



(11) **EP 4 218 435 A1**

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
02.08.2023 Bulletin 2023/31

(21) Application number: **22879583.7**

(22) Date of filing: **23.11.2022**

(51) International Patent Classification (IPC):
A24D 3/06 (2006.01) **A24D 3/10** (2006.01)
A24D 3/04 (2006.01) **A24D 3/02** (2006.01)
A24B 15/32 (2006.01) **A24D 1/04** (2006.01)
A24D 1/20 (2020.01) **A24F 40/20** (2020.01)

(86) International application number:
PCT/KR2022/018585

(87) International publication number:
WO 2023/113279 (22.06.2023 Gazette 2023/25)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
KH MA MD TN

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(30) Priority: **16.12.2021 KR 20210180761**

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(54) **WOVEN FABRIC FILTER INCLUDING FLAVORING SHEET AND SMOKING ARTICLE INCLUDING SAME**

(57) The present disclosure relates to a woven fabric filter including a flavored sheet and a smoking article including the same, and more particularly, to a woven fabric filter including a flavored sheet fiber that is a fiber ob-

tained by cutting a flavored sheet and that includes a cellulose-based polymer, a plasticizer, and a flavoring material, and to a smoking article including the same.

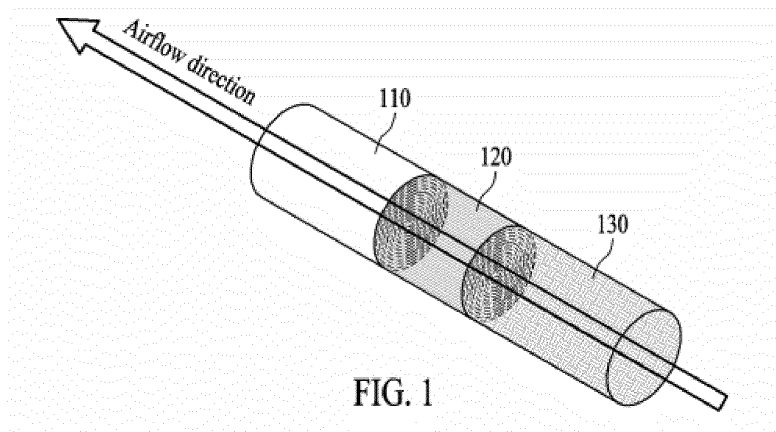


FIG. 1

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Description

Technical Field

[0001] The present disclosure relates to a woven fabric filter including a flavored sheet, and a smoking article including the same.

Background Art

[0002] In the case of a heating-type stick product, heating using a dedicated device is essential for an expression of a smoking taste of a medium portion (including a smoking taste and aerosol generating article with raw tobacco materials such as cut tobacco leaves, fragrant materials, and the like). In the case of devices dedicated for heating-type sticks that have been developed until now to express a smoking taste, a temperature program is designed to enable high-temperature heating in consideration of a heat transfer to the inside of the medium portion. The heating temperature is typically in a range of 200°C to 400°C. Unlike traditional cigarettes, which enable inhalation by burring cut leaves, a large amount of water vapor is released together when a stick of the medium portion is heated through a device. The temperature level inside the medium portion through heating ranges from 100°C to 200°C. If there is no cooling material downstream of the medium portion and temperatures of airflows generated inside the medium portion are similar, a smoker may inhale hot air.

[0003] Polymer materials (e.g., a polylactic acid (PLA), cellulose acetate (CA), poly(ethylene terephthalate) (PET), etc.) capable of being changed in phase by absorbing heat within an airflow temperature range, as cooling materials of heating-type sticks that have been developed, are applied to the entire cross section of a filter in the form of weaving materials, and the like. A form formed by spinning PLA and twisting the spun PLA into a woven fabric was applied to a product to be released, but the production efficiency is low due to very expensive product materials and an extremely small amount of product material that may be produced per hour.

[0004] Therefore, research for the development of cooling materials to improve the economic feasibility and a function of a new heating-type stick is being actively conducted.

Disclosure of the Invention

Technical Goals

[0005] To solve the above-mentioned problems, the present disclosure provides a woven fabric filter with a production efficiency and price competitiveness while enhancing a cooling effect and a flavor of a smoking article by applying a flavored sheet with a cooling effect and a flavor expression effect.

[0006] The present disclosure provides a smoking ar-

ticle including a woven fabric filter according to the present disclosure.

[0007] However, the technical goal obtainable from the present disclosure is not limited to the above-mentioned technical goal, and other unmentioned technical goals may be clearly understood from the following description by one of ordinary skill in the art to which the present disclosure pertains.

10 Technical Solutions

[0008] According to an embodiment of the present disclosure, a woven fabric filter including a flavored sheet fiber is provided. The flavored sheet fiber may be a fiber obtained by cutting a flavored sheet, and the flavored sheet may include a cellulose-based polymer, a plasticizer, and a flavoring material.

[0009] According to an embodiment of the present disclosure, the cellulose-based polymer may be in an amount of 20% by weight (wt%) to 60 wt% in the flavored sheet.

[0010] According to an embodiment of the present disclosure, the plasticizer may be in an amount of 1 wt% to 20 wt% in the flavored sheet.

[0011] According to an embodiment of the present disclosure, the flavoring material may be in an amount of 10 wt% to 50 wt% in the flavored sheet.

[0012] According to an embodiment of the present disclosure, the flavored sheet may have a thickness of 1 millimeter (mm) or less.

[0013] According to an embodiment of the present disclosure, the flavored sheet may have a tensile strength of 1.0 kilogram-force (kgf)/15 mm or greater.

[0014] According to an embodiment of the present disclosure, the cellulose may include at least one selected from a group consisting of methyl cellulose, ethyl cellulose, carboxymethyl cellulose, carboxyethyl cellulose, hydroxymethyl cellulose, hydroxyethyl cellulose, hydroxypropyl cellulose, hydroxypropylmethyl cellulose, hydroxyethylmethyl cellulose, and agar.

[0015] According to an embodiment of the present disclosure, the plasticizer may include at least one selected from a group consisting of propylene glycol, polyethylene glycol, dipropylene glycol, diethylene glycol, triethylene glycol, tetraethylene glycol, glycerin, and sorbitol.

[0016] According to an embodiment of the present disclosure, the fiber may have a diameter of 1 mm or less.

[0017] According to an embodiment of the present disclosure, a smoking article including a filter portion including a woven fabric filter according to the present disclosure is provided.

[0018] According to an embodiment of the present disclosure, the woven fabric filter may have a circumference of 14 mm to 25 mm and a length of 5 mm to 20 mm.

[0019] According to an embodiment of the present disclosure, the smoking article may be a cigarette or an electronic cigarette, and may be in the form of a cigarette.

[0020] According to an embodiment of the present dis-

closure, the filter portion may include a first filter; and a second filter including the woven fabric filter.

[0021] According to an embodiment of the present disclosure, the filter portion may include a first filter, a second filter including the woven fabric filter, and a third filter including a tube filter or a paper tube filter; or a first filter, a second filter including a tube filter or a paper tube filter, and a third filter including the woven fabric filter.

[0022] According to an embodiment of the present disclosure, the first filter may include a fibrous form, a filamentous form, or both, and the fibrous form and the filamentous form may each include at least one of a polymer, paper, cellulose acetate, activated carbon, and carbon. Effects

[0023] In the present disclosure, a flavored sheet fiber may be introduced into a woven fabric filter, to provide an airflow cooling effect and a flavor expression effect, and thus it is possible to enhance persistence of a smoking taste and a tobacco taste. For example, since an aroma and/or flavor are expressed from an intermediate portion of a heating-type electronic cigarette to a rear portion by the woven fabric filter, the persistence of the smoking taste and the tobacco taste may be enhanced.

Brief Description of Drawings

[0024]

FIG. 1 illustrates an example of a smoking article to which a woven fabric filter according to the present disclosure is applied, according to an embodiment of the present disclosure.

FIG. 2 illustrates another example of a smoking article to which a woven fabric filter according to the present disclosure is applied, according to an embodiment of the present disclosure.

FIG. 3 illustrates another example of a smoking article to which a woven fabric filter according to the present disclosure is applied, according to an embodiment of the present disclosure.

Best Mode for Carrying Out the Invention

[0025] Hereinafter, embodiments of the present disclosure will be described in detail with reference to the accompanying drawings. When it is determined detailed description related to a related known function or configuration they may make the purpose of the present disclosure unnecessarily ambiguous in describing the present disclosure, the detailed description will be omitted here. In addition, terminologies used herein are defined to appropriately describe the embodiments and thus may be changed depending on a user, the intent of an operator, or a custom of a field to which the present disclosure pertains. Accordingly, the terminologies must be defined based on the following overall description of the present specification. In the drawings, like reference numerals are used for like elements.

[0026] In the whole specification, when one member is positioned "on" another member, this not only includes a case that the one member is brought into contact with the other member, but also includes a case that another member exists between two members.

[0027] It will be understood that when a certain part "includes" a certain component, the part does not exclude another component but may further include another component.

[0028] Hereinafter, a woven fabric filter and a smoking article including the woven fabric filter according to the present disclosure will be described in detail with reference to embodiments and drawings. However, the present disclosure is not limited to the embodiments and drawings.

[0029] The present disclosure relates to a woven fabric filter. The woven fabric filter may be used for a smoking article and may include a flavored sheet fiber. The flavored sheet fiber may include a fiber obtained by cutting a flavored sheet.

[0030] According to an embodiment of the present disclosure, the flavored sheet may include a cellulose-based polymer, a plasticizer, and a flavoring material. The flavored sheet, which is a film-type sheet, may retain the flavoring material within the cellulose-based polymer to enhance persistence of a flavor and/or tobacco taste spread from a smoking product. In addition, the cellulose-based polymer may provide an airflow cooling effect due to a characteristic of a phase change (crystallization) only at a temperature (high temperature) of an airflow traveling to a smoker in the smoking article, for example, in a stick. In addition, due to a high tensile strength and flexibility of the flavored sheet, the flavored sheet may be applied as a component of a fibrous filter instead of being applied to base paper.

[0031] According to an embodiment of the present disclosure, the "smoking article" may refer to any product that may be smoked or any product that may provide a smoking experience, regardless of whether the product is based on tobacco, tobacco derivatives, expanded tobacco, reconstituted tobacco, or tobacco substitutes. For example, the smoking article may refer to an article that may be smoked to generate an aerosol, such as a cigarette, a cigar, a cigarillo, an electronic cigarette (e.g., a heating-type cigarette), and the like. The smoking article may include an aerosol generating material, or an aerosol forming substrate. In addition, the smoking article may include a solid material based on raw tobacco materials, such as reconstituted tobacco sheets, cut tobacco leaves, reconstituted tobacco, and the like. Alternatively, a smoking material may include a volatile compound.

[0032] According to an embodiment of the present disclosure, the cellulose-based polymer may be a binder material while providing a polymer matrix for forming a sheet that is flexible, that has a high tensile strength and that is capable of retaining a flavoring material. In addition, for example, the cellulose-based polymer may be used together with ethyl alcohol and a solvent (e.g., wa-

ter) used to dissolve and/or disperse ingredients for forming a film and/or a sheet. The cellulose-based polymer may include, for example, at least one selected from a group consisting of methyl cellulose, ethyl cellulose, carboxymethyl cellulose, carboxyethyl cellulose, hydroxymethyl cellulose, hydroxyethyl cellulose, hydroxypropyl cellulose, hydroxypropylmethyl cellulose, hydroxyethylmethyl cellulose, and agar, but is not limited thereto. Desirably, the cellulose-based polymer may be methyl cellulose and hydroxypropylmethyl cellulose.

[0033] According to an embodiment of the present disclosure, the cellulose-based polymer may be in an amount of 20% by weight (wt%) to 60 wt%; 20 wt% to 50 wt%; or 30 wt% to 40 wt% in the flavored sheet. If the amount of the cellulose-based polymer is less than 20 wt%, it may be difficult to obtain a tensile strength and flexibility that allow the cellulose-based polymer to be applied as a component of a woven fabric filter, or difficult to generate a sheet itself. If the amount of the cellulose-based polymer exceeds 60 wt%, it may be difficult to enhance persistence of a smoking taste and a tobacco taste because an aroma and flavor are not sufficiently expressed from a flavoring material in a sheet according to a change (e.g., breaking, and cracking) in physical properties of the sheet.

[0034] According to an embodiment of the present disclosure, as the flavoring material, all materials capable of imparting flavor and/or aroma characteristics or enhancing an aromatic taste of smoking and applicable to a smoking article may be used without limitation. The flavoring material may include, for example, at least one selected from a group consisting of an organic acid, such as a lactic acid, a citric acid, a malic acid, and the like, licorice, sucrose, fructose syrup, isosweet, cocoa, lavender, cinnamon, cardamom, celery, fenugreek, cascarrilla, white sandalwood, bergamot, geranium, honey essence, rose oil, vanilla, lemon oil, orange oil, mint oil, cinnamon, caraway, cognac, jasmine, chamomile, menthol, cassia, ylang-ylang, salvia, spearmint, ginger, cilantro, a clove extract (or a clove material), and coffee, but is not limited thereto.

[0035] According to an embodiment of the present disclosure, the flavoring material may be in an amount of 10 wt% to 50 wt%; 10 wt% to 40 wt%; 10 wt% to 30wt%; or 10 wt% to 20 wt% in the flavored sheet. If the amount of the flavoring material is within the above range, persistence of a flavor and/or tobacco taste that spread may be provided, and the flavoring material may be applied at a high concentration, to adjust an intensity of an aroma and/or flavor.

[0036] According to an embodiment of the present disclosure, the plasticizer may include at least one selected from a group consisting of propylene glycol, polyethylene glycol, dipropylene glycol, diethylene glycol, triethylene glycol, tetraethylene glycol, glycerin, and sorbitol, but not limited thereto. Desirably, the plasticizer may be propylene glycol and glycerin.

[0037] According to an embodiment of the present dis-

closure, the plasticizer may be in an amount of 1 wt% to 20 wt%; 1 wt% to 15 wt%; 1 wt% to 10 wt%; or 5 wt% to 10 wt% in the flavored sheet to adjust a strength of the flavored sheet. If the amount of the plasticizer is less than 1 wt%, it may be difficult to have a tensile strength suitable to apply the plasticizer as a component of a woven fabric filter. If the amount of the plasticizer exceeds 20 wt%, a sheet may be easily torn due to poor physical properties of the sheet (e.g., a tensile strength may be reduced, or the sheet may be excessively softened), and it may be difficult to utilize or manufacture the sheet as a flavored sheet fiber of a woven fabric filter.

[0038] According to an embodiment of the present disclosure, the flavored sheet may have a thickness of 1 millimeter (mm) or less; 0.1 mm to 1 mm; or 0.5 mm to 0.8 mm. The flavored sheet may be cut to form flavored sheet fibers. If the thickness of the flavored sheet exceeds 1 mm, it may be difficult to manufacture a sheet as a woven fabric filter because a flexibility of the sheet is not properly implemented. Due to an increase in the thickness, a flavor and aroma may not be sufficiently expressed. If the flavored sheet is extremely thin, it may be difficult to obtain the cooling effect.

[0039] According to an embodiment of the present disclosure, the flavored sheet may have a tensile strength that allows the flavored sheet to be applied as a component of the woven fabric filter of the smoking article. For example, the tensile strength of the flavored sheet may be 1.0 kilogram-force (kgf)/15 mm or greater; 2.0 kgf/15 mm or greater; 5.0 kgf/15 mm or greater; or in a range of 1.0 kgf/15 mm to 10 kgf/15 mm. If the tensile strength is within the above range, a flavored sheet with a properly balanced strength and flexibility to be applicable as a flavored sheet fiber of the woven fabric filter of the smoking article may be obtained.

[0040] According to an embodiment of the present disclosure, an average diameter (i.e., a thickness) of the flavored sheet fiber may be 1 mm or less; in a range of 0.1 mm to 1 mm; or in a range of 0.5 mm to 0.8 mm. If the average diameter of the flavored sheet fiber exceeds 1 mm, it may be difficult to manufacture a sheet as a woven fabric filter because a flexibility of the sheet is not properly implemented. Due to an increase in the thickness, a flavor and aroma may not be sufficiently expressed. If the flavored sheet fiber is extremely thin, it may be difficult to obtain the cooling effect.

[0041] According to an embodiment of the present disclosure, a shape, a thickness, a length, and the like of the woven fabric filter may be changed according to a smoking article, unless deviating from the aspect of the present disclosure. For example, if the woven fabric filter is applied to a stick of a cigarette or electronic cigarette, the woven fabric filter may have a diameter of 4.5 mm to 8 mm; a circumference of 14 mm to 25 mm; and a length of 5 mm to 20 mm.

[0042] The present disclosure relates to a smoking article including a woven fabric filter according to the present disclosure.

[0043] According to an embodiment of the present disclosure, the smoking article may include a filter portion and a smoking material portion, and may provide a cooling effect and a flavor expression effect by introducing a woven fabric filter to which a flavored sheet fiber according to the present disclosure is applied. The filter portion may include the woven fabric filter. For example, the filter portion may be a mono filter, a dual filter, or a triple filter. In addition, the filter portion may include a filter with at least one of a porous matrix structure, a tube structure, and a paper tube structure.

[0044] According to an embodiment of the present disclosure, the dual filter may include a first filter, and a second filter including a woven fabric filter according to the present disclosure. According to an embodiment of the present disclosure, the triple filter may include a first filter, a second filter including a woven fabric filter according to the present disclosure, and a third filter including a tube filter or a paper tube filter; or a first filter, a second filter including a tube filter or a paper tube filter, and a third filter including a woven fabric filter according to the present disclosure. For example, in a heating-type tobacco stick, the first filter may be positioned in a direction (a downstream direction) approaching a smoker, and the second filter and the third filter may be sequentially positioned in a direction (an upstream direction) away from the smoker.

[0045] According to an embodiment of the present disclosure, the woven fabric filter may include a flavored sheet fiber, and the flavored sheet fiber may include a fiber obtained by cutting a flavored sheet. According to an embodiment of the present disclosure, the flavored sheet may include a cellulose-based polymer, a plasticizer, and a flavoring material. The flavored sheet, which is a film-type sheet, may retain the flavoring material within the cellulose-based polymer to enhance persistence of a flavor and/or tobacco taste spread from a smoking product. In addition, the cellulose-based polymer may provide an airflow cooling effect due to a characteristic of a phase change (crystallization) only at a temperature (high temperature) of an airflow traveling to a smoker in the smoking article, for example, in a stick. In addition, due to a high tensile strength and flexibility of the flavored sheet, the flavored sheet may be applied as a component of a fibrous filter instead of being applied to base paper.

[0046] According to an embodiment of the present disclosure, the cellulose-based polymer may be a binder material while providing a polymer matrix for forming a sheet that is flexible, that has a high tensile strength and that is capable of retaining a flavoring material, and may include, for example, at least one selected from a group consisting of methyl cellulose, ethyl cellulose, carboxymethyl cellulose, carboxyethyl cellulose, hydroxymethyl cellulose, hydroxyethyl cellulose, hydroxypropyl cellulose, hydroxypropylmethyl cellulose, hydroxyethylmethyl cellulose, and agar, but is not limited thereto. Desirably, the cellulose-based polymer may be methyl cellulose and hydroxypropylmethyl cellulose.

[0047] According to an embodiment of the present disclosure, the cellulose-based polymer may be in an amount of 20% by weight (wt%) to 60 wt%; 20 wt% to 50 wt%; or 30 wt% to 40 wt% in the flavored sheet. If the amount of the cellulose-based polymer is less than 20 wt%, it may be difficult to obtain a tensile strength and flexibility that allow the cellulose-based polymer to be applied as a component of a woven fabric filter, or difficult to generate a sheet itself. If the amount of the cellulose-based polymer exceeds 60 wt%, it may be difficult to enhance persistence of a smoking taste and a tobacco taste because an aroma and flavor are not sufficiently expressed from a flavoring material in a sheet according to a change (e.g., breaking, and cracking) in physical properties of the sheet.

[0048] According to an embodiment of the present disclosure, as the flavoring material, all materials capable of imparting flavor and/or aroma characteristics or enhancing an aromatic taste of smoking and applicable to a smoking article may be used without a limitation. The flavoring material may include, for example, at least one selected from a group consisting of an organic acid, such as a lactic acid, a citric acid, a malic acid, and the like, licorice, sucrose, fructose syrup, isosweet, cocoa, lavender, cinnamon, cardamom, celery, fenugreek, cascarilla, white sandalwood, bergamot, geranium, honey essence, rose oil, vanilla, lemon oil, orange oil, mint oil, cinnamon, caraway, cognac, jasmine, chamomile, menthol, cassia, ylang-ylang, salvia, spearmint, ginger, cilantro, a clove extract (or a clove material), and coffee, but is not limited thereto.

[0049] According to an embodiment of the present disclosure, the flavoring material may be in an amount of 10 wt% to 50 wt%; 10 wt% to 40 wt%; 10 wt% to 30wt%; or 10 wt% to 20 wt% in the flavored sheet. If the amount of the flavoring material is within the above range, persistence of a flavor and/or tobacco taste that spread may be provided, and the flavoring material may be applied at a high concentration, to adjust an intensity of an aroma and/or flavor.

[0050] According to an embodiment of the present disclosure, the plasticizer may include at least one selected from a group consisting of propylene glycol, polyethylene glycol, dipropylene glycol, diethylene glycol, triethylene glycol, tetraethylene glycol, glycerin, and sorbitol, but not limited thereto. Desirably, the plasticizer may be propylene glycol and glycerin.

[0051] According to an embodiment of the present disclosure, the plasticizer may be in an amount of 1 wt% to 20 wt%; 1 wt% to 15 wt%; 1 wt% to 10 wt%; or 5 wt% to 10 wt% in the flavored sheet to adjust a strength of the flavored sheet. If the amount of the plasticizer is less than 1 wt%, it may be difficult to have a tensile strength suitable to apply the plasticizer as a component of a woven fabric filter. If the amount of the plasticizer exceeds 20 wt%, a sheet may be easily torn due to poor physical properties of the sheet (e.g., a tensile strength may be reduced, or the sheet may be excessively softened), and it may be

difficult to utilize or manufacture the sheet as a flavored sheet fiber of a woven fabric filter.

[0052] According to an embodiment of the present disclosure, the flavored sheet may have a thickness of 1 mm or less; 0.1 mm to 1 mm; or 0.5 mm to 0.8 mm. The flavored sheet may be cut to form flavored sheet fibers. If the thickness of the flavored sheet exceeds 1 mm, it may be difficult to manufacture a sheet as a woven fabric filter because a flexibility of the sheet is not properly implemented. Due to an increase in the thickness, a flavor and aroma may not be sufficiently expressed. If the flavored sheet is extremely thin, it may be difficult to obtain the cooling effect.

[0053] According to an embodiment of the present disclosure, the flavored sheet may have a tensile strength that allows the flavored sheet to be applied as a component of the woven fabric filter of the smoking article. For example, the tensile strength of the flavored sheet may be 1.0 kilogram-force (kgf)/15 mm or greater; 2.0 kgf/15 mm or greater; 5.0 kgf/15 mm or greater; or in a range of 1.0 kgf/15 mm to 10 kgf/15 mm. If the tensile strength is within the above range, a flavored sheet with a properly balanced strength and flexibility to be applicable as a flavored sheet fiber of the woven fabric filter of the smoking article may be obtained.

[0054] According to an embodiment of the present disclosure, an average diameter (i.e., a thickness) of the flavored sheet fiber may be 1 mm or less; in a range of 0.1 mm to 1 mm; or in a range of 0.5 mm to 0.8 mm. If the average diameter of the flavored sheet fiber exceeds 1 mm, it may be difficult to manufacture a sheet as a woven fabric filter because a flexibility of the sheet is not properly implemented. Due to an increase in the thickness, a flavor and aroma may not be sufficiently expressed. If the flavored sheet fiber is extremely thin, it may be difficult to obtain the cooling effect.

[0055] According to an embodiment of the present disclosure, a woven fabric filter may be manufactured by a well-known weaving or manufacturing method so that the flavored sheet fiber may be applicable as a woven fabric filter of a smoking article, which is not described in detail herein.

[0056] According to an embodiment of the present disclosure, the first filter may include a filter tow known in the art to which the present disclosure belongs, and may include a filter tow including a fibrous form, a filamentous form, or both, but is not limited thereto. The fibrous form and the filamentous form may each include at least one of a polymer, paper, cellulose acetate, activated carbon, and carbon. In addition, the tube filter may include a polymer material such as a polylactic acid (PLA), cellulose acetate (CA), poly(ethylene terephthalate) (PET), and the like, however, embodiments are not limited thereto.

[0057] According to an embodiment of the present disclosure, the smoking material portion may include raw tobacco materials, such as cut tobacco leaves, and the like, a smoking taste and aerosol forming substrate, and the like, and may be formed according to the type of

smoking articles, which is not described in detail herein.

[0058] According to an embodiment of the present disclosure, the smoking article may have a diameter of 4 mm to 10 mm and a circumference of 14 mm to 29 mm. Also, the smoking article may have a length of 45 mm to 100 mm.

[0059] According to an embodiment of the present disclosure, referring to FIGS. 1 through 3, the smoking article may be a cigarette or an electronic cigarette, and may be in the form of a cigarette. Thus, by introducing the flavored sheet, an airflow cooling effect may be obtained and an aroma and/or flavor may be expressed to enhance the persistence of the smoking taste and the tobacco taste.

[0060] According to an embodiment of the present disclosure, referring to FIG. 1, the smoking article may be a dual filter and may include a first filter portion 110, a second filter portion 120 including a woven fabric filter according to the present disclosure, and a smoking material portion 130. The smoking article may express a flavor and/or aroma using a flavored sheet while cooling an airflow traveling from the smoking material portion 130 in an airflow direction.

[0061] According to an embodiment of the present disclosure, the first filter portion 110 and the second filter portion 120 may each have a length selected from a range of 5 mm to 20 mm; or a range of 10 mm to 15 mm.

[0062] According to an embodiment of the present disclosure, the smoking material portion 130 may have a length of 15 mm to 75 mm.

[0063] According to an embodiment of the present disclosure, referring to FIG. 2, the smoking article may be a triple filter and may include a first filter portion 210, a second filter portion 220 including a tube filter or a paper tube filter; and a third filter portion 230 including the woven fabric filter.

[0064] According to an embodiment of the present disclosure, the first filter portion 210, the second filter portion 220, the third filter portion 230 and a smoking material portion 240 may each have a length selected from a range of 5 mm to 20 mm; or a range of 10 mm to 15 mm, and the third filter portion 230 may have a shortest length.

[0065] According to an embodiment of the present disclosure, referring to FIG. 3, the smoking article may be a triple filter and includes a first filter portion 310, a second filter portion 320 including the woven fabric filter; and a third filter portion 330 including a tube filter or a paper tube filter.

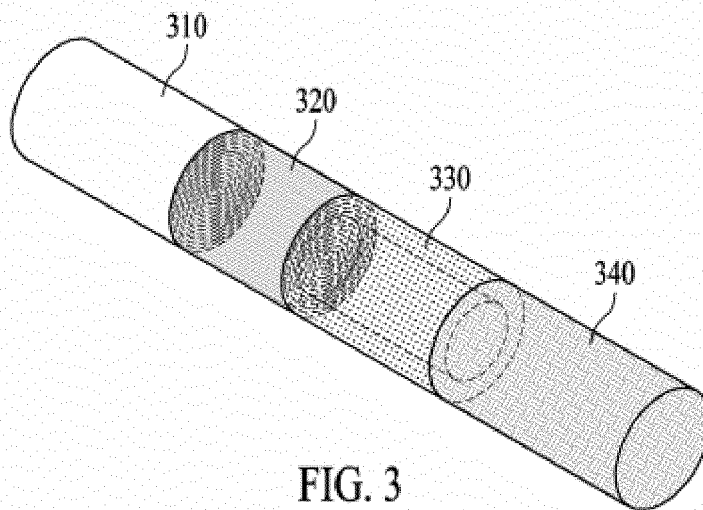
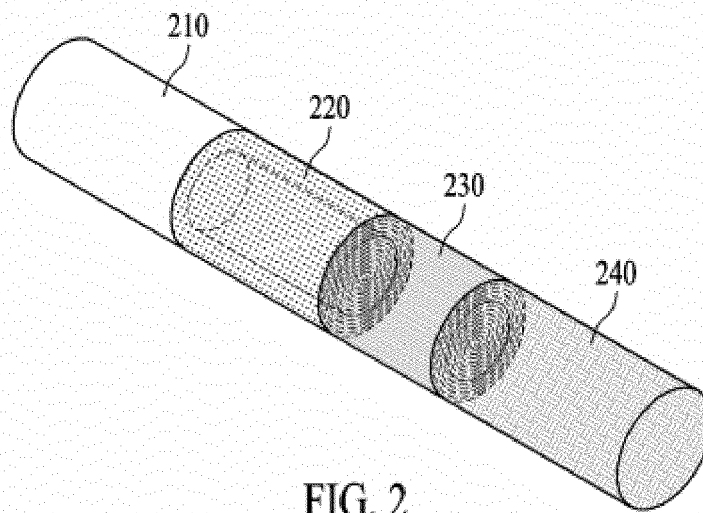
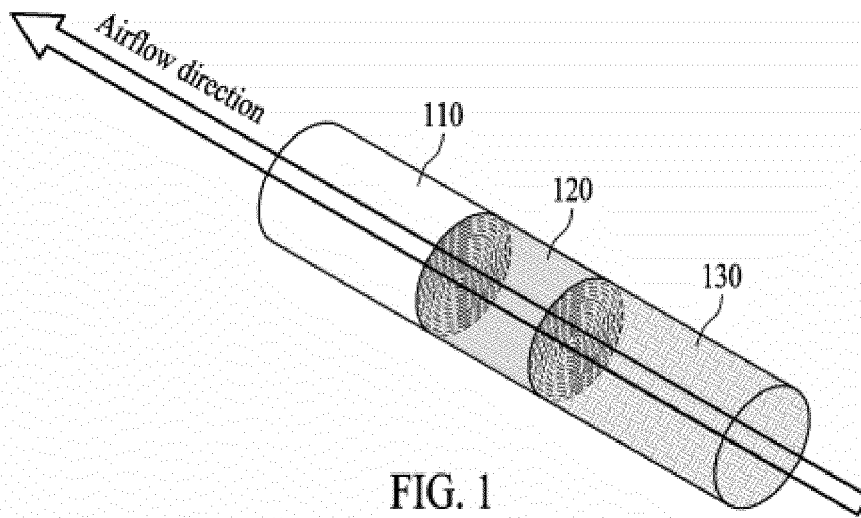
[0066] According to an embodiment of the present disclosure, the first filter portion 310, the second filter portion 320, the third filter portion 330, and a smoking material portion 340 may each have a length selected from a range of 10 mm to 20 mm; or a range of 10 mm to 15 mm, and the second filter portion 320 may have a shortest length.

[0067] While the embodiments are described with reference to drawings, it will be apparent to one of ordinary skill in the art that various alterations and modifications

in form and details may be made in these embodiments without departing from the spirit and scope of the claims and their equivalents. For example, suitable results may be achieved if the described techniques are performed in a different order, and/or if described components are combined in a different manner, and/or replaced or supplemented by other components or their equivalents. Therefore, other implementations, other embodiments, and equivalents to the claims are also within the scope of the following claims.

Claims

1. A woven fabric filter comprising:
 - a flavored sheet fiber, wherein the flavored sheet fiber is a fiber obtained by cutting a flavored sheet, and the flavored sheet comprises a cellulose-based polymer, a plasticizer, and a flavoring material.
2. The woven fabric filter of claim 1, wherein the cellulose-based polymer is in an amount of 20% by weight (wt%) to 60 wt% in the flavored sheet, and the cellulose comprises at least one selected from a group consisting of methyl cellulose, ethyl cellulose, carboxymethyl cellulose, carboxyethyl cellulose, hydroxymethyl cellulose, hydroxyethyl cellulose, hydroxypropyl cellulose, hydroxypropylmethyl cellulose, hydroxyethylmethyl cellulose, and agar.
3. The woven fabric filter of claim 1, wherein the plasticizer is in an amount of 1 wt% to 20 wt% in the flavored sheet, and the plasticizer comprises at least one selected from a group consisting of propylene glycol, polyethylene glycol, dipropylene glycol, diethylene glycol, triethylene glycol, tetraethylene glycol, glycerin, and sorbitol.
4. The woven fabric filter of claim 1, wherein the flavoring material is in an amount of 10 wt% to 50 wt% in the flavored sheet.
5. The woven fabric filter of claim 1, wherein the flavored sheet has a thickness of 1 millimeter (mm) or less.
6. The woven fabric filter of claim 1, wherein the flavored sheet has a tensile strength of 1.0 kilogram-force (kgf)/15 mm or greater.
7. The woven fabric filter of claim 1, wherein the fiber has a diameter of 1 mm or less.
8. A smoking article comprising: a filter portion comprising the woven fabric filter of claim 1.
9. The smoking article of claim 8, wherein the woven fabric filter has a circumference of 14 mm to 25 mm and a length of 5 mm to 20 mm.
10. The smoking article of claim 8, wherein the smoking article is a cigarette or an electronic cigarette and is in a form of a cigarette.
11. The smoking article of claim 8, wherein the filter portion comprises:
 - a first filter; and
 - a second filter comprising the woven fabric filter.
12. The smoking article of claim 8, wherein the filter portion comprises:
 - a first filter, a second filter comprising the woven fabric filter, and a third filter comprising a tube filter or a paper tube filter; or
 - a first filter, a second filter comprising a tube filter or a paper tube filter, and a third filter comprising the woven fabric filter.
13. The smoking article of claim 11 or 12, wherein the first filter comprises a fibrous form, a filamentous form, or both, wherein the fibrous form and the filamentous form each comprise at least one of a polymer, paper, cellulose acetate, activated carbon, and carbon.



INTERNATIONAL SEARCH REPORT

International application No.
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A. CLASSIFICATION OF SUBJECT MATTER
A24D 3/06(2006.01)i; **A24D 3/10**(2006.01)i; **A24D 3/04**(2006.01)i; **A24D 3/02**(2006.01)i; **A24B 15/32**(2006.01)i;
A24D 1/04(2006.01)i; **A24D 1/20**(2020.01)i; **A24F 40/20**(2020.01)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 3/06(2006.01); A24B 13/00(2006.01); A24B 15/24(2006.01); A24C 5/18(2006.01); A24C 5/24(2006.01);
 A24D 1/00(2006.01); A24D 3/04(2006.01); A24F 47/00(2006.01); A61M 11/04(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: 가향(flavor), 시트(sheet), 셀룰로오스(cellulose), 가소제(plasticizer), 필터(filter), 흡연(smoking)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|--|---------------------------|
| X A | KR 10-2330297 B1 (KT & G CORPORATION) 24 November 2021 (2021-11-24) See paragraphs [0025], [0045]-[0056] and [0064]-[0070]. | 1,4-5,7-11,13 2-3,6,12 |
| A | KR 10-2012-0030153 A (JAPAN TOBACCO INC.) 27 March 2012 (2012-03-27) See paragraphs [0020]-[0041]; and figures 1-2. | 1-13 |
| A | KR 10-2017-0083101 A (BRITISH AMERICAN TOBACCO (INVESTMENTS) LIMITED) 17 July 2017 (2017-07-17) See paragraphs [0067]-[0075]; and figure 6. | 1-13 |
| A | KR 10-2021-0076509 A (KT & G CORPORATION) 24 June 2021 (2021-06-24) See paragraphs [0053]-[0058]; and figures 2-4. | 1-13 |

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
 "D" document cited by the applicant in the international application
 "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

Date of the actual completion of the international search: **27 February 2023**
 Date of mailing of the international search report: **27 February 2023**

Name and mailing address of the ISA/KR: **Korean Intellectual Property Office, Government Complex-Daejeon Building 4, 189 Cheongsaro, Seo-gu, Daejeon 35208**
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 Authorized officer:
 Telephone No.:

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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. |
| A | KR 10-2018-0120713 A (NERUDIA LTD) 06 November 2018 (2018-11-06) See paragraphs [0108]-[0130]; and figures 4-6. | 1-13 |
| | | |

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/KR2022/018585

| Patent document cited in search report | Publication date (day/month/year) | Patent family member(s) | Publication date (day/month/year) |
|--|-----------------------------------|-------------------------|-----------------------------------|
| KR 10-2330297 | B1 24 November 2021 | None | |
| KR 10-2012-0030153 | A 27 March 2012 | CA 2768663 A1 | 03 February 2011 |
| | | CA 2768663 C | 02 September 2014 |
| | | CN 102481015 A | 30 May 2012 |
| | | CN 102481015 B | 22 July 2015 |
| | | EP 2460420 A1 | 06 June 2012 |
| | | EP 2460420 B1 | 04 July 2018 |
| | | JP 5279098 B2 | 04 September 2013 |
| | | MY 153699 A | 13 March 2015 |
| | | RU 2475168 C1 | 20 February 2013 |
| | | UA 100104 C2 | 12 November 2012 |
| | | US 2012-0279509 A1 | 08 November 2012 |
| | | US 8839801 B2 | 23 September 2014 |
| | | WO 2011-013478 A1 | 03 February 2011 |
| KR 10-2017-0083101 | A 17 July 2017 | AR 102938 A1 | 05 April 2017 |
| | | AU 2015-359125 A1 | 18 May 2017 |
| | | AU 2015-359125 B2 | 08 March 2018 |
| | | BR 112017012270 A2 | 30 January 2018 |
| | | BR 112017012270 B1 | 05 April 2022 |
| | | CA 2966446 A1 | 16 June 2016 |
| | | CA 2966446 C | 16 July 2019 |
| | | CL 2017001462 A1 | 23 February 2018 |
| | | CN 106998796 A | 01 August 2017 |
| | | EP 3229617 A1 | 18 October 2017 |
| | | EP 3229617 B1 | 05 May 2021 |
| | | ES 1193486 U | 16 October 2017 |
| | | ES 1193486 Y | 09 January 2018 |
| | | GB 201421799 D0 | 21 January 2015 |
| | | HK 1245025 A1 | 24 August 2018 |
| | | JP 2017-536850 A | 14 December 2017 |
| | | JP 6650948 B2 | 19 February 2020 |
| | | MX 2017007337 A | 11 April 2018 |
| | | MY 188157 A | 24 November 2021 |
| | | PH 12017500955 A1 | 02 October 2017 |
| | | PL 126605 U1 | 22 October 2018 |
| | | RO 201700025 U2 | 30 August 2018 |
| | | RO 201700025 U3 | 29 November 2021 |
| | | RU 2666218 C1 | 06 September 2018 |
| | | TR 201708446 U | 21 August 2017 |
| | | US 2019-0082731 A1 | 21 March 2019 |
| | | WO 2016-092284 A1 | 16 June 2016 |
| | | ZA 201703001 B | 25 November 2020 |
| KR 10-2021-0076509 | A 24 June 2021 | WO 2021-125444 A1 | 24 June 2021 |
| KR 10-2018-0120713 | A 06 November 2018 | CA 3015445 A1 | 31 August 2017 |
| | | CN 108778380 A | 09 November 2018 |
| | | CN 207100508 U | 16 March 2018 |
| | | EP 3419705 A1 | 02 January 2019 |
| | | EP 3419705 B1 | 12 February 2020 |
| | | GB 201603418 D0 | 13 April 2016 |
| | | GB 2547699 A | 30 August 2017 |

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

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/KR2022/018585

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30

35

40

45

50

55

| Patent document cited in search report | Publication date (day/month/year) | Patent family member(s) | Publication date (day/month/year) |
|--|-----------------------------------|-------------------------|-----------------------------------|
| | | GB 2547699 B | 22 September 2021 |
| | | GB 2594423 A | 27 October 2021 |
| | | GB 2594423 B | 30 March 2022 |
| | | GB 2598872 A | 16 March 2022 |
| | | GB 2598872 B | 07 September 2022 |
| | | JP 2019-511213 A | 25 April 2019 |
| | | PL 3419705 T3 | 05 October 2020 |
| | | RU 2018133599 A | 26 March 2020 |
| | | RU 2018133599 A3 | 02 April 2020 |
| | | US 2019-0046741 A1 | 14 February 2019 |
| | | WO 2017-144861 A1 | 31 August 2017 |

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