5. The method of claim 1, wherein the tobacco material is pulverized to an average powder size of 0.03 mm to 0.30 mm.

6. The method of claim 1, further comprising a step of adding an aerosol-generating material to the sheet.

7. The method of claim 1, wherein the sheet for a smoking article has a nicotine content of 1.0% or less.

8. The method of claim 1, wherein the sheet for a smoking article has a nitrate content of 0.1% or less.

9. A sheet for a smoking article, which is manufactured by the manufacturing method of any one of claims 1 to 8.
10. A smoking article comprising the sheet of claim 9.

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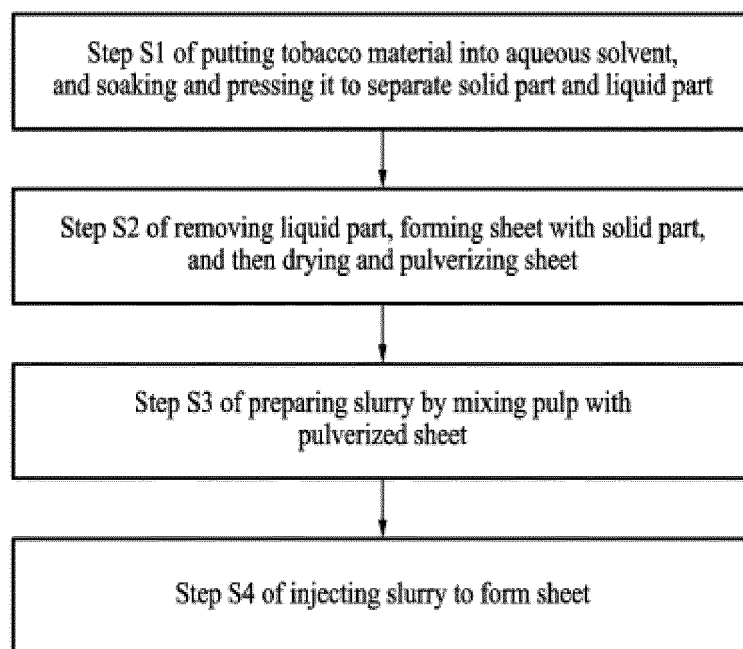


FIG. 1

TRANSLATION

INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2022/019006

A. CLASSIFICATION OF SUBJECT MATTER

A24B 3/14(2006.01)i; A24B 3/18(2006.01)i; A24B 7/00(2006.01)i; A24B 15/12(2006.01)i; A24B 15/14(2006.01)i;
A24D 1/00(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)

A24B 3/14(2006.01); A24B 15/12(2006.01); A24B 15/26(2006.01); A24D 1/00(2006.01)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models: IPC as above

Japanese utility models and applications for utility models: IPC as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS (KIPO internal) & keywords: 담배 시트(tobacco sheet), 환상엽(reconstituted tobacco sheet), 액체분리(liquid separation), 펄프(pulp), 슬러리(slurry), 분쇄(pulverization)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Y	KR 10-2021-0115609 A (KT & G CORPORATION) 27 September 2021 (2021-09-27) See abstract; paragraphs [0010], [0017]-[0018], [0054]-[0058], [0072] and [0097]; and tables 1-2.	1-10
A	JP 02-049572 A (R. J. REYNOLDS TOBACCO COMPANY) 19 February 1990 (1990-02-19) See entire document.	1-10
A	US 2008-0216854 A1 (NICHOLLS, Juan G. et al.) 11 September 2008 (2008-09-11) See entire document.	1-10
A	KR 10-2021-0102266 A (PHILIP MORRIS PRODUCTS S.A.) 19 August 2021 (2021-08-19) See entire document.	1-10

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:	"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
"A" document defining the general state of the art which is not considered to be of particular relevance	"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
"D" document cited by the applicant in the international application	"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
"E" earlier application or patent but published on or after the international filing date	"&" document member of the same patent family
"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	

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TRANSLATION

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/KR2022/019006

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Form PCT/ISA/210 (patent family annex) (July 2022)

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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