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(54) **FLAVORING-LOADED COMPONENT FOR TOBACCO PRODUCT AND PRODUCTION METHOD FOR SAME**

(57) According to the present invention, a flavoring-loaded component for a tobacco product includes a component for a tobacco product and a flavoring com-

position that is loaded on the component and includes a flavoring and an emulsifier that has an HLB of 1-7.

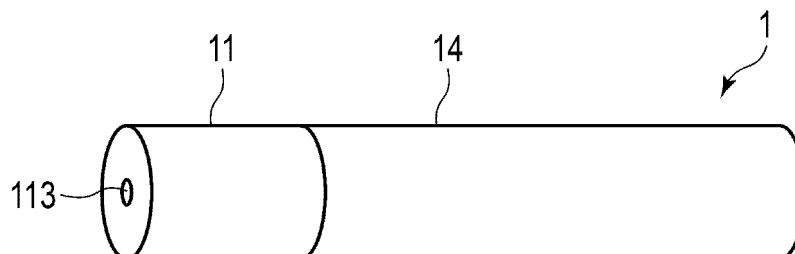


FIG. 1

Description

FIELD

5 **[0001]** The present invention relates to a flavorant-carrying constituent member of a tobacco product and a method of producing the same.

BACKGROUND

10 **[0002]** As a tobacco product including a tobacco flavor source such as cut tobacco, a flavor inhaler with which the user tastes the flavor through inhalation is known. The flavor inhaler can be roughly divided into a combustion-type smoking system typified by a conventional cigarette and a heating-type smoking system.

[0003] As an example of the heating-type smoking system, there has been developed a system using a heating-type flavor inhalation article (hereinafter also referred to as a heating-type cigarette) that includes a tobacco sheet and a filter, having a form similar to that of a conventional cigarette. By heating the heating-type cigarette with a separately prepared heating device, a desired flavor can be enjoyed. For example, Patent Literature 1 describes a heating-type smoking article including a tobacco part, a filter part, and a connecting part that connects the tobacco part and the filter part.

15 **[0004]** It is known that various flavors can be enjoyed by adding flavors to a heating-type cigarette. For example, Patent Literature 2 describes a method for preparing a flavor-containing sheet for a smoking article in which the method includes: a step of extending a raw material slurry on a substrate, the slurry containing polysaccharide including at least one of carrageenan or gellan gum, a flavor, an emulsifier and water; a step of gelling the raw material slurry; and a heat-drying step including heating the gelled raw material and drying it at a sample temperature of 70 to 100°C. Cut pieces of the sheet obtained by this method are blended into, for example, cut tobacco.

20 **[0005]** Furthermore, Patent Literature 3 describes a heating-type flavor suction article that includes a capsule enclosing a flavor.

CITATION LIST

PATENT LITERATURE

30 **[0006]**

Patent Literature 1: International Publication No. 2020/115898

Patent Literature 2: U.S. Patent Application Publication No. 2013/0327346

35 Patent Literature 3: International Publication No. 2010/110226

SUMMARY

TECHNICAL PROBLEM

40 **[0007]** An object of the present invention is to provide a flavorant-carrying constituent member of a tobacco product, including: a flavorant composition; and a constituent member of a tobacco product, in which the flavorant composition does not easily exude to the constituent member of the tobacco product.

45 SOLUTION TO PROBLEM

[0008] According to one aspect, there is provided a flavorant-carrying constituent member of a tobacco product, comprising:

50 a constituent member of a tobacco product; and
a flavorant composition carried on the constituent member, and containing an emulsifier and a flavorant, the emulsifier having an HLB in a range of 1 to 7.

55 **[0009]** According to another aspect, there is provided a method of producing a flavorant-carrying constituent member of a tobacco product, comprising loading, on a constituent member of a tobacco product, a flavorant composition containing an emulsifier and a flavorant, the emulsifier having an HLB in a range of 1 to 7.

ADVANTAGEOUS EFFECTS OF INVENTION

[0010] According to the present invention, there is provided a flavorant-carrying constituent member of a tobacco product, including: a flavorant composition; and a constituent member of a tobacco product, in which the flavorant composition does not easily exude to the constituent member of the tobacco product.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011]

FIG. 1 is a schematic view schematically showing a heating-type flavor inhalation article according to an embodiment of the present invention.

FIG. 2 is a cross-sectional view schematically showing the heating-type flavor inhalation article shown in FIG. 1.

FIG. 3 is a cross-sectional view schematically showing an example of a heating-type smoking system prior to heating.

