(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 4 268 621 A1**

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

(43) Date of publication:
01.11.2023 Bulletin 2023/44

(21) Application number: **21910411.4**

(22) Date of filing: **13.12.2021**

(51) International Patent Classification (IPC):
A24B 15/16 *(2020.01)* ***A24D 1/20*** *(2020.01)*
A24F 40/20 *(2020.01)*

(52) Cooperative Patent Classification (CPC):
A24B 15/16; A24D 1/20; A24F 40/20

(86) International application number:
PCT/JP2021/045738

(87) International publication number:
WO 2022/138262 (30.06.2022 Gazette 2022/26)

(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 MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(30) Priority: **24.12.2020 JP 2020215381**

(71) Applicant: **Japan Tobacco Inc.**
Tokyo 105-6927 (JP)

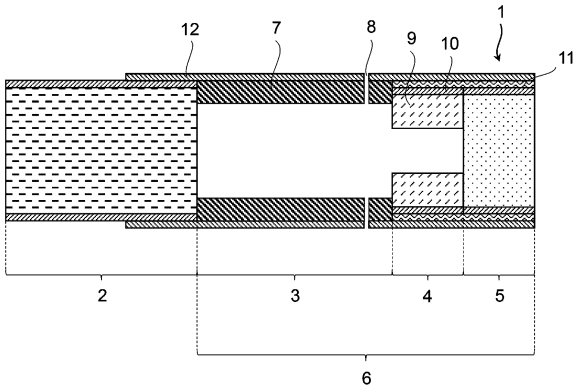
(72) Inventors:
- **UCHII, Kimitaka**
Tokyo 130-8603 (JP)
- **KOIDE, Akihiro**
Tokyo 130-8603 (JP)

(74) Representative: **Hoffmann Eitle**
Patent- und Rechtsanwälte PartmbB
Arabellastraße 30
81925 München (DE)

(54) **TOBACCO COMPOSITION, TOBACCO-CONTAINING SEGMENT, NON-COMBUSTION HEATING-TYPE FLAVOR INHALER, AND NON-COMBUSTION HEATING-TYPE FLAVOR INHALATION SYSTEM**

(57) Provided is a tobacco composition that enables a tobacco flavor to be fully expressed and aerosols to be sufficiently generated. The tobacco composition contains a first material including a tobacco component, and a second material including at least 25 mass% of an aerosol-generating agent, wherein the content of the aerosol-generating agent included in the first material is less than 25 mass%, the mass percentage of the second material with respect to the total mass of the first material and the second material is at least 15 mass%, and the first material comprises leaf tobacco or a tobacco sheet and leaf tobacco, and the mass ratio of the tobacco sheet and the leaf tobacco (tobacco sheet : leaf tobacco) is 0-70: 30-100.

Fig. 1



EP 4 268 621 A1

Description

TECHNICAL FIELD

[0001] The present invention relates to a tobacco composition, a tobacco-containing segment, a non-combustion heating-type flavor inhaler, and a non-combustion heating-type flavor inhalation system.

BACKGROUND ART

[0002] In a combustion-type flavor inhaler (cigarette), a tobacco-containing segment with a tobacco filler containing leaf tobacco is burned to taste a flavor. As an alternative to the combustion-type flavor inhaler, a non-combustion heating-type flavor inhaler has been proposed in which a tobacco-containing segment is not burned but heated to taste a flavor. The heating temperature of a non-combustion heating-type flavor inhaler is lower than the combustion temperature of a combustion-type flavor inhaler and is approximately 400°C or less, for example. Because the heating temperature of a non-combustion heating-type flavor inhaler is low, as described above, an aerosol generator, such as glycerin, is added to a tobacco filler in the non-combustion heating-type flavor inhaler to increase the amount of smoke. An aerosol generator is vaporized by heating and generates an aerosol. A user is supplied with the aerosol together with a tobacco component and can taste sufficient flavor.

[0003] In a tobacco-containing segment of a non-combustion heating-type flavor inhaler, a tobacco filler filled with a tobacco sheet instead of leaf tobacco is typically used as a tobacco filler so that the tobacco filler can contain a sufficient amount of aerosol generator (for example, Patent Literature 1). The tobacco sheet is manufactured by forming a composition containing tobacco into a sheet shape and contains fiber, such as pulp, as a filler for the forming. Because the fiber can absorb an aerosol generator, the tobacco sheet can hold a larger amount of aerosol generator than leaf tobacco.

[0004] On the other hand, Patent Literature 2 to Patent Literature 6 disclose a tobacco composition containing leaf tobacco and a tobacco sheet, mainly for use in a combustion-type flavor inhaler.

CITATION LIST

PATENT LITERATURE

[0005]

PTL 1: Japanese Unexamined Patent Application Publication (Translation of PCT Application) No. 2014-515274
PTL 2: Japanese Unexamined Patent Application Publication (Translation of PCT Application) No. 2019-503659
PTL 3: Japanese Unexamined Patent Application Publication (Translation of PCT Application) No. 2013-502232
PTL 4: Japanese Unexamined Patent Application Publication No. 7-184624
PTL 5: Japanese Unexamined Patent Application Publication (Translation of PCT Application) No. 2018-516075
PTL 6: International Publication No. WO 2011/013478

SUMMARY OF INVENTION

TECHNICAL PROBLEM

[0006] As described above, a tobacco filler in a tobacco-containing segment of a non-combustion heating-type flavor inhaler is typically composed only of a tobacco sheet containing both a tobacco component and an aerosol generator. To develop a tobacco flavor, the amount of heat should be controlled to reach a temperature into which the saturated vapor pressure of a flavor component is considered. On the other hand, to generate an aerosol, the amount of heat should be controlled to reach an evaporation temperature into which the specific heat (heat capacity) of an aerosol generator is considered. It is thought that the amount of heat and temperature required for the phenomena of developing a tobacco flavor and generating an aerosol are different. Thus, for a material containing both a tobacco component and an aerosol generator, it is difficult to improve both phenomena at the same time.

[0007] It is an object of the present invention to provide a tobacco composition that sufficiently develops a tobacco flavor and can sufficiently generate an aerosol, a tobacco-containing segment containing the tobacco composition, a non-combustion heating-type flavor inhaler, and a non-combustion heating-type flavor inhalation system.

SOLUTION TO PROBLEM

[0008] The present invention includes the following aspects.

[0009] A tobacco composition according to an embodiment of the present invention includes

a first material containing a tobacco component, and
a second material containing 25% by mass or more of an aerosol generator,
wherein the first material has an aerosol generator content of less than 25% by mass,
a ratio of a mass of the second material to a total mass of the first material and the second material is 15% by mass or more,
the first material is composed of leaf tobacco or is composed of a tobacco sheet and leaf tobacco, and
a mass ratio of the tobacco sheet to the leaf tobacco is tobacco sheet: leaf tobacco = 0 to 70:30 to 100.

[0010] A tobacco-containing segment according to an embodiment of the present invention includes a tubular wrapper and a tobacco filler, wherein the tobacco filler contains a tobacco composition according to an embodiment of the present invention filled in the wrapper.

[0011] A non-combustion heating-type flavor inhaler according to an embodiment of the present invention includes a tobacco-containing segment according to an embodiment of the present invention.

[0012] A non-combustion heating-type flavor inhalation system according to an embodiment of the present invention includes

a non-combustion heating-type flavor inhaler according to an embodiment of the present invention and
a heating device for heating the tobacco-containing segment.

ADVANTAGEOUS EFFECTS OF INVENTION

[0013] The present invention can provide a tobacco composition that sufficiently develops a tobacco flavor and can sufficiently generate an aerosol, a tobacco-containing segment containing the tobacco composition, a non-combustion heating-type flavor inhaler, and a non-combustion heating-type flavor inhalation system.

BRIEF DESCRIPTION OF DRAWINGS

[0014]

Fig. 1 is a cross-sectional view of an example of a non-combustion heating-type flavor inhaler according to the present embodiment.
Fig. 2 is a cross-sectional view of an example of a non-combustion heating-type flavor inhalation system according to the present embodiment, illustrating (a) a state before a non-combustion heating-type flavor inhaler is inserted into a heating device and (b) a state in which the non-combustion heating-type flavor inhaler is inserted into the heating device and is heated.

DESCRIPTION OF EMBODIMENTS

[Tobacco Composition]

[0015] A tobacco composition according to the present embodiment contains a first material containing a tobacco component and a second material containing 25% by mass or more of an aerosol generator. The first material has an aerosol generator content of less than 25% by mass. The ratio of the mass of the second material to the total mass of the first material and the second material (hereinafter also referred to as "the mass ratio of the second material") is 15% by mass or more. The tobacco composition according to the present embodiment may be composed of the first material and the second material. The first material is composed of leaf tobacco or is composed of a tobacco sheet and leaf tobacco, and the mass ratio of the tobacco sheet to the leaf tobacco is tobacco sheet:leaf tobacco = 0 to 70:30 to 100.

[0016] The present inventors have found that the use of a blend of two materials specific to the phenomena of developing a tobacco flavor and generating an aerosol allows each material to use only the required amount of heat for heating and can cause both phenomena at the same time. More specifically, the first material containing the tobacco component and having an aerosol generator content of less than 25% by mass is a material specific to developing a tobacco flavor and, due to its low specific heat (heat capacity), can easily reach the evaporation temperature of a flavor component by heating. On the other hand, the second material containing 25% by mass or more of the aerosol generator is a material specific to generating an aerosol and, in spite of its high specific heat (heat capacity), can vaporize the aerosol generator by heating without preventing vaporization of a flavor component of the first material. Thus, the tobacco composition according to the present embodiment containing the first material and the second material can sufficiently generate an

aerosol while sufficiently developing a tobacco flavor by heating. When the mass ratio of the second material is 15% by mass or more, a sufficient amount of aerosol can be generated. The tobacco composition according to the present embodiment is particularly useful as a tobacco composition for a non-combustion heating-type flavor inhaler.

[0017] The tobacco composition according to the present embodiment preferably has an aerosol generator content in the range of 10% to 40% by mass. When the content is 10% by mass or more, the aerosol can be further generated. When the content is 40% by mass or less, the tobacco flavor can be further developed. The content more preferably ranges from 10% to 30% by mass, still more preferably 10% to 20% by mass. Examples of the aerosol generator include glycerin, propylene glycol, and 1,3-butanediol. These aerosol generators may be used alone or in combination.

[First Material]

[0018] The first material contains a tobacco component. The tobacco component may be nicotine, cembratrienediol (CBT), 3-oxoionol, or megastigmatrienone. These components are volatile flavor components and contribute to developing a tobacco flavor. The first material may contain one or two or more of these tobacco components. Regarding the tobacco component content of the first material, when containing CBT as a tobacco component, the first material preferably has a CBT content of 0.01% by mass or more. When the content is 0.01% by mass or more, the tobacco flavor is further developed. The content more preferably ranges from 0.01% to 0.80% by mass, still more preferably 0.01% to 0.50% by mass. The CBT content of the first material is measured by the following method. 5 g of the first material is weighed in a 100-ml screw tube, and 50 ml of ethyl acetate is added to the sample. After mixed well, the sample is allowed to stand at normal temperature for a whole day and night. The liquid mixture is filtered through a filter paper, and a small amount of anhydrous sodium sulfate is added to the filtrate (extract) for dehydration. The filtrate is again filtered through a filter paper. After dehydration, ethyl acetate in the liquid is removed under vacuum. The resulting dried product is dissolved in ethyl acetate and is subjected to GC/MS analysis.

[0019] The first material may contain an aerosol generator and has an aerosol generator content of less than 25% by mass. When the content is less than 25% by mass, the vaporization of a flavor component is not prevented, and a tobacco flavor is developed. The content is preferably 22% by mass or less, more preferably 15% by mass or less, still more preferably 10% by mass or less, still more preferably 5% by mass or less, still more preferably 3% by mass or less, still more preferably 1% by mass or less, particularly preferably 0% by mass, that is, the first material particularly preferably contains no aerosol generator.

[0020] The first material is composed of leaf tobacco or is composed of a tobacco sheet and leaf tobacco. In other words, the first material may be composed only of leaf tobacco or may be composed of a tobacco sheet and leaf tobacco. The mass ratio of the tobacco sheet to the leaf tobacco is tobacco sheet:leaf tobacco = 0 to 70:30 to 100. When the mass ratio of the tobacco sheet is 70% by mass or less (the mass ratio of the leaf tobacco is 30% by mass or more), the tobacco flavor is developed more strongly. The mass ratio preferably ranges from 0 to 50:50 to 100, more preferably 0 to 30:70 to 100. For leaf tobacco containing a component, such as an aerosol generator, the mass of the leaf tobacco includes the mass of the component.

[0021] The tobacco sheet may contain a tobacco component and a reinforcing material. The reinforcing material may be, for example, fiber, such as pulp, or a binder. The tobacco sheet may contain an aerosol generator and preferably has an aerosol generator content of 15% by mass or less. When the content is 15% by mass or less, the vaporization of a flavor component is not prevented, and the tobacco flavor is further developed. The content is more preferably 10% by mass or less, still more preferably 5% by mass or less, particularly preferably 3% by mass or less.

[0022] The leaf tobacco may contain an aerosol generator and preferably has an aerosol generator content of 10% by mass or less. When the content is 10% by mass or less, the vaporization of a flavor component is not prevented, and the tobacco flavor is further developed. The content is more preferably 5% by mass or less, still more preferably 3% by mass or less. The aerosol generator content of the first material (tobacco sheet, leaf tobacco), the second material, and the tobacco composition is measured by the following method. 0.2 g of a measurement sample is weighed in a 30-ml screw tube, and 20 ml of isopropanol is added to the measurement sample. The measurement sample is mixed by shaking at normal temperature for a whole day and night. The liquid mixture is filtered through a filter paper to prepare a filtrate. The solution is subjected to GC analysis.

[0023] (Structure of Leaf Tobacco)

<Definition>

[0024] The term "leaf tobacco", as used herein, includes a harvested tobacco leaf, a lamina, a midrib, and the like produced by stripping and separation of a harvested tobacco leaf, an aged leaf tobacco after aging (including curing), and a shredded tobacco produced by shredding an aged leaf tobacco or the like to a predetermined size. In addition, undried leaves immediately after harvesting, tobacco stems, tobacco roots, and the like may also be added as raw materials and can be suitably used.

<Varieties of Tobacco>

[0025] Different varieties of tobacco can be used. Representative examples thereof include flue-cured varieties, burley varieties, oriental varieties, native varieties, and other Nicotiana tabacum varieties and Nicotiana rustica varieties. Although these varieties of Nicotiana may be used alone, to generate a desired flavor, they can be used as a blend in the process from harvesting of leaf tobacco to shredding of aged leaf tobacco. Details of varieties of tobacco are disclosed in "Tabako no jiten (Tobacco Dictionary), Tobacco Academic Studies Center, March 31, 2009".

<Blend of Tobacco Varieties>

[0026] As described above, tobacco varieties can be blended in the process from harvesting of leaf tobacco to shredding of aged leaf tobacco. The term "blend" typically refers to a mixture of the same or different varieties of tobacco, and the term "blend", as used herein, may also refer to a combination of different varieties of aged leaf tobacco or different varieties of shredded tobacco. Blending tobacco of the same variety but of different grades is sometimes specifically referred to as "cross-blend".

[0027] In each variety of tobacco, leaf tobacco is graded by characteristics, such as place of origin, place in the plant, color, surface condition, size, and shape. Furthermore, it is thought that leaf tobacco contains more than 300 chemical components, and different varieties of tobacco have different chemical characteristics. Even in the same variety of tobacco, different grades of tobacco may have different chemical characteristics. To obtain a tobacco raw material with desired characteristics and desired chemical characteristics, therefore, the blending or cross-blending is performed.

<Treatment of Leaf Tobacco>

[0028] Treatment of harvested leaf tobacco at an early stage may be, for example, curing, treatment in a raw material factory, or aging.

<Curing>

[0029] After being harvested, leaf tobacco is typically subjected to curing at an early stage. Curing is a treatment of aging leaf tobacco and typically includes drying, humidity control, and the like, and also includes activating the functions of various enzymes contained in leaf tobacco. Cured leaf tobacco is packaged in a case and is stored in a warehouse for a certain period before being transported to a raw material factory. To produce leaf tobacco with low benzo[a]pyrene and low-molecular-weight carboxylic acid contents and containing a large amount of specific flavor component, harvested leaf tobacco may be subjected to treatment described in International Publication No. WO 2018/139068 instead of the curing.

<Treatment and Aging in Raw Material Factory>

[0030] Cured leaf tobacco transported to a raw material factory is unwrapped and is then typically processed into a lamina, a midrib, and the like by humidity control, stripping, separation, and the like. The lamina, midrib, and the like are then redried and packed in a case and are stored in a warehouse for extended periods. The long-term storage in a warehouse is also sometimes referred to as aging. The period of aging depends on the variety of tobacco used, the desired flavor of the tobacco product, and the aging temperature, and is typically one year or more and two years or less. Leaf tobacco that is subjected to curing as a type of aging or to a treatment as an alternative to the curing and that is further subjected to aging is referred to as "aged leaf tobacco".

[0031] Casing and aging leaf tobacco processed into a lamina, a midrib, and the like is sometimes referred to as aging after stripping. On the other hand, casing and aging leaf tobacco transported to a raw material factory without stripping and separation, followed by stripping and separation, is sometimes referred to as stripping after aging.

<Flavoring and Taste Agent>

[0032] A flavoring and taste agent may be added to leaf tobacco. The type of flavoring and taste agent is, but not limited to, for example, a flavoring agent or a taste agent, from the perspective of imparting a good flavor. In addition, if necessary, a colorant, a wetting agent, and/or a preservative may be contained. The flavoring and taste agent and optional materials may have any properties and are, for example, liquids or solids. They may be a single component or a combination of a plurality of components.

[0033] A suitable flavor of the flavoring agent may be a flavoring agent selected from tobacco extracts and tobacco components, carbohydrates and sugar flavors, licorice (glycyrrhiza), cocoa, chocolate, fruit juices and fruits, spices,

foreign liquors, herbs, vanilla, and flower flavors, or a plant bulk powder. These may be used alone or in combination.

[0034] The flavoring agent may be one of a wide variety of flavor components, for example, described in "Shuuchi kanyou gijutsushu (kouryou) (Well-known and commonly used techniques (flavoring agent))" (March 14, 2007, issued by Japan Patent Office), "Saishin koryo no jiten (Dictionary of latest flavoring agents (popular edition)" (February 25, 2012, edited by ARAI Soichi, KOBAYASHI Akio, YASHIMA Izumi, and KAWASAKI Michiaki, Asakura Publishing Co., Ltd.), and "Tobacco Flavoring for Smoking Products" (June 1972, R.J. REYNOLDS TOBACCO COMPANY).

[0035] The flavoring agent may be, for example, selected from isothiocyanates, indoles and derivatives thereof, ethers, esters, ketones, fatty acids, aliphatic higher alcohols, aliphatic higher aldehydes, aliphatic higher hydrocarbons, thioethers, thiols, terpene hydrocarbons, phenol ethers, phenols, furfural and derivatives thereof, aromatic alcohols, aromatic aldehydes, and lactones, which may be used alone or in combination. The flavoring agent may be a material that provides a cool/warm stimulus.

[0036] More specifically, the flavoring agent may be acetoanisole, acetophenone, acetylpyrazine, 2-acetylthiazole, an alfalfa extract, amyl alcohol, amyl butyrate, trans-anethole, star anise oil, apple juice, Peru balsam oil, beeswax absolute, benzaldehyde, benzoin resinoid, benzyl alcohol, benzyl benzoate, benzyl phenylacetate, benzyl propionate, 2,3-butanedione, 2-butanol, butyl butyrate, butyric acid, caramel, cardamom oil, carob absolute, β-carotene, carrot juice, L-carvone, β-caryophyllene, cassia bark oil, cedarwood oil, celery seed oil, chamomile oil, cinnamaldehyde, cinnamic acid, cinnamyl alcohol, cinnamyl cinnamate, citronella oil, DL-citronellol, a clary sage extract, coffee, cognac oil, coriander oil, cumin aldehyde, davana oil, δ-decalactone, γ-decalactone, decanoic acid, dill herb oil, 3,4-dimethyl-1,2-cyclopentanedione, 4,5-dimethyl-3-hydroxy-2,5-dihydrofuran-2-one, 3,7-dimethyl-6-octenoic acid, 2,3-dimethylpyrazine, 2,5-dimethylpyrazine, 2,6-dimethylpyrazine, ethyl 2-methylbutyrate, ethyl acetate, ethyl butyrate, ethyl hexanoate, ethyl isovalerate, ethyl lactate, ethyl laurate, ethyl levulinate, ethyl maltol, ethyl octanoate, ethyl oleate, ethyl palmitate, ethyl phenylacetate, ethyl propionate, ethyl stearate, ethyl valerate, ethylvanillin, ethylvanillin glucoside, 2-ethyl-3,(5 or 6)-dimethyl pyrazine, 5-ethyl-3-hydroxy-4-methyl-2(5H)-furanone, 2-ethyl-3-methylpyrazine, eucalyptol, fenugreek absolute, genet absolute, gentian root infusion, geraniol, geranyl acetate, grape juice, guaiacol, a guava extract, γ-heptalactone, γ-hexalactone, hexanoic acid, cis-3-hexen-1-ol, hexyl acetate, hexyl alcohol, hexyl phenylacetate, honey, 4-hydroxy-3-pentenoic acid lactone, 4-hydroxy-4-(3-hydroxy-1-butenyl)-3,5,5-trimethyl-2-cyclohexen-1-one, 4-(p-hydroxyphenyl)-2-butanone, sodium 4-hydroxyundecanoate, immortelle absolute, β-ionone, isoamyl acetate, isoamyl butyrate, isoamyl phenylacetate, isobutyl acetate, isobutyl phenylacetate, jasmine absolute, kola nut tincture, labdanum oil, lemon terpeneless oil, a licorice extract, linalool, linalyl acetate, lovage root oil, maple syrup, menthol, menthone, L-menthyl acetate, p-methoxy benzaldehyde, methyl-2-pyrrolyl ketone, methyl anthranilate, methyl phenylacetate, methyl salicylate, 4'-methylacetophenone, methylcyclopentenolone, 3-methylvaleric acid, mimosa absolute, syrup, myristic acid, nerol, nerolidol, γ-nonalactone, nutmeg oil, δ-octalactone, octanal, octanoic acid, orange flower oil, orange oil, orris root oil, palmitic acid, ω-pentadecalactone, peppermint oil, petitgrain Paraguay oil, phenethyl alcohol, phenethyl phenylacetate, phenylacetic acid, piperonal, a plum extract, propenyl guaethol, propyl acetate, 3-propylidenephthalide, prune juice, pyruvic acid, a raisin extract, rose oil, rum, sage oil, sandalwood oil, spearmint oil, styrax absolute, marigold oil, tea distillate, α-terpineol, terpinyl acetate, 5,6,7,8-tetrahydroquinoxaline, 1,5,5,9-tetramethyl-13-oxacyclo(8.3.0.0(4.9))tridecane, 2,3,5,6-tetramethylpyrazine, thyme oil, a tomato extract, 2-tridecanone, triethyl citrate, 4-(2,6,6-trimethyl-1-cyclohexenyl)2-butene-4-one, 2,6,6-trimethyl-2-cyclohexene-1,4-dione, 4-(2,6,6-trimethyl-1,3-cyclohexadienyl)2-butene-4-one, 2,3,5-trimethylpyrazine, γ-undecalactone, γ-valerolactone, a vanilla extract, vanillin, veratraldehyde, violet leaf absolute, citral, mandarin oil, 4-(acetoxymethyl) toluene, 2-methyl-1-butanol, ethyl 10-undecenoate, isoamyl hexanoate, 1-phenylethylacetic acid, lauric acid, 8-mercaptomenthone, sinensal, hexyl butyrate, a plant powder (herb powder, flour powder, spice powder, tea powder: cocoa powder, carob powder, coriander powder, licorice powder, orange peel powder, rose hip powder, chamomile flower powder, lemon verbena powder, peppermint powder, leaf powder, spearmint powder, black tea powder, etc.), camphor, isopulegol, cineol, mint oil, eucalyptus oil, 2-l-menthoxy ethanol (COOLACT (registered trademark) 5), 3-l-menthoxy propane-1,2-diol (COOLACT (registered trademark) 10), l-menthyl-3-hydroxybutyrate (COOLACT (registered trademark) 20), p-menthane-3,8-diol (COOLACT (registered trademark) 38D), N-(2-hydroxy-2-phenylethyl)-2-isopropyl-5,5-dimethylcyclohexane-1-carboxamide (COOLACT (registered trademark) 370), N-(4-(cyanomethyl)phenyl)-2-isopropyl-5,5-dimethylcyclohexanecarboxamide (COOLACT (registered trademark) 400), N-(3-hydroxy-4-methoxyphenyl)-2-isopropyl-5,5-dimethylcyclohexanecarboxamide, N-ethyl-p-menthane-3-carboamide (WS-3), ethyl-2-(p-menthan-3-carboxamide) acetate (WS-5), N-(4-methoxyphenyl)-p-menthane carboxamide (WS-12), 2-isopropyl-N,2,3-trimethylbutyramide (WS-23), 3-l-menthoxy-2-methylpropane-1,2-diol, 2-l-menthoxy ethane-1-ol, 3-l-menthoxy propane-1-ol, 4-l-menthoxy butane-1-ol, menthyl lactate (FEMA3748), menthone glycerin acetal (Frescolat MGA, FEMA3807, FEMA3808), 2-(2-l-menthyloxyethyl) ethanol, menthyl glyoxylate, menthyl 2-pyrrolidone-5-carboxylate, menthyl succinate (FEMA3810), N-(2-(pyridin-2-yl)-ethyl)-3-p-menthane carboxamide (FEMA4549), N-(ethoxycarbonylmethyl)-p-menthane-3-carboxamide, N-(4-cyanomethylphenyl)-p-menthane carboxamide, N-(4-aminocarbonylphenyl)-p-menthane, or the like.

[0037] The taste agent may be, for example, a material with sweetness, sourness, saltiness, umami, bitterness, acerbity, kokumi, pungency, harshness, astringency, or the like. Examples of the material with sweetness include saccharides,

sugar alcohols, and sweeteners. Examples of the saccharides include monosaccharides, disaccharides, oligosaccharides, and polysaccharides. Examples of the sweeteners include natural sweeteners and synthetic sweeteners. Examples of the material with acidity include organic acids (and sodium salts thereof). Examples of the organic acids include acetic acid, adipic acid, citric acid, lactic acid, malic acid, succinic acid, and tartaric acid. Examples of the material with bitterness include caffeine (extract), naringin, and wormwood extracts. Examples of the material with saltiness include sodium chloride, potassium chloride, sodium citrate, potassium citrate, sodium acetate, and potassium acetate. Examples of the material with umami include sodium glutamate, sodium inosinate, and sodium guanylate. Examples of the material with acerbity include tannin and shibuol.

[0038] Examples of the colorant include natural dye/pigments and synthetic dye/pigments. Examples of the natural dye/pigments include caramel, turmeric, red yeast rice, gardenia, safflower, carotene, marigold, and annatto. Examples of the synthetic dye/pigments include tar dyes and titanium oxide.

[0039] Examples of the wetting agent include lipids (waxes, cera, glycerin, medium-chain fatty acid triglycerides, and fatty acids (short-chain, medium-chain, long-chain fatty acids)) polyols (glycerol, poly(ethylene glycol), 1,3-butanediol, etc.), and sugar alcohols (erythritol, sorbitol, xylitol, etc.).

[0040] Examples of the preservative include acetic acid, benzoic acid, propionic acid, citric acid, lactic acid, malic acid, sorbic acid, tartaric acid (and salts thereof), nisin, and common preservatives used in foods.

[0041] When the flavoring and taste agent is added to leaf tobacco, from the perspective of imparting a good flavor, the flavoring and taste agent content of the leaf tobacco is, but not limited to, for example, typically 10 ppm or more, preferably 10,000 ppm or more, more preferably 50,000 ppm or more, and typically 250,000 ppm or less, preferably 200,000 ppm, more preferably 150,000 ppm or less, still more preferably 100,000 ppm or less.

<Shredded Tobacco of Leaf Tobacco>

[0042] Leaf tobacco may be shredded tobacco of leaf tobacco (hereinafter also referred to as "shredded leaf tobacco"). Shredded leaf tobacco is produced by shredding aged leaf tobacco or the like into a predetermined size. Aged leaf tobacco used for shredded leaf tobacco may be, but is not limited to, one produced by stripping and separation into a lamina and a midrib.

<Method for Preparing Shredded Leaf Tobacco>

[0043] Shredded leaf tobacco may have any size and may be prepared by any method. For example, aged leaf tobacco is shredded to a width of 0.5 mm or more and 2.0 mm or less and a length of 3 mm or more and 10 mm or less. Shredded leaf tobacco with such a size is preferred for filling a wrapper described later.

(Structure of Tobacco Sheet)

[0044] The tobacco sheet is produced by forming a composition containing aged leaf tobacco and the like into a sheet shape. Aged leaf tobacco used for the tobacco sheet may be, but is not limited to, one produced, for example, by stripping and separation into a lamina and a midrib. The term "sheet", as used herein, refers to a shape with a pair of approximately parallel main surfaces and side surfaces. The tobacco sheet may contain fiber, such as pulp.

<Method for Forming Tobacco Sheet>

[0045] A tobacco sheet can be formed by a known method, such as a papermaking method, a casting method, or a rolling method. Details of various tobacco sheets formed by such a method are disclosed in "Tabako no jiten (Tobacco Dictionary), Tobacco Academic Studies Center, March 31, 2009". In the present description, a tobacco sheet formed by a papermaking method is referred to as a "papermaking tobacco sheet", a tobacco sheet formed by a casting method (slurry method) is referred to as a "slurry tobacco sheet", and a tobacco sheet formed by a rolling method is referred to as a "rolled tobacco sheet".

<Method for Forming Tobacco Sheet (Papermaking Method)>

[0046] A method for forming a tobacco sheet by a papermaking method may include the following steps, for example.

(1) The step of coarsely crushing aged leaf tobacco and mixing and agitating the coarsely crushed leaf tobacco with a solvent, such as water, thereby extracting a water-soluble component from the aged leaf tobacco.
(2) The step of separating into a water extract containing the water-soluble component and a residue.
(3) The step of drying the water extract under vacuum for concentration.

(4) The step of adding pulp to the residue and fiberizing the residue in a refiner to prepare a mixture (a homogenization step).
(5) The step of papermaking the mixture of the fiberized residue and the pulp.
(6) The step of adding a concentrate of the water extract to the paper-made sheet and drying the paper-made sheet to form a tobacco sheet.

[0047] This method for forming a tobacco sheet may further include the step of removing a component, such as a nitrosamine (see Japanese Unexamined Patent Application Publication (Translation of PCT Application) No. 2004-510422).

<Method for Forming Tobacco Sheet (Casting Method)>

[0048] A method for forming a tobacco sheet by a casting method (slurry method) may include the following steps, for example.

(1) The step of mixing water, pulp, and a binder with a ground product of aged leaf tobacco to prepare a mixture (a homogenization step).
(2) The step of thinly spreading (casting) and drying the mixture to form a tobacco sheet.

[0049] This method for forming a tobacco sheet may further include the step of irradiating a slurry, which is prepared by mixing water, pulp, and a binder with crushed leaf tobacco, with ultraviolet radiation or X-ray radiation to remove a component, such as a nitrosamine.

<Method for Forming Tobacco Sheet (Rolling Method)>

[0050] A method for forming a tobacco sheet by a rolling method may include the following steps, for example.

(1) The step of mixing water, pulp, and a binder with a ground product of aged leaf tobacco to prepare a mixture (a homogenization step).
(2) The step of feeding the mixture into a plurality of rolling rollers for rolling.
(3) The step of peeling off the rolled product on the rolling rollers with a doctor knife, transferring the rolled product to a net conveyor, and drying the rolled product with a dryer.

[0051] When a tobacco sheet is formed by this method, depending on the purpose, the surface of each rolling roller may be heated or cooled, or the number of revolutions of each rolling roller may be adjusted. A tobacco sheet with a desired basis weight can be formed by adjusting the distance between rolling rollers.

<Average Fiber Length of Tobacco Fiber and Freeness of Mixture in Homogenization Step>

[0052] In the homogenization step in the above methods, to prepare a tobacco sheet with certain strength, tobacco fiber contained in each mixture preferably has an average fiber length of 200 μm or more and 1000 μm or less, and each mixture preferably has a freeness of 20 degree SR or more and 50 degree SR or less. The average fiber length of tobacco fiber is measured by optical automatic analysis (JIS P 8226-2) using unpolarized light at a fiber count of 20,000 or more. The freeness is measured by the Schopper Riegler method (JIS P 8121).

<Dimensions of Tobacco Sheet>

[0053] The length and width of the tobacco sheet are not particularly limited and can be appropriately adjusted according to the filling form in a wrapper described later. The tobacco sheet may have any thickness and preferably has a thickness of 100 μm or more and 1000 μm or less, more preferably 200 μm or more and 600 μm or less, in terms of heat transfer efficiency and strength.

<Composition of Tobacco Sheet>

[0054] The tobacco sheet may have any composition and may contain, for example, aged tobacco leaves, a binder, fiber, such as pulp, an aerosol generator, a flavoring and taste agent, and the like. The aged tobacco leaf content is preferably 50% by mass or more and 95% by mass or less of the total mass of the tobacco sheet. Examples of the binder include polysaccharides, proteins, and synthetic polymers. Examples of the polysaccharides include cellulose

derivatives and naturally occurring polysaccharides.

[0055] Examples of the cellulose derivatives include cellulose ethers, such as methylcellulose, ethylcellulose, hydroxyethylcellulose, hydroxymethylethylcellulose, hydroxypropylcellulose, hydroxypropylmethylcellulose, benzylcellulose, tritylcellulose, cyanoethylcellulose, carboxymethylcellulose, carboxyethylcellulose, and aminoethylcellulose; organic acid esters, such as cellulose acetate, cellulose formate, cellulose propionate, cellulose butyrate, cellulose benzoate, cellulose phthalate, and tosyl cellulose; and inorganic acid esters, such as cellulose nitrate, cellulose sulfate, cellulose phosphate, and cellulose xanthate.

[0056] Examples of the naturally occurring polysaccharides include plant-derived polysaccharides, such as guar gum, tara gum, locust bean gum, tamarind seed gum, pectin, gum arabic, gum tragacanth, karaya gum, ghatti gum, arabinogalactan, flaxseed gum, cassia gum, psyllium seed gum, and Artemisia seed gum; algae-derived polysaccharides, such as carrageenan, agar, alginic acid, propylene glycol alginate esters, furcellaran, and Colpomenia sinuosa extracts; microbial polysaccharides, such as xanthan gum, gellan gum, curdlan, pullulan, Agrobacterium succinoglycan, welan gum, Macrophomopsis gum, and rhamsan gum; crustacean polysaccharides, such as chitin, chitosan, and glucosamine; and starches, such as starch, sodium starch glycolate, pregelatinized starch, and dextrin.

[0057] Examples of the proteins include grain proteins, such as wheat gluten and rye gluten. Examples of the synthetic polymer include polyphosphoric acid, sodium polyacrylate, and polyvinylpyrrolidone. These binders may be used alone or in combination.

[0058] The total of one or more binder contents is preferably 1% by mass or more and 30% by mass or less, more preferably 2% by mass or more and 10% by mass or less, of the total mass of the tobacco sheet. The fiber content, such as the pulp content, is not particularly limited, and the total of one or more fiber contents, such as the total of one or more pulp contents, is preferably 0.5% by mass or more and 30% by mass or less, more preferably 1% by mass or more and 15% by mass or less, of the total mass of the tobacco sheet. The flavoring and taste agent may be the flavoring and taste agent described above. When the tobacco sheet contains the flavoring and taste agent, from the perspective of imparting a good flavor, the flavoring and taste agent content is, but not limited to, for example, typically 10 ppm or more, preferably 10,000 ppm or more, more preferably 50,000 ppm or more, and typically 250,000 ppm or less, preferably 200,000 ppm, more preferably 150,000 ppm or less, still more preferably 100,000 ppm or less.

<Shredded Tobacco of Tobacco Sheet>

[0059] The tobacco sheet may be shredded tobacco of a tobacco sheet (hereinafter also referred to as a shredded tobacco sheet). A shredded tobacco sheet is produced by shredding a tobacco sheet into a predetermined size. A shredded tobacco sheet may have any size and may be prepared by any method. For example, a tobacco sheet is shredded to a width of 0.5 mm or more and 2.0 mm or less and a length of 3 mm or more and 30 mm or less. A shredded tobacco sheet with such a size is preferred for filling a wrapper described later.

[Second Material]

[0060] The second material contains 25% by mass or more of an aerosol generator. The second material containing 25% by mass or more of an aerosol generator can sufficiently generate an aerosol. The second material preferably has an aerosol generator content of 30% by mass or more. The upper limit of the content is, but not limited to, for example, 60% by mass or less.

[0061] The second material preferably contains as little leaf tobacco as possible. The second material containing as little leaf tobacco as possible can prevent a component contained in the leaf tobacco from reducing the vaporization of the aerosol generator. The second material may contain no tobacco component. The second material may contain an aerosol generator and a reinforcing material. The reinforcing material may be the reinforcing material described above. For example, the second material may be a sheet prepared by forming the tobacco sheet without the addition of aged leaf tobacco or the like. The sheet may contain an aerosol generator and a reinforcing material and may contain no aged leaf tobacco or the like.

[Blending Ratio of First Material to Second Material]

[0062] In the tobacco composition according to the present embodiment, the mass ratio of the first material to the second material is preferably first material: second material = 40 to 80:20 to 60. When the mass ratio of the first material is 40% by mass or more (the mass ratio of the second material is 60% by mass or less), the tobacco flavor is further developed. When the mass ratio of the first material is 80% by mass or less (the mass ratio of the second material is 20% by mass or more), the aerosol is further generated. The mass ratio is more preferably first material: second material = 45 to 75:25 to 55, still more preferably first material:second material = 50 to 70:30 to 50, particularly preferably first material: second material = 55 to 65:35 to 45.

[Water Content of Tobacco Composition]

[0063] The water content of the tobacco composition according to the present embodiment may be 10% by mass or more and 15% by mass or less, preferably 11% by mass or more and 13% by mass or less, of the total mass of the tobacco composition. At such a water content, it is possible to reduce the occurrence of a stain on a wrapper filled with the tobacco composition.

[Method for Manufacturing Tobacco Composition]

[0064] The tobacco composition according to the present embodiment may be manufactured by any method and can be manufactured by mixing the first material, the second material, and optionally the other components described above at a predetermined blending ratio. For example, all the materials can be mixed in a rotary cylinder known to those skilled in the art.

[Tobacco-Containing Segment]

[0065] A tobacco-containing segment according to the present embodiment includes a tubular wrapper and a tobacco filler, wherein the tobacco filler contains the tobacco composition according to the present embodiment filled in the wrapper. Due to the tobacco composition according to the present embodiment, the tobacco-containing segment according to the present embodiment can sufficiently develop the tobacco flavor and can sufficiently generate the aerosol.

[0066] The tobacco filler refers to a tubular wrapper filled with the tobacco composition according to the present embodiment in a predetermined manner. The wrapper may be, but is not limited to, a tubular wrapping paper. The tobacco-containing segment is formed, for example, by wrapping with a wrapper, such as a wrapping paper, such that the tobacco composition is on the inside.

[0067] The tobacco-containing segment preferably has a columnar shape. In such a case, the aspect ratio of the longitudinal height of the tobacco-containing segment to the bottom width of the tobacco-containing segment is preferably, but not limited to, one or more. The bottom surface may have any shape, such as polygonal, polygonal with round corners, circular, or elliptical. The bottom width is the diameter of a circular bottom surface, the maximum diameter of an elliptical bottom surface, or the diameter of a circumcircle or the maximum diameter of a circumscribed ellipse when the bottom surface is polygonal or polygonal with round corners. For example, for a circular bottom surface, the diameter thereof can be defined as the width, and the length perpendicular to the diameter is the height. The tobacco-containing segment may have any dimensions and, for example, has a length of 10 mm or more and 70 mm or less and a width of 4 mm or more and 9 mm or less. The tobacco filler in the tobacco-containing segment may have a fitting portion for a heater for heating the tobacco filler.

[0068] The filling density of the tobacco composition in the tobacco filler preferably ranges from 0.026 to 0.041 g/cm^3. A filling density of 0.026 g/cm^3 or more can result in sufficient tobacco flavor, vapor volume described later, and lasting. A filling density of 0.041 g/cm^3 or less can result in a decreased filling amount of tobacco composition and reduced manufacturing costs. The filling density more preferably ranges from 0.028 to 0.039 g/cm^3, still more preferably 0.031 to 0.036 g/cm^3.

[Non-Combustion Heating-Type Flavor Inhaler]

[0069] A non-combustion heating-type flavor inhaler according to the present embodiment includes the tobacco-containing segment according to the present embodiment. Due to the tobacco-containing segment according to the present embodiment, the non-combustion heating-type flavor inhaler according to the present embodiment can sufficiently develop the tobacco flavor and can sufficiently generate the aerosol.

[0070] Fig. 1 illustrates an example of the non-combustion heating-type flavor inhaler according to the present embodiment. A non-combustion heating-type flavor inhaler 1 illustrated in Fig. 1 includes a tobacco-containing segment 2 according to the present embodiment, a tubular cooling segment 3 with a hole 8 on the periphery, a center hole segment 4, and a filter segment 5. The non-combustion heating-type flavor inhaler according to the present embodiment may have another segment, in addition to the tobacco-containing segment, the cooling segment, the center hole segment, and the filter segment.

[0071] The non-combustion heating-type flavor inhaler according to the present embodiment may have any axial length and preferably has an axial length of 40 mm or more and 90 mm or less, more preferably 50 mm or more and 75 mm or less, still more preferably 50 mm or more and 60 mm or less. The non-combustion heating-type flavor inhaler preferably has a circumferential length of 16 mm or more and 25 mm or less, more preferably 20 mm or more and 24 mm or less, still more preferably 21 mm or more and 23 mm or less. For example, the tobacco-containing segment has a length of 20 mm, the cooling segment has a length of 20 mm, the center hole segment has a length of 8 mm, and the filter segment

has a length of 7 mm. The length of the filter segment can be selected in the range of 4 mm or more and 10 mm or less. The airflow resistance of the filter segment is selected in the range of 15 mmH_2O/seg or more and 60 mmH_2O/seg or less per segment. The length of each segment can be appropriately changed according to the manufacturability, quality requirements, and the like. Only the filter segment on the downstream side of the cooling segment without the center hole segment can also function as a non-combustion heating-type flavor inhaler.

[Tobacco-Containing Segment]

[0072] The tobacco-containing segment 2 is the tobacco-containing segment according to the present embodiment. As illustrated in Fig. 1, heating the tobacco-containing segment 2 vaporizes a tobacco component (a flavor component), an aerosol generator, and water contained in the tobacco filler, which are transferred to a mouthpiece segment 6 by inhalation.

[Cooling Segment]

[0073] As illustrated in Fig. 1, the cooling segment 3 may be constituted by a tubular member 7. The tubular member 7 may be, for example, a paper tube prepared by processing a thick paper into a cylindrical shape.

[0074] The cooling segment may have a total surface area of 300 mm^2/mm or more and 1000 mm^2/mm or less. This surface area is the surface area per length (mm) in the cooling segment airflow direction. The cooling segment preferably has a total surface area of 400 mm^2/mm or more, more preferably 450 mm^2/mm or more, and 600 mm^2/mm or less, more preferably 550 mm^2/mm or less.

[0075] It is desirable that the cooling segment have an internal structure with a large total surface area. Thus, in a preferred embodiment, the cooling segment may be formed of a sheet of a thin material that is wrinkled to form a channel and then pleated, gathered, and folded. More folds or pleats within a given volume of the element increase the total surface area of the cooling segment.

[0076] In some embodiments, the thickness of a constituent material of the cooling segment may be 5 μm or more and 500 μm or less, for example, 10 μm or more and 250 μm or less.

[0077] The aerosol cooling element may be formed from a material with a specific surface area of 10 mm^2/mg or more and 100 mm^2/mg or less. In one embodiment, the specific surface area of a constituent material may be approximately 35 mm^2/mg. The specific surface area can be determined in consideration of a material with a known width and thickness. For example, the material may be poly(lactic acid) with an average thickness of 50 μm and a variation of ±2 μm. When the material also has a known width of, for example, 200 mm or more and 250 mm or less, the specific surface area and density can be calculated.

[0078] The tubular member 7 and a mouthpiece lining paper 12 described later have a hole 8 passing therethrough. The hole 8 allows the outside air to be introduced into the cooling segment 3 during inhalation. This brings the outside air into contact with an aerosol vaporized component generated by heating the tobacco-containing segment 2, decreases the temperature of the aerosol vaporized component, liquefies the aerosol vaporized component, and forms an aerosol. The hole 8 may have any diameter (full length), for example, a diameter in the range of 0.5 mm or more and 1.5 mm or less. The number of holes 8 may be, but is not limited to, one or two or more. For example, a plurality of holes 8 may be provided on the periphery of the cooling segment 3.

[0079] The amount of outside air introduced through the hole 8 is preferably 85% by volume or less, more preferably 80% by volume or less, of the volume of the whole gas inhaled by the user. When the amount of outside air is 85% by volume or less, it is possible to sufficiently reduce the decrease in flavor due to dilution with the outside air. This is also referred to as a ventilation ratio. The lower limit of the ventilation ratio is preferably 55% by volume or more, more preferably 60% by volume or more, in terms of cooling performance.

[0080] The cooling segment preferably has less resistance to air passing through the tobacco-containing segment. The cooling segment preferably does not substantially affect the inhalation resistance of the non-combustion heating-type flavor inhaler. The resistance to draw (RTD) is the pressure required to push air through the total length of an object in a test at a flow rate of 17.5 ml/s at 22°C and 101 kPa (760 torr). RTD is typically expressed in mmH_2O and is determined in accordance with ISO 6565: 2011. Thus, the pressure drop from the upstream end of the cooling segment to the downstream end of the cooling segment is preferably small. To achieve this, preferably, the longitudinal porosity is more than 50%, and the airflow path through the cooling segment is relatively unconstrained. The longitudinal porosity of the cooling segment may be defined by the ratio of the cross-sectional area of the material forming the cooling segment to the internal cross-sectional area of the cooling segment.

[0081] In some embodiments, generated aerosol may be cooled by 10°C or more when inhaled by the user through the cooling segment. The temperature may be decreased by 15°C or more in another embodiment and by 20°C or more in still another embodiment.

[0082] The cooling segment may be composed of a sheet material selected from the group including metal foils,

polymer sheets, and substantially nonporous paper or thick paper. In one embodiment, the cooling segment may contain a sheet material selected from the group consisting of polyethylene, polypropylene, poly(vinyl chloride), poly(ethylene terephthalate), poly(lactic acid), cellulose acetate, and aluminum foil. A constituent material of the cooling segment may be made from a biodegradable material, for example, nonporous paper, or a biodegradable polymer, such as poly(lactic acid), or a starch copolymer.

[0083] The airflow through the cooling segment preferably does not substantially deflect between adjacent segments. In other words, the airflow through the cooling segment preferably flows along the segment in the longitudinal direction without substantial radial deflection. In some embodiments, the cooling segment is formed from a low-porosity or substantially nonporous material, except for longitudinally extending channels. A material used to define or form a longitudinally extending channel, for example, a wrinkled or gathered sheet, has low porosity or is substantially nonporous.

[0084] As described above, the cooling segment may include a sheet of an appropriate constituent material that is wrinkled, pleated, gathered, or folded. A cross-sectional profile of such an element may have randomly oriented channels. The cooling segment may be formed by another means. For example, the cooling segment may be formed from a bundle of longitudinally extending tubes. The cooling segment may be formed by extrusion, forming, lamination, injection, or shredding of an appropriate material.

[0085] The cooling segment may be formed, for example, by wrapping a pleated, gathered, or folded sheet material with a wrapping paper. In some embodiments, the cooling segment may include a sheet of a wrinkled material gathered into a rod shape and joined together by a wrapper, for example, a wrapping paper of filter paper.

[0086] The cooling segment may be formed in a rod shape with an axial length of, for example, 7 mm or more and 28 mm or less. For example, the cooling segment may have an axial length of 18 mm.

[0087] In some embodiments, the cooling segment is substantially circular in its axial cross-section and may have a diameter of 5 mm or more and 10 mm or less. For example, the cooling segment may have a diameter of approximately 7 mm.

[Center Hole Segment]

[0088] The center hole segment is composed of a fill layer with one or more hollow portions and an inner plug wrapper (inner wrapping paper) covering the fill layer. For example, as illustrated in Fig. 1, the center hole segment 4 is composed of a second fill layer 9 with a hollow portion and a second inner plug wrapper 10 covering the second fill layer 9. The center hole segment 4 has a function of increasing the strength of the mouthpiece segment 6. The second fill layer 9 may be, for example, a rod with an inside diameter of cp5.0 mm or more and φ1.0 mm or less in which cellulose acetate fibers are densely packed and a plasticizer containing triacetin is added in an amount of 6% by mass or more and 20% by mass or less of the mass of cellulose acetate and is hardened. The fibers in the second fill layer 9 have a high filling density, and air or an aerosol flows only through the hollow portion during inhalation and rarely flows through the second fill layer 9. The second fill layer 9 inside the center hole segment 4 is a fiber fill layer, and the touch from the outside during use rarely causes discomfort to the user. The center hole segment 4 may have no second inner plug wrapper 10 and may maintain its shape by thermoforming.

[Filter Segment]

[0089] The filter segment may have any structure and may be composed of one or more fill layers. The outer side of the fill layer(s) may be wrapped with one or more wrapping papers. The airflow resistance per segment of the filter segment can be appropriately changed depending on the amount, material, and the like of filler in the filter segment. For example, when the filler is cellulose acetate fibers, increasing the amount of cellulose acetate fibers in the filter segment can increase the airflow resistance. When the filler is cellulose acetate fibers, the filling density of the cellulose acetate fibers may range from 0.13 to 0.18 g/cm^3. The airflow resistance is a value measured with an airflow resistance measuring instrument (trade name: SODIMAX, manufactured by SODIM).

[0090] The filter segment may have any circumferential length, which preferably ranges from 16 to 25 mm, more preferably 20 to 24 mm, still more preferably 21 to 23 mm. The axial length of the filter segment can be selected from 4 to 10 mm and is selected to have an airflow resistance in the range of 15 to 60 mmH_2O/seg. The filter segment preferably has an axial length in the range of 5 to 9 mm, more preferably 6 to 8 mm. The filter segment may have any cross-sectional shape, for example, a circular shape, an elliptical shape, a polygonal shape, or the like. A breakable capsule containing a flavoring agent, flavoring agent beads, or a flavoring agent may be added directly to the filter segment.

[0091] As illustrated in Fig. 1, the center hole segment 4 and the filter segment 5 can be connected using an outer plug wrapper (outer wrapping paper) 11. The outer plug wrapper 11 may be, for example, cylindrical paper. The tobacco-containing segment 2, the cooling segment 3, and the connected center hole segment 4 and filter segment 5 can be connected using the mouthpiece lining paper 12. These connections can be made, for example, by applying an adhesive, such as a vinyl acetate adhesive, to the inner surface of the mouthpiece lining paper 12, inserting the three segments

therein, and wrapping the three segments. These segments may be connected multiple times with a plurality of lining papers.

[Non-Combustion Heating-Type Flavor Inhalation System]

[0092] A non-combustion heating-type flavor inhalation system according to the present embodiment can include the non-combustion heating-type flavor inhaler according to the present embodiment and a heating device for heating the tobacco-containing segment of the non-combustion heating-type flavor inhaler. The non-combustion heating-type flavor inhalation system according to the present embodiment may have another constituent, in addition to the non-combustion heating-type flavor inhaler according to the present embodiment and the heating device.

[0093] Fig. 2 illustrates an example of the non-combustion heating-type flavor inhalation system according to the present embodiment. The non-combustion heating-type flavor inhalation system illustrated in Fig. 2 includes the non-combustion heating-type flavor inhaler 1 according to the present embodiment and a heating device 13 for heating the tobacco-containing segment of the non-combustion heating-type flavor inhaler 1 from the outside.

[0094] Fig. 2(a) illustrates a state before the non-combustion heating-type flavor inhaler 1 is inserted into the heating device 13, and Fig. 2(b) illustrates a state in which the non-combustion heating-type flavor inhaler 1 is inserted into the heating device 13 and is heated. The heating device 13 illustrated in Fig. 2 includes a body 14, a heater 15, a metal tube 16, a battery unit 17, and a control unit 18. The body 14 has a tubular recess 19. The heater 15 and the metal tube 16 are arranged on the inner side surface of the recess 19 at a position corresponding to the tobacco-containing segment of the non-combustion heating-type flavor inhaler 1 inserted into the recess 19. The heater 15 may be an electrical resistance heater and is heated by an electric power supplied from the battery unit 17 according to an instruction from the control unit 18 for temperature control. Heat generated by the heater 15 is transferred to the tobacco-containing segment of the non-combustion heating-type flavor inhaler 1 through the metal tube 16 with high thermal conductivity.

[0095] Although there is a space between the outer circumference of the non-combustion heating-type flavor inhaler 1 and the inner circumference of the metal tube 16 in schematically illustrated Fig. 2(b), it is actually desirable that for efficient heat transfer there be no space between the outer circumference of the non-combustion heating-type flavor inhaler 1 and the inner circumference of the metal tube 16. The heating device 13 heats the tobacco-containing segment of the non-combustion heating-type flavor inhaler 1 from the outside but may heat it from the inside.

[0096] The heating temperature of the heating device is preferably, but is not limited to, 400°C or less, more preferably 150°C or more and 400°C or less, still more preferably 200°C or more and 350°C or less. The heating temperature refers to the temperature of the heater of the heating device.

EXAMPLES

[0097] Although specific examples of the present embodiment are described below, the present invention is not limited to these examples.

[Example 1]

(1) Preparation of First Material

[0098] Leaf tobacco (flue-cured) was shredded to a width of 1.0 mm to prepare shredded leaf tobacco as the first material. The shredded leaf tobacco contained no aerosol generator. The first material had a CBT content of 0.08% by mass.

(2) Preparation of Second Material

[0099] A sheet containing 33% by mass of glycerin as an aerosol generator and containing no tobacco component was prepared as the second material. More specifically, citrus fiber (trade name: Herbacel AQ Plus, manufactured by DSP Gokyo Food & Chemical Co., Ltd.) and glycerin were blended in a mixer to prepare a mixture. On the other hand, a binder carboxymethylcellulose (trade name: Sunrose F30MC, manufactured by Nippon Paper Industries Co., Ltd.) and water were mixed and swelled in a mixer to prepare a binder liquid. The mixture and the binder liquid were then mixed in a mixer to prepare a wet powder. Table 1 shows the amount of each component of the wet powder blended.

[Table 1]

	DB mass%	WB mass%
Citrus fiber	51.4	43.4

(continued)

	DB mass%	WB mass%
Binder	1.4	1.1
Glycerin	47	25.5
Water content	-	30
DB: dry basis WB: wet basis		

[0100] The wet powder was kneaded six times at room temperature in a kneader (DG-1 manufactured by Dalton Corporation). The screw speed was 38.5 rpm. The kneaded wet powder was put between two Teflon (registered trademark) films (NITOFLON No. 900UL manufactured by Nitto Denko Corporation) and was rolled in four stages to a predetermined thickness (more than 100 μm) using a calender (manufactured by Yuri Roll Machine Co., Ltd.). Thus, a laminate with a layered structure of film/wet sheet/film and a thickness of 105 μm was prepared. The roll gaps in the first to fourth stages were 650 μm, 330 μm, 180 μm, and 5 μm, respectively. The roll gap in the fourth stage was larger than the thickness of the finally prepared sheet because the sheet released from the pressure between the rollers expanded nearly to the final thickness. One of the Teflon (registered trademark) films was peeled off from the laminate, and the laminate was dried with a forced-air dryer at 80°C for 1 to 2 minutes. The other film was then peeled off, and the wet sheet was dried under the same conditions. The dried sheet was shredded to a width of 0.8 mm and a length of 9.5 mm. The second material was prepared through these steps.

(3) Preparation of Tobacco Composition

[0101] The first material and the second material were mixed such that the mass ratio of the first material to the second material was first material:second material = 60:40, thereby preparing a tobacco composition. The tobacco composition had a glycerin content of 13.2% by mass. Table 2 shows each blending ratio of the tobacco composition and the aerosol generator (glycerin) content.

(4) Preparation of Non-Combustion Heating-type Flavor inhaler

[0102] A tobacco sheet filled in a tobacco-containing segment of a commercially available non-combustion heating-type flavor inhaler (trade name: Ploom S Mevius, manufactured by Japan Tobacco, Inc.) was taken out, and, instead, the tobacco-containing segment was filled with the tobacco composition to prepare a non-combustion heating-type flavor inhaler for evaluation. The tobacco composition had a filling density of 0.033 g/cm^3.

(5) Evaluation

[0103] The non-combustion heating-type flavor inhaler was heated using Ploom S (trade name, manufactured by Japan Tobacco, Inc.), and the tobacco flavor, vapor volume, and lasting were evaluated by seven panelists (a to g). The "tobacco flavor" refers to the degree of taste and flavor of tobacco. The "vapor volume" refers to the feeling of vapor caused by the aerosol. The "lasting" refers to the feeling of vapor lasting until the latter part of use. With reference to a commercially available non-combustion-type cigarette (trade name: Ploom S Mevius, manufactured by Japan Tobacco, Inc.) composed of one type of shredded tobacco, the three items described above were evaluated with a score of 1 to 5, that is, 1: very low, 2: low, 3: normal, 4: high, and 5: very high. A difference in average score was tested by a two-tailed test. The seven panelists (a to g) were sufficiently trained using several samples with different concentrations, and it was confirmed that the score thresholds of "tobacco flavor", "vapor volume", and "lasting" were the same and unified among the panelists. Table 3 shows the evaluation results.

[0104] In Table 3, "average" refers to the average of the scores of each panelist. "Variance" refers to the variance of the scores of each panelist. Sufficiently small variances including those in the comparative examples for all the evaluation items indicate a small difference in evaluation between the subjects and sufficiently exhibited characteristics. "P-value (two tailed)" refers to the probability of observing an extreme difference from the actual observed value and is typically used in statistics to determine whether there is a significant difference between two results. Calculation for the results of Comparative Example 1 and the results of Comparative Example 2 and Examples 1 and 2 in the present results for the same evaluation items showed a significant difference of 5% in all the evaluation items. In Table 3, "*" denotes a significant difference of 5%. The "p-value" calculation results show that the results of all the examples for the evaluation items in this sensory evaluation results are statistically significantly different from those of the comparative examples.

[Example 2]

(1) Preparation of First Material

[0105] As the first material, a composition was prepared by mixing 42 parts by mass of a tobacco sheet and 18 parts by mass of leaf tobacco. The tobacco sheet was prepared by the method for forming a tobacco sheet (papermaking method). The tobacco sheet had a glycerin content of 3% by mass. The leaf tobacco was a leaf tobacco (flue-cured) shredded to a width of 1.0 mm and containing no aerosol generator. The first material had a CBT content of 0.074% by mass.

(2) Preparation of Second Material

[0106] The second material was prepared in the same manner as in Example 1.

(3) Preparation of Tobacco Composition

[0107] The first material and the second material were mixed such that the mass ratio of the first material to the second material was first material:second material = 60:40, thereby preparing a tobacco composition. The tobacco composition had a glycerin content of 14.5% by mass. Table 2 shows each blending ratio of the tobacco composition and the aerosol generator (glycerin) content.

(4) Preparation and Evaluation of Non-Combustion Heating-Type Flavor Inhaler

[0108] A non-combustion heating-type flavor inhaler was manufactured using the tobacco composition and evaluated in the same manner as in Example 1. Table 3 shows the results.

[Comparative Example 1]

(1) Preparation of Tobacco Composition (First Material)

[0109] A tobacco sheet containing 15.0% by mass of an aerosol generator glycerin was prepared as the first material. More specifically, the method for forming a tobacco sheet (papermaking method) was used. The first material had a CBT content of 0.044% by mass. The first material was a tobacco composition. Table 2 shows each blending ratio of the tobacco composition and the aerosol generator (glycerin) content.

(2) Preparation and Evaluation of Non-Combustion Heating-Type Flavor Inhaler

[0110] A non-combustion heating-type flavor inhaler was manufactured using the tobacco composition and evaluated in the same manner as in Example 1. Table 3 shows the results.

[Comparative Example 2]

(1) Preparation of First Material and Second Material

[0111] The first material and the second material were prepared in the same manner as in Example 1.

(2) Preparation of Tobacco Composition

[0112] The first material and the second material were mixed such that the mass ratio of the first material to the second material was first material: second material = 90:10, thereby preparing a tobacco composition. The tobacco composition had a glycerin content of 3.3% by mass. Table 2 shows each blending ratio of the tobacco composition and the aerosol generator (glycerin) content.

(3) Preparation and Evaluation of Non-Combustion Heating-Type Flavor Inhaler

[0113] A non-combustion heating-type flavor inhaler was manufactured using the tobacco composition and evaluated in the same manner as in Example 1. Table 3 shows the results.

[Table 2]

	Blending ratio (mass%)			Aerosol generator content (mass%)			
	First material		Second material	First material		Second material	Tobacco composition
	Tobacco sheet	Leaf tobacco		Tobacco sheet	Leaf tobacco		
Example 1	-	60	40	-	0	33	13.2
Example 2	42	18	40	3	0	33	14.5
Comparative example 1	100	-	-	15	-	-	15.0
Comparative example 2	-	90	10	-	0	33	3.3

[0114]

[Table 3]

	Example 1			Example 2			Comparative example 1			Comparative example 2		
	Tobacco flavor	Vapor volume	Lasting	Tobacco flavor	Vapor volume	Lasting	Tobacco flavor	Vapor volume	Lasting	Tobacco flavor	Vapor volume	Lasting
Panelist a	5	5	4	5	5	5	3	3	3	5	2	2
Panelist b	4	5	5	5	4	4	3	2	4	5	2	2
Panelist c	4	5	4	5	5	4	3	3	3	4	1	2
Panelist d	4	4	5	5	4	5	3	3	3	5	2	1
Panelist e	4	4	4	4	5	5	4	4	3	4	1	3
Panelist f	4	5	5	5	5	4	3	3	3	5	1	2
Panelist g	3	5	5	5	5	4	3	3	3	5	1	2
Average	4.00	4.57	4.57	4.86	4.71	4.43	3.14	3.00	3.14	4.71	1.43	2.00
Variance	0.58	0.53	0.53	0.38	0.49	0.53	0.38	0.58	0.38	0.49	0.53	0.58
p-value (two tailed)	*	*	*	*	*	*	-	-	-	*	*	*

[Example 3]

(1) Preparation of First Material

[0115] As the first material, a composition was prepared by mixing 36 parts by mass of a tobacco sheet and 24 parts by mass of leaf tobacco. The tobacco sheet was prepared by the method for forming a tobacco sheet (papermaking method). The tobacco sheet had a glycerin content of 15% by mass. The leaf tobacco was shredded leaf tobacco prepared by shredding leaf tobacco (flue-cured) to a width of 1.0 mm and adding 7% by mass of glycerin to the shredded leaf tobacco. The first material had a CBT content in the range of 1 to 1000 ppm by mass.

(2) Preparation of Second Material

[0116] A sheet containing 25% by mass of glycerin and no tobacco component was prepared as the second material in the same manner as in Example 1.

(3) Preparation of Tobacco Composition

[0117] The first material and the second material were mixed such that the mass ratio of the first material to the second material was first material:second material = 60:40, thereby preparing a tobacco composition. The tobacco composition had a glycerin content of 17.1% by mass. Table 4 shows each blending ratio of the tobacco composition and the aerosol generator (glycerin) content.

(4) Preparation and Evaluation of Non-Combustion Heating-Type Flavor Inhaler

[0118] A non-combustion heating-type flavor inhaler was manufactured using the tobacco composition and evaluated in the same manner as in Example 1. Table 5 shows the results.

[Example 4]

(1) Preparation of First Material

[0119] The first material was prepared in the same manner as in Example 3.

(2) Preparation of Second Material

[0120] A sheet containing 33% by mass of glycerin and no tobacco component was prepared as the second material in the same manner as in Example 1.

(3) Preparation of Tobacco Composition

[0121] The first material and the second material were mixed such that the mass ratio of the first material to the second material was first material:second material = 60:40, thereby preparing a tobacco composition. The tobacco composition had a glycerin content of 20.3% by mass. Table 4 shows each blending ratio of the tobacco composition and the aerosol generator (glycerin) content.

(4) Preparation and Evaluation of Non-Combustion Heating-Type Flavor Inhaler

[0122] A non-combustion heating-type flavor inhaler was manufactured using the tobacco composition and evaluated in the same manner as in Example 1. Table 5 shows the results.

[Example 5]

(1) Preparation of First Material

[0123] The first material was prepared in the same manner as in Example 3.

(2) Preparation of Second Material

[0124] A sheet containing 40% by mass of glycerin and no tobacco component was prepared as the second material in the same manner as in Example 1.

(3) Preparation of Tobacco Composition

[0125] The first material and the second material were mixed such that the mass ratio of the first material to the second material was first material:second material = 60:40, thereby preparing a tobacco composition. The tobacco composition had a glycerin content of 23.1% by mass. Table 4 shows each blending ratio of the tobacco composition and the aerosol generator (glycerin) content.

(4) Preparation and Evaluation of Non-Combustion Heating-Type Flavor Inhaler

[0126] A non-combustion heating-type flavor inhaler was manufactured using the tobacco composition and evaluated in the same manner as in Example 1. Table 5 shows the results.

[Example 6]

(1) Preparation of First Material

[0127] As the first material, a composition was prepared by mixing 18 parts by mass of a tobacco sheet and 42 parts by mass of leaf tobacco. The tobacco sheet was prepared by the method for forming a tobacco sheet (papermaking method). The tobacco sheet had a glycerin content of 15% by mass. The leaf tobacco was shredded leaf tobacco prepared by shredding leaf tobacco (flue-cured) to a width of 1.0 mm and adding 7% by mass of glycerin to the shredded leaf tobacco. The first material had a CBT content in the range of 1 to 1000 ppm by mass.

(2) Preparation of Second Material

[0128] A sheet containing 33% by mass of glycerin and no tobacco component was prepared as the second material in the same manner as in Example 1.

(3) Preparation of Tobacco Composition

[0129] The first material and the second material were mixed such that the mass ratio of the first material to the second material was first material:second material = 60:40, thereby preparing a tobacco composition. The tobacco composition had a glycerin content of 18.8% by mass. Table 4 shows each blending ratio of the tobacco composition and the aerosol generator (glycerin) content.

(4) Preparation and Evaluation of Non-Combustion Heating-Type Flavor Inhaler

[0130] A non-combustion heating-type flavor inhaler was manufactured using the tobacco composition and evaluated in the same manner as in Example 1. Table 5 shows the results.

[Table 4]

	Blending ratio (mass%)			Aerosol generator content (mass%)			
	First material		Second material	First material		Second material	Tobacco composition
	Tobacco sheet	Leaf tobacco		Tobacco sheet	Leaf tobacco		
Comparative example 1	100	-	-	15	-	-	15.0
Example 3	36	24	40	15	7	25	17.1
Example 4	36	24	40	15	7	33	20.3
Example 5	36	24	40	15	7	40	23.1

(continued)

	Blending ratio (mass%)			Aerosol generator content (mass%)			
	First material		Second material	First material		Second material	Tobacco composition
	Tobacco sheet	Leaf tobacco		Tobacco sheet	Leaf tobacco		
Example 6	18	42	40	15	7	33	18.8

[Table 5]

	Comparative example 1			Example 3			Example 4			Example 5			Example 6		
	Tobacco flavor	Vapor volume	Lasting	Tobacco flavor	Vapor volume	Lasting	Tobacco flavor	Vapor volume	Lasting	Tobacco flavor	Vapor volume	Lasting	Tobacco flavor	Vapor volume	Lasting
Panelist a	3	3	3	5	4	4	5	5	4	3	5	5	5	5	5
Panelist b	3	2	4	4	4	5	4	5	5	4	4	5	5	4	4
Panelist c	3	3	3	3	4	4	4	5	4	4	5	4	5	5	4
Panelist d	3	3	3	5	4	5	3	4	5	5	4	5	5	4	5
Panelist e	3	4	3	5	4	4	4	4	4	4	5	5	4	4	5
Panelist f	3	3	3	4	4	5	4	5	4	4	5	4	5	4	4
Panelist g	3	3	3	4	5	3	4	4	5	3	5	4	5	5	4
Average	3.14	3.00	3.14	4.29	4.14	4.29	4.00	4.57	4.43	3.86	4.71	4.57	4.86	4.43	4.43
Variance	0.38	0.58	0.38	0.76	0.38	0.76	0.58	0.53	0.53	0.69	0.49	0.53	0.38	0.53	0.53
p-value (two tailed)	-	-	-	*	*	*	*	*	*	*	*	*	*	*	*

[Example 7]

(1) Preparation of First Material

[0131] As the first material, a composition was prepared by mixing 48 parts by mass of a tobacco sheet and 32 parts by mass of leaf tobacco. The tobacco sheet was prepared by the method for forming a tobacco sheet (papermaking method). The tobacco sheet had a glycerin content of 15% by mass. The leaf tobacco was shredded leaf tobacco prepared by shredding leaf tobacco (flue-cured) to a width of 1.0 mm and adding 7% by mass of glycerin to the shredded leaf tobacco. The first material had a CBT content in the range of 1 to 1000 ppm by mass.

(2) Preparation of Second Material

[0132] A sheet containing 33% by mass of glycerin and no tobacco component was prepared as the second material in the same manner as in Example 1.

(3) Preparation of Tobacco Composition

[0133] The first material and the second material were mixed such that the mass ratio of the first material to the second material was first material: second material = 80:20, thereby preparing a tobacco composition. The tobacco composition had a glycerin content of 16.0% by mass. Table 6 shows each blending ratio of the tobacco composition and the aerosol generator (glycerin) content.

(4) Preparation and Evaluation of Non-Combustion Heating-Type Flavor Inhaler

[0134] A non-combustion heating-type flavor inhaler was manufactured using the tobacco composition and evaluated in the same manner as in Example 1. Table 7 shows the results.

[Example 8]

(1) Preparation of First Material

[0135] The first material was prepared in the same manner as in Example 7.

(2) Preparation of Second Material

[0136] A sheet containing 16.5% by mass of glycerin, 16.5% by mass of propylene glycol, and no tobacco component was prepared as the second material in the same manner as in Example 1.

(3) Preparation of Tobacco Composition

[0137] The first material and the second material were mixed such that the mass ratio of the first material to the second material was first material: second material = 80:20, thereby preparing a tobacco composition. The tobacco composition had a glycerin content of 16.0% by mass. Table 6 shows each blending ratio of the tobacco composition and the aerosol generator (glycerin, propylene glycol) content.

(4) Preparation and Evaluation of Non-Combustion Heating-Type Flavor Inhaler

[0138] A non-combustion heating-type flavor inhaler was manufactured using the tobacco composition and evaluated in the same manner as in Example 1. Table 7 shows the results.

[Table 6]

	Blending ratio (mass%)			Aerosol generator content (mass%)				
	First material		Second material	First material		Second material		Tobacco composition
	Tobacco sheet	Leaf tobacco		Tobacco sheet (Glycerin)	Leaf tobacco (Glycerin)	Glycerin	Propylene glycol	
Comparative example 1	100	-	-	15	-	-	-	15.0
Example 7	48	32	20	15	7	33	-	16.0
Example 8	48	32	20	15	7	16.5	16.5	16.0

[Table 7]

	Comparative example 1			Example 7			Example 8		
	Tobacco flavor	Vapor volume	Lasting	Tobacco flavor	Vapor volume	Lasting	Tobacco flavor	Vapor volume	Lasting
Panelist a	3	3	3	5	3	4	5	4	3
Panelist b	3	2	4	4	4	5	4	4	4
Panelist c	3	3	3	3	4	5	4	3	4
Panelist d	3	3	3	5	4	5	5	4	4
Panelist e	4	4	3	5	5	4	4	4	4
Panelist f	3	3	3	4	4	5	5	4	4
Panelist g	3	3	3	4	5	3	4	4	5
Average	3.14	3.00	3.14	4.29	4.14	4.43	4.43	3.86	4.00
Variance	0.38	0.58	0.38	0.76	0.69	0.79	0.53	0.38	0.58
p-value (two tailed)	-	-	-	*	*	*	*	*	*

REFERENCE SIGNS LIST

[0139]

1 non-combustion heating-type flavor inhaler
2 tobacco-containing segment
3 cooling segment
4 center hole segment
5 filter segment
6 mouthpiece segment
7 tubular member
8 hole
9 second fill layer
10 second inner plug wrapper
11 outer plug wrapper
12 mouthpiece lining paper
13 heating device
14 body
15 heater
16 metal tube
17 battery unit
18 control unit
19 recess

Claims

1. A tobacco composition comprising:

a first material containing a tobacco component; and
a second material containing 25% by mass or more of an aerosol generator,
wherein the first material has an aerosol generator content of less than 25% by mass,
a ratio of a mass of the second material to a total mass of the first material and the second material is 15% by mass or more,

the first material is composed of leaf tobacco or is composed of a tobacco sheet and leaf tobacco, and a mass ratio of the tobacco sheet to the leaf tobacco is tobacco sheet: leaf tobacco = 0 to 70:30 to 100.

2. The tobacco composition according to claim 1, wherein the mass ratio of the tobacco sheet to the leaf tobacco is tobacco sheet: leaf tobacco = 0 to 50:50 to 100.

3. The tobacco composition according to claim 1 or 2, wherein the mass ratio of the tobacco sheet to the leaf tobacco is tobacco sheet: leaf tobacco = 0 to 30:70 to 100.

4. The tobacco composition according to any one of claims 1 to 3, for use in a non-combustion heating-type flavor inhaler.

5. A tobacco-containing segment comprising a tubular wrapper and a tobacco filler, wherein the tobacco filler contains the tobacco composition according to any one of claims 1 to 4 filled in the wrapper.

6. The tobacco-containing segment according to claim 5, wherein the tobacco composition has a filling density in the range of 0.026 to 0.041 g/cm^3.

7. The tobacco-containing segment according to claim 5 or 6, wherein the tobacco composition has a filling density in the range of 0.028 to 0.039 g/cm^3.

8. The tobacco-containing segment according to any one of claims 5 to 7, wherein the tobacco composition has a filling density in the range of 0.031 to 0.036 g/cm^3.

9. A non-combustion heating-type flavor inhaler comprising the tobacco-containing segment according to any one of claims 5 to 8.

10. A non-combustion heating-type flavor inhalation system comprising:

the non-combustion heating-type flavor inhaler according to claim 9; and
a heating device for heating the tobacco-containing segment.

Fig. 1

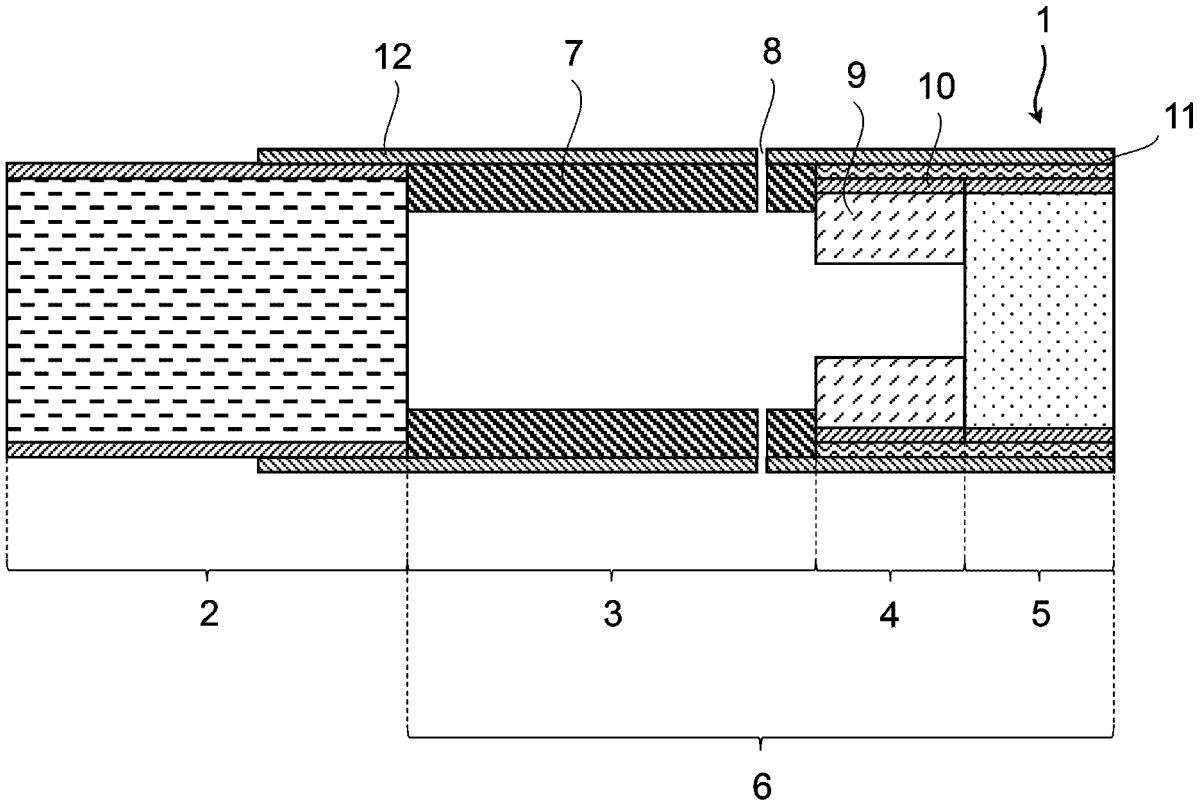
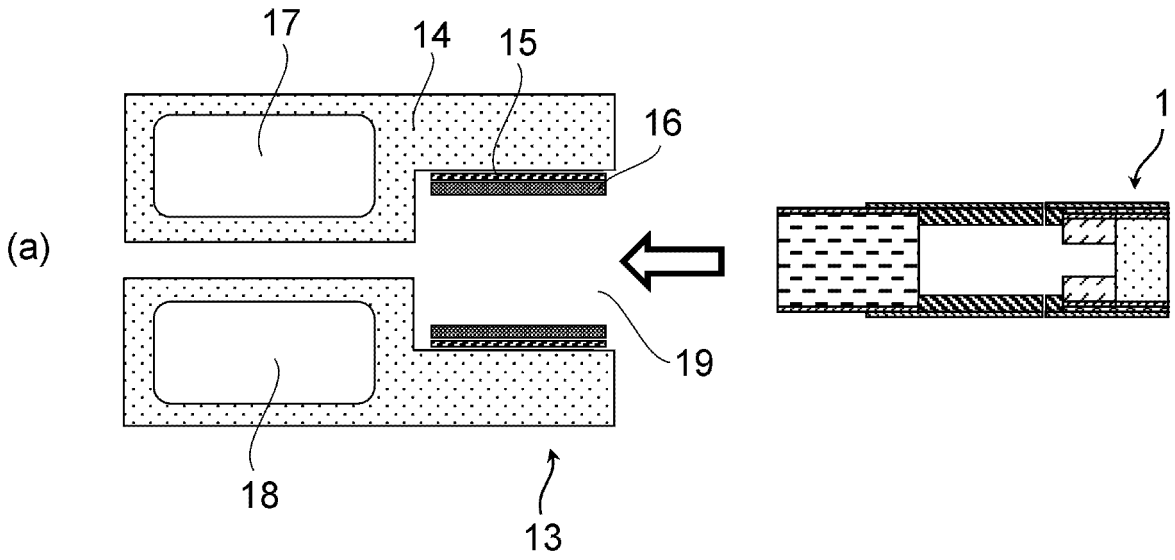


Fig. 2



INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2021/045738

A. CLASSIFICATION OF SUBJECT MATTER

A24B 15/16(2020.01)i; ***A24D 1/20***(2020.01)i; ***A24F 40/20***(2020.01)i
FI: A24B15/16; A24D1/20; A24F40/20

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)

A24B15/16; A24D1/20; A24F40/20

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

Published examined utility model applications of Japan 1922-1996
Published unexamined utility model applications of Japan 1971-2022
Registered utility model specifications of Japan 1996-2022
Published registered utility model applications of Japan 1994-2022

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2020/183175 A1 (NICOVENTURES TRADING LIMITED) 17 September 2020 (2020-09-17) page 10, lines 9-21, page 11, line 20 to page 12, line 35, page 17, lines 5-18, page 18, lines 23-28, table 9c, fig. 4, 6	1-10
Y		6-10
X	CN 108576932 A (SICHUAN SANLIAN NEW MATERIAL CO., LTD.) 28 September 2018 (2018-09-28) abstract, examples 1-4, fig. 1	1-5, 9-10
Y		6-10
A	JP 2012-525137 A (BRITISH AMERICAN TOBACCO (INVESTMENTS) LTD.) 22 October 2012 (2012-10-22) paragraphs [0038]-[0040], [0047]-[0048]	1-10

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

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"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	Date of mailing of the international search report
01 February 2022	**15 February 2022**
Name and mailing address of the ISA/JP **Japan Patent Office (ISA/JP)** **3-4-3 Kasumigaseki, Chiyoda-ku, Tokyo 100-8915** **Japan**	Authorized officer Telephone No.

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

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/JP2021/045738

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
WO 2020/183175 A1	17 September 2020	(Family: none)	
CN 108576932 A	28 September 2018	(Family: none)	
JP 2012-525137 A	22 October 2012	US 2012/0312314 A1 paragraphs [0039]-[0041], [0047] WO 2010/125386 A1 KR 10-2012-0005043 A CN 102421307 A	

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

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- JP 2014515274 W **[0005]**
- JP 2019503659 W **[0005]**
- JP 2013502232 W **[0005]**
- JP 7184624 A **[0005]**
- JP 2018516075 W **[0005]**
- WO 2011013478 A **[0005]**
- WO 2018139068 A **[0029]**
- JP 2004510422 A **[0047]**

Non-patent literature cited in the description

- abako no jiten (Tobacco Dictionary). Tobacco Academic Studies Center, 31 March 2009 **[0025]**
- Shuuchi kanyou gijutsushu (kouryou) (Well-known and commonly used techniques (flavoring agent). Japan Patent Office, 14 March 2007 **[0034]**
- Saishin koryo no jiten (Dictionary of latest flavoring agents (popular edition). Asakura Publishing Co., Ltd, 25 February 2012 **[0034]**
- Tobacco Flavoring for Smoking Products. R.J. REYNOLDS TOBACCO COMPANY, June 1972 **[0034]**
- Tabako no jiten (Tobacco Dictionary). Tobacco Academic Studies Center, 31 March 2009 **[0045]**