FIG. 4 is a cross-sectional view schematically showing an example of the heating-type smoking system during heating.

FIG. 5 is a cross-sectional view schematically showing a combustion-type flavor inhalation article according to an embodiment of the present invention.

FIG. 6 is a graph indicating a relationship between the number of puffs and the release amount of menthol for an example of a flavor inhalation article.

FIG. 7 is a graph indicating a relationship between the number of puffs and the release amount of menthol for another example of the flavor inhalation article.

FIG. 8 is a graph indicating a relationship between the number of puffs and the release amount of menthol for still another example of the flavor inhalation article.

FIG. 9 is a graph indicating a relationship between the number of puffs and the release amount of menthol for still another example of the flavor inhalation article.

FIG. 10 is a graph indicating a relationship between the number of puffs and the release amount of menthol for still another example of the flavor inhalation article.

FIG. 11 is a graph indicating a relationship between the number of puffs and the release amount of menthol for still another example of the flavor inhalation article.

DETAILED DESCRIPTION

[0012] Hereinafter, the present invention will be described in detail; however, the following description is intended to provide a detailed description of the present invention, and is not intended to limit the present invention.

<1. Flavorant-Carrying Constituent Member>

[0013] A flavorant-carrying constituent member of a tobacco product includes:

a constituent member of a tobacco product; and

a flavorant composition carried on the constituent member, and containing an emulsifier and a flavorant, the emulsifier having an HLB in a range of 1 to 7.

(Tobacco Product)

[0014] Herein, a tobacco product is a flavor inhalation article with which the user tastes the flavor through inhalation. The flavor inhalation article includes a flavor source, and is any inhalation article with which the user tastes the flavor derived from the flavor source through inhalation. The flavor source included in the flavor inhalation article is preferably a tobacco flavor source. Specific examples of the flavor inhalation article include a combustion-type smoking article which provides the user with the flavor by combusting the flavor source, and a heating-type flavor inhalation article which provides the user with the flavor by heating, not combusting, the flavor source.

(Constituent Member of Tobacco Product)

[0015] A "constituent member of a tobacco product" is a base member for carrying a flavorant composition. Therefore, in the description that follows, a constituent member of a tobacco product is also referred to as a "base member".

[0016] The base member is, for example, a tobacco filler. The tobacco filler is a tobacco material that functions as a

tobacco flavor source in a tobacco product. The tobacco filler is, for example, an aggregate of cut tobacco, sheet tobacco, an aggregate of cut pieces of sheet tobacco, an aggregate of tobacco granules, or a combination thereof. The cut tobacco refers to cut pieces of leaf tobacco (dried tobacco leaves) that are ready to be incorporated into a tobacco product. The sheet tobacco refers to a tobacco molded body obtained by molding a tobacco material, such as cut tobacco or waste leaf tobacco (such as leaf scrap or cut tobacco scrap) generated in leaf processing facilities or manufacturing facilities, into a sheet shape. The tobacco granules refer to a tobacco molded body obtained by molding a tobacco material, such as cut tobacco or waste leaf tobacco (such as leaf scrap or cut tobacco scrap) generated in leaf processing facilities or manufacturing facilities, into a granular shape.

[0017] Herein, when the base member is a tobacco filler, the flavorant-carrying constituent member is referred to as a "flavorant-carrying tobacco filler". Specifically, when the base member is an aggregate of cut tobacco, the flavorant-carrying constituent member is referred to as "flavorant-carrying cut tobacco"; when the base member is sheet tobacco or an aggregate of cut pieces of sheet tobacco, the flavorant-carrying constituent member is referred to as "flavorant-carrying sheet tobacco"; and when the base member is an aggregate of tobacco granules, the flavorant-carrying constituent member is referred to as "flavorant-carrying tobacco granules".

[0018] Alternatively, the base member may be cigarette paper. Herein, when the base member is cigarette paper, the flavorant-carrying constituent member is referred to as a "flavorant-carrying cigarette paper".

[0019] Alternatively, the base member may be a filter. Specifically, the base member may be a filter material (e.g., an aggregate of cellulose acetate fibers, paper, or a film) configuring a filter, or may be a plug wrapper wrapped around the filter material. The paper may or may not be crimped. Herein, when the base member is a filter, the flavorant-carrying constituent member is referred to as a "flavorant-carrying filter".

[0020] Alternatively, the base member may be a tube. The tube is obtained, for example, by rolling up paper. The tube made of paper, that is, the paper tube will be described later. Herein, when the base member is a tube, the flavorant-carrying constituent member is referred to as a "flavorant-carrying paper tube".

[0021] Alternatively, the base member may be a base material of a flavorant filler. The flavorant filler refers to a material with a flavorant carried on a base material such as a film, or metal foil, and is, for example, used together with a tobacco filler in a tobacco product. The flavorant filler may be used by being bonded to a member of a tobacco product. The base material of the flavorant filler does not include a tobacco material, and plays the role of carrying a flavorant. The base member may be cut pieces of the base material of the flavorant filler.

[0022] The base material of the flavorant filler is preferably metal foil. The metal foil may be a thin plate made of a composite or single metal material, or may be a metal foil composite made of a laminate of a metal material and another material (e.g., paper or a film). Examples of the thin plate made of a composite or single metal material include an aluminum foil plate, a copper foil plate, an iron foil plate, and an aluminum alloy foil plate. Examples of the metal foil composite include a laminate of aluminum foil and paper, namely, aluminum-laminated paper. As the aluminum-laminated paper, aluminum-bonded paper obtained by bonding aluminum foil to paper with an adhesive and aluminum-vapor-deposited paper obtained by depositing aluminum foil on paper are known.

[0023] When a metal foil is used as the base member, since the thermal conductivity of metal is high, the flavorant composition carried on the metal foil is easily warmed up when the tobacco product is used (especially when the flavor inhalation article is heated), thus promoting release of the flavorant contained in the flavorant composition.

[0024] Alternatively, the base material of the flavorant filler may be a film. The film may be either an organic material or an inorganic material. The film may be, for example, a polymer film such as a polyethylene terephthalate (PET) film. The base material of the flavorant filler may be of any other material that is capable of carrying the flavorant composition, such as paper, sheet, or non-woven fabric, and its composition or shape is not particularly limited. Herein, when the base member is a base material of the flavorant filler, the flavorant-carrying constituent member is referred to as a "flavorant-carrying base material".

(Flavorant Composition)

[0025] A "flavorant composition" is carried on a base member, and contains an emulsifier and a flavorant, the emulsifier having an HLB in the range of 1 to 7. The flavorant composition releases the flavorant upon heating or combustion of a flavor inhalation article. Alternatively, the flavorant composition releases the flavorant upon contact with vapor generated by heating of the flavor inhalation article or smoke generated by combustion of the flavor inhalation article.

[0026] Herein, the HLB is measured by the Griffin method.

[0027] The emulsifier preferably has an HLB in the range of 2 to 5. Hereinafter, the above-described emulsifier is referred to as a "low HLB emulsifier".

[0028] The melting point of the low HLB emulsifier is, for example, in the range of 40°C to 100°C.

[0029] The low HLB emulsifier is, for example, glycerin fatty acid ester, polyglycerin fatty acid ester, propylene glycol fatty acid ester, sucrose fatty acid ester, sorbitan fatty acid ester, lecithin, or organic acid monoglyceride.

[0030] The glycerin fatty acid ester is, for example, monoglyceride, diglyceride, or triglyceride. Preferably, the glycerin

fatty acid ester is monoglyceride.

[0031] Specific examples of the glycerin fatty acid ester include glyceryl monobehenate, glyceryl monostearate, glyceryl monooleate, and glyceryl monomyristate. The glycerin fatty acid ester is preferably glyceryl monobehenate.

[0032] The polyglycerin fatty acid ester is, for example, diglycerin fatty acid ester, triglycerin fatty acid ester, tetraglycerin fatty acid ester, pentaglycerin fatty acid ester, or decaglycerin fatty acid ester.

[0033] For the polyglycerin fatty acid ester, the kind of fatty acids ester-bonded to the polyglycerin may be one or two or more.

[0034] Specific examples of the polyglycerin fatty acid ester include diglyceryl monostearate, diglyceryl monooleate, tetraglyceryl monostearate, tetraglyceryl monooleate, pentaglyceryl hexastearate, decaglyceryl trioleate, decaglyceryl pentastearate, and decaglyceryl pentaoleate. The polyglycerin fatty acid ester is preferably decaglyceryl pentastearate.

[0035] Specific examples of the propylene glycol fatty acid ester include propylene glycol monostearate, propylene glycol monopalmitate, and propylene glycol monobehenate.

[0036] Specific examples of the sucrose fatty acid ester include sucrose stearate, sucrose palmitate, sucrose oleate, sucrose laurate, sucrose behenate, and sucrose erucate.

[0037] Specific examples of the sorbitan fatty acid ester include sorbitan monostearate, sorbitan monooleate, sorbitan monopalmitate, sorbitan trioleate, sorbitan tribehenate, sorbitan tristearate, sorbitan sesquioleate, and sorbitan sesquisteate.

[0038] Specific examples of the lecithin include vegetable lecithin and enzyme-treated lecithin.

[0039] Specific examples of the organic acid monoglyceride include acetic acid monoglyceride, lactic acid monoglyceride, and citric acid monoglyceride.

[0040] The low HLB emulsifier preferably includes one or more selected from the group consisting of glycerin fatty acid ester, polyglycerin fatty acid ester, propylene glycol fatty acid ester, sucrose fatty acid ester, sorbitan fatty acid ester, and lecithin. More preferably, the low HLB emulsifier includes one or more selected from the group consisting of glycerin fatty acid ester, polyglycerin fatty acid ester, and propylene glycol fatty acid ester. Still more preferably, the low HLB emulsifier includes at least one of glycerin fatty acid ester or polyglycerin fatty acid ester.

(Flavorant)

[0041] The flavorant preferably includes one or more selected from the group consisting of a flavor-presenting material, a taste-presenting material, a plant material, a lipid, and nicotine.

(Flavor-Presenting Material)

[0042] The type of the flavor-presenting material is not particularly limited. Furthermore, the form of the flavor-presenting material is not particularly limited. The flavor-presenting material is, for example, liquid or solid.

[0043] The flavor-presenting material provides a combination of a flavor and taste, or a flavor. Suitable flavors of the flavor-presenting material include, for example, one or more flavors selected from sugar and sugar-based flavors, licorice, cocoa, chocolate, fruit juice and fruit, spices, liquors, herbs, vanilla, and flower-based flavors.

[0044] As the flavor-presenting material, it is possible to use a wide variety of flavor-presenting materials as described in "Collection of Well-known Prior Arts (Flavors)" (March 14, 2007, Japan Patent Office), "Saishin Koryo No Jiten (Fukyu Ban)" [Latest: Encyclopedia of Flavors (trade edition)] (Arai, Soichi; Kobayashi, Akio; Yajima, Izumi; and Kawasaki, Toshiaki, eds. February 25, 2012, Asakura Publishing Co., Ltd.), or "Tobacco Flavoring for Smoking Products" (June 1972, R.J. Reynolds Tobacco Company), for example.

[0045] Examples of flavor-presenting materials include one or more selected from isothiocyanates, indole and derivatives thereof, ethers, esters, ketones, 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. The flavor-presenting material may be a material that provides a cooling or warming sensation.

[0046] Specific examples of the flavor-presenting material include acetanisole, acetophenone, acetylpyrazine, 2-acetylthiazole, alfalfa extract, amyl alcohol, amyl butyrate, trans-anethole, benzaldehyde, benzoin resinoid, benzyl alcohol, benzyl benzoate, benzyl phenylacetate, benzyl propionate, 2,3-butanedione, 2-butanol, butyl butyrate, butyric acid, caramel, β -carotene, L-carvone, β -caryophyllene, cinnamaldehyde, cinnamic acid, cinnamyl alcohol, cinnamyl cinnamate, DL-citronellol, cuminaldehyde, δ -decalactone, γ -decalactone, decanoic acid, 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, ethyl vanillin, ethyl vanillin glucoside, 2-ethyl-3-(5 or 6)-dimethylpyrazine, 5-ethyl-3-hydroxy-4-methyl-2(5H)-furanone, 2-ethyl-3-methylpyrazine, eucalyptol, geraniol, geranyl acetate, guaiacol,

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, 4-hydroxyundecanoic acid sodium salt, β -ionone, isoamyl acetate, isoamyl butyrate, isoamyl phenylacetate, isobutyl acetate, isobutyl phenylacetate, linalool, linalyl acetate, lovage root oil, menthol, menthone, L-menthyl acetate, p-methoxybenzaldehyde, methyl 2-pyrrolyl ketone, methyl anthranilate, methyl phenylacetate, methyl salicylate, 4'-methylacetophenone, methyl cyclopentenolone, 3-methylvaleric acid, myristic acid, nerol, nerolidol, γ -nonalactone, δ -octalactone, octanal, octanoic acid, palmitic acid, ω -pentadecalactone, phenethyl alcohol, phenethyl phenylacetate, phenylacetic acid, piperonal, propenylguaethol, propyl acetate, 3-propylidenephthalide, pyruvic acid, α -terpineol, terpinyl acetate, 5,6,7,8-tetrahydroquinoxaline, 1,5,5,9-tetramethyl-13-oxatricyclo[8.3.0.0.(4.9)]tridecane, 2,3,5,6-tetramethylpyrazine, 2-tridecanone, triethyl citrate, 4-(2,6,6-trimethylcyclohex-1-enyl)but-2-en-4-one, 2,6,6-trimethylcyclohex-2-ene-1,4-dione, 4-(2,6,6-trimethylcyclohexa-1,3-dienyl)but-2-en-4-one, 2,3,5-trimethylpyrazine, γ -undecalactone, γ -valerolactone, vanillin, veratraldehyde, citral, 4-(acetoxymethyl)toluene, 2-methyl-1-butanol, ethyl 10-undecenoate, isoamyl hexanoate, 1-phenylethyl acetate, lauric acid, 8-mercaptomenthone, sinensal, hexyl butyrate, camphor, isopulegol, cineol, eucalyptus oil, 2-1-menthoxyethanol (Coolact® 5), 3-1-menthoxypropane-1,2-diol (Coolact® 10), 1-menthyl 3-hydroxybutyrate (Coolact® 20), p-menthane-3,8-diol (Coolact® 38D), N-(2-hydroxy-2-phenylethyl)-2-isopropyl-5,5-dimethylcyclohexane-1-carboxamide (Coolact® 370), N-[4-(cyanomethyl)phenyl]-2-isopropyl-5,5-dimethylcyclohexanecarboxamide (Coolact® 400), N-(3-hydroxy-4-methoxyphenyl)-2-isopropyl-5,5-dimethylcyclohexanecarboxamide, N-ethyl-p-menthane-3-carboxamide (WS-3), ethyl 2-(p-menthane-3-carboxamido)acetate (WS-5), N-(4-methoxyphenyl)-p-menthanecarboxamide (WS-12), 2-isopropyl-N,2,3-trimethylbutyramide (WS-23), 3-1-menthoxy-2-methylpropane-1,2-diol, 2-1-menthoxyethan-1-ol, 3-1-menthoxypropan-1-ol, 4-1-menthoxybutan-1-ol, menthyl lactate (FEMA 3748), menthone glycerin acetal (Frescolat MGA, FEMA 3807, FEMA3808), 2-(2-1-menthyloxyethyl)ethanol, menthyl glyoxylate, menthyl 2-pyrrolidone-5-carboxylate, menthyl succinate (FEMA 3810), N-(2-(pyridin-2-yl)ethyl)-3-p-menthanecarboxamide (FEMA 4549), N-(ethoxycarbonylmethyl)-p-menthane-3-carboxamide, N-(4-cyanomethylphenyl)-p-menthanecarboxamide, N-(4-aminocarbonylphenyl)-p-menthane, and polyol such as glycerin, propylene glycol, 1,3-butanediol, and polyethylene glycol.

[0047] In addition to the role of providing the taste, polyol can play a role of controlling, in the presence of another flavorant (i.e., a flavorant other than polyol), a release of another flavorant.

[0048] The flavor-presenting material may be either a natural or synthetic flavor-presenting material.

[0049] As the flavor-presenting material, it is preferable to use a combination of propylene glycol and menthol, or menthol.

[0050] When a combination of propylene glycol and menthol is used as the flavor-presenting material, the ratio of the mass of menthol to the mass of propylene glycol is preferably in the range of 0.01 to 100, more preferably in the range of 0.1 to 10.

(Taste-Presenting Material)

[0051] Examples of the taste-presenting material include materials presenting sweetness, sourness, saltiness, umami (savory), bitterness, astringency, richness, or the like.

[0052] Examples of materials presenting sweetness include sugars, sugar alcohols, and sweeteners. Examples of the sugars include monosaccharides, disaccharides, oligosaccharides, and polysaccharides. Examples of the sweeteners include natural sweeteners and synthetic sweeteners.

[0053] Examples of materials presenting sourness 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.

[0054] Examples of materials presenting bitterness include caffeine contained in extracts of coffees or the like, naringin, and wormwood extracts.

[0055] Examples of materials presenting saltiness include sodium chloride, potassium chloride, sodium citrate, potassium citrate, sodium acetate, and potassium acetate.

[0056] Examples of materials presenting umami include sodium glutamate, sodium inosinate, and sodium guanylate.

[0057] Examples of materials presenting astringency include tannin and shibuol.

[0058] The total content of the flavorant in the mass of the flavorant composition is not particularly limited; however, from the viewpoint of providing a good smoking flavor, for example, the content is usually 10 ppm or more, preferably 5000 ppm or more, more preferably 10000 ppm or more, and usually 999990 ppm or less, preferably 999900 ppm or less, more preferably 999000 ppm or less, even more preferably 990000 ppm or less.

(Plant Material)

[0059] The plant material is a ground plant or a plant-derived component. The method for obtaining the plant-derived component is not particularly limited. Examples of the method for obtaining the plant-derived component include extraction

of a component contained in a ground plant with a solvent such as water, an organic solvent, or a mixture thereof, and collection of a component released by heating the ground plant with a collection solvent.

[0060] The ground plant is obtained by grinding a plant. The grinding may be performed using a known grinding mill, and may be either dry grinding or wet grinding.

[0061] As plants, for example, various sites such as roots (including scaly roots (bulbs), tuberous roots (potatoes), corms, etc.), stems, tubers, bark (including stem bark, tree bark, etc.), leaves, flowers (including petals, pistils, stamens, etc.), tree trunks or branches can be used.

[0062] Examples of bulbs include onion, cluster amaryllis, tulip, hyacinth, garlic, scallion, and lily. Examples of corms include crocus, gladiolus, freesia, iris, taro, and konjac. Examples of tuber include cyclamen, anemone, begonia, Chinese artichoke, potato, and Apios (potato bean). Examples of rhizomes include canna, lotus (lotus root), and ginger. Examples of tuberous roots include dahlia, sweet potato, cassava, and Jerusalem artichoke. Examples of rhizophores include genus Dioscorea (yam, Japanese yam, Chinese yam, and other yams). Other examples include turnip, burdock, carrot, radish, and kudzu. Examples of stems include konjac, asparagus, bamboo shoots, udo, radish, and yacon.

[0063] As plants, plants used as herbs or spices can also be used. Specific examples of plants used as herbs or spices include gardenia fruit, kaffir lime leaves, Japanese ginger, mugwort, wasabi, ajowan seed, anise, alfalfa, echinacea, shallot, tarragon, everlasting flower, elder, allspice, orris root, oregano, orange peel, orange flower, orange leaf, Cayenne chili pepper (Cayenne chili pepper), German chamomile, Roman chamomile, cardamom, curry leaf, garlic (garlic), catnip, caraway, caraway seed, fragrant olive, cumin, cumin seed, clove, green cardamom, green pepper, cornflower, saffron, cedar, cinnamon, jasmine, juniper berry, jolokia, ginger (ginger), star anise, spearmint, sumac, sage, savory (savory), celery, celery seed, turmeric (Curcuma), thyme, tamarind, tarragon, chervil (cerfeuil), chives, dill, dill seed, tomato (dried tomato), tonka bean, dried coriander, nutmeg, hibiscus, habanero, jalapeno, bird's eye chili, basil, vanilla, phakchi (coriander), parsley, paprika, hyssop, Piment d'Espelette, pink peppercorn, fenugreek seed, fennel, brown mustard, black cardamom, black cumin, black pepper, vetiver, pennyroyal, peppermint (Japanese mint), horseradish, white pepper, white mustard, poppy seed, porcini, marjoram, mustard seed, Maniguette pepper, marigold, Malva flower, mace, yarrow flower, eucalyptus, lavender, licorice, linden, red clover, red pepper, lemongrass, lemon verbena, lemon balm, lemon peel, rose (rose), rose bud (purple), rose hip, rose petal, rosemary, rose red, laurel (bay leaf), long pepper, sesame (raw sesame, roasted sesame), golden chili pepper, szechuan pepper (hoa jao), Mitaka pepper, Japanese pepper, chili pepper, and yuzu.

[0064] As plants, for example, edible fruits (flesh parts) and seeds such as peaches, blueberries, lemons, oranges, apples, bananas, pineapples, mangoes, grapes, kumquats, melons, plums, almonds, cacaos, coffee, peanuts, sunflowers, olives, walnuts, and other nuts can also be used.

[0065] Furthermore, as plants, the following tea raw materials can also be used. Specific examples thereof include Camellia sinensis, Angelica keiskei, Hydrangea macrophylla, aloe, ginkgo, turmeric, urajirogashi, Siberian ginseng, plantain, kakiadoshi, persimmon, German chamomile, chamomile, Chamaecrista nomame, Chinese quince, chrysanthemum, gymnema, guava, Lycium, mulberry, black soybean, geranium, brown rice, burdock, comfrey, kelp, sakura, saffron, shiitake, perilla, jasmine, ginger, horsetail, Japanese sweet flag, Swertia, buckwheat, Aralia elata, dandelion, Houttuynia cordata, tochu, natamame, elder, privet, adlay, habu, loquat, pine, mate, wheat, Acer maximowiczianum, mugwort, eucalyptus, luo han guo, rooibos, and bitter gourd.

[0066] While kelp is given as a specific example of plants, sea lettuce, green laver, devil weed, laver, arame, seaweed (Collema nigrescense), egonori, gracilaria, Kagome konbu, Ecklonia cava, ganiashi, sea grapes, Ecklonia kurome, konbu, Porphyra yezoensis, dulse, Pyropia kurogii, Ecklonia stolonifera, tengusa, shredded konbu, Arthrothamnus, nori (seaweed), Petalonia binghamiae, hijiki, hitoegusa, hirome, funori, gutweed, Japanese kelp, mekabu, mozuku, wakame, and the like can also be used as plants.

[0067] While brown rice is given as a specific example of plants, other rice varieties such as indica varieties (Indica type, continent-type, long-grain type), glaberrima varieties (African rice), sativa varieties (Asian rice), Javanica varieties (Javanica type, tropical island type, large-grain varieties), Japonica varieties (Japonica type, temperate island type, short-grain varieties), and NERICA (interspecies hybrid of Asian rice and African rice) can also be used as plants. The rice bran thereof can be used as a plant material.

[0068] While wheat is given as a specific example of plants, other wheat species such Setaria italica, oats (cultivated varieties of wild oat, also called oats), barley (barley), wild oats, millet, kodra (kodon millet), wheat (wheat), finger millet, teff, pearl millet, naked barley (barley variant), adlay (fruit, not seed), barnyard millet, fonio, wild rice, Mochi Mugi (mochi variety of barley), Sorghum bicolor (Indian millet, kaoliang, sorghum), corn, and rye can also be used as plants.

[0069] While black soybean is given as specific examples of plants, other legume grains (Fabaceae) such as adzuki, carob, common bean, garden pea, pigeon pea, cluster bean, grass pea (Lathyrus sativus), black lentil, cowpea, winged bean, Macrotyloma geocarpum, fava bean, soybean, ricebean, jack bean, tamarind, tepary bean, sword bean, velvet bean (Mucuna pruriens), Vigna subterranea, chickpea, hyacinth bean, scarlet runner bean, horse gram (Macrotyloma uniflorum), moth bean, lima bean, peanut, mung bean, lupine, lentil, and almond can also be used as plants.

[0070] While buckwheat is given as a specific example of plants, other plants such as amaranth (amaranth, Amaranthus

caudatus), quinoa, and *Fagopyrum tataricum* can also be used as plants.

[0071] While shiitake is given as a specific example of plants, mushrooms such as matsutake, shiitake, *Lactarius hatsudake*, *Lyophyllum shimeji*, truffle, mushroom, and *Agaricus campestris* can also be used as plants.

[0072] The trunks and branches of aromatic trees such as sugar cane (which may be syrup of molasses), sugar beet (beet), cypress, pine, cedar, hiba, camellia and sandalwood as well as bark, leaves and roots of these trees can also be used as plants. Ferns, mosses and the like can also be used as plants. Plants other than the plants listed here as plants can also be used.

[0073] In one example, the ground plant is tea. Different kinds of tea are obtained according to the kind of raw material of tea. On the other hand, even if the kind of raw material is the same, different kinds of tea are obtained depending on the processing method of the raw material. Specific examples of the ground plant include Japanese tea, black tea, ashitaba tea, sweet tea, jiaogulan tea, aloe tea, ginkgo leaf tea, oolong tea, curcuma tea, urajirogashi tea, Siberian ginseng tea, plantain tea, kakiadoshi tea, persimmon leaf tea, German chamomile tea, chamomile tea, *Chamaecrista nomame* tea, Chinese quince tea, chrysanthemum tea, gymnema tea, guava tea, *Lycium* tea, mulberry leaf tea, black soybean tea, geranium tea, brown rice tea, burdock tea, comfrey tea, kelp tea, sakura tea, saffron tea, shiitake tea, perilla tea, jasmine tea, ginger tea, horsetail tea, Japanese sweet flag tea, *Swertia* tea, buckwheat tea, *Aralia elata* tea, dandelion tea, sweet tea, *Houttuynia cordata* tea, tochu tea, natamame tea, elder tea, privet tea, adlay tea, habu Tea, loquat leaf tea, pu-erh tea, safflower tea, pine needle tea, mate tea, barley tea, *Acer maximowiczianum* tea, mugwort tea, eucalyptus tea, *luo han guo* tea, rooibos tea, bitter gourd tea, and the like. As for these teas, tea leaves obtained after drinking may be used. When tea leaves or the like are used, expensive tea or the like can be reused and effectively utilized.

[0074] According to another example, the ground plant is byproduct, strained lees (sake lees or strained grape lees (comprising skin, seeds, stems, etc., of grapes)), or the like from production of sake, wine, or other fermented liquor.

[0075] According to yet another example, the ground plant is a Chinese herbal medicine. Specific examples of Chinese herbal medicines indigo (aisou), *Rubia cordifolia* root (akanekon), *Mallotus bark* (akamekashiwa), gambir (asenyaku), benzoin (ansokukou), *Clematis* root (ireisen), *Artemisia capillaris* (inchinkou), fennel (uigyou), curcuma (turmeric), *Prunus mume* (ubai), *Lindera* root (uyaku), *Quercus salicina* (urajirogashi), bearberry leaf, *rosae fructus* (eijitsu), *Corydalis tuber* (engosaku), *herba radosiae* (enmeisou), *Astragalus* root (uogi), *Scutellaria* root (uogon), *phellodendron bark* (uobaku), *Coptis rhizome* (uoren), *Pruni cortex* (ouhi), *Hypericum erectum* (otogirisou), *Polygala* root (onji), *Sophora japonica* flower (kaika), Long-stamen onion bulb (gaihaku), *Prunella spike* (kagosou), *chebulic myrobalan* (kashi), *Polygonum tuber* (kashuu), *Curcuma rhizome* (gajutsu), *Pogostemon herb* (kakkou), kudzu vine root (kakkon), German chamomile flower, *Trichosanthes* root (karokon), *Trichosanthes kirilowii* (karonin), dried ginger (kankyou), licorice root (kanzou), common coltsfoot flower (kantouka), *Artemisia* leaf (gaiyou), *Platycodon* root (kikyou), *Hovenia dulcis* (kugishi), orange fruit (kikoku), immature orange fruit (kijitsu), *Chrysanthemum* flower (kikuka), dried tangerine peel (kippi), *Angelica koreanae radix* (kyoukatsu), apricot kernel (kyounin), kumquat (kinkan), Japanese honeysuckle (kinginka), *Desmodium styracifolium* (kinsensou), barberry wolfberry fruit (kukoshi), *Lycium* leaf (kukoyou), *Sophora* root (kujin), walnut (kurumi), *Melia azedarach* (kurenpi), *Lindera umbellata* (kuromoji), *Dianthus superbus* (kubaku), *Schizonepeta herb* (keigai), *Cassia bark* (keihi), *Cassia seed* (ketsumeishi), *Pharbitis seed* (kengoshi), figwort root (genjin), *Saccharum granorum* (kou), safflower (kouka), *Albizia julibrissin bark* (goukanpi), *Dalbergia odorifera* (koukou), *Glycine max* (koushi), crested latesummer mint (kouju), red ginseng (koujin), *Cyperus rhizome* (koubushi), non-glutinous rice (koubei), magnolia bark (kouboku), *Ligusticum sinense* root (kouhon), *Acanthopanax gracilis* (gokahi), *Achyranthes* root (goshitsu), *Euodia* fruit (goshuyu), Japanese knotweed (gojoukon), great burdock achene (goboushi), *Schisandra* fruit (gomishi), *Bupleurum* root (saiko), *Asiasari radix* (saishin), saffron, *Smilax rhizome* (sankirai), hawthorn fruit (sanzashi), *Gardenia* fruit (san-shishi), *Cornus* fruit (sanshuyu), Vietnamese *Sophora* root (sanzukon), jujube seed (sansounin), Japanese pepper (sanshou), *Scirpus fluvialis* (sanryou), *Dioscorea rhizome* (sanyaku), *Rehmannia* root (jiou), aster (shion), *Lycium bark* (jikoppi), *Lithospermum* root (shikon), *Perilla* fruit (shisoshi), *Perilla herb* (shisoyou), *Tribulus* fruit (shitsurishi), persimmon calyx (shitei), belvedere fruit (jifushi), peony root (shakuyaku), *Cnidium monnieri* fruit (jashoushi), *Codonopsis* root (shajin), plantain seed (shazenshi), plantain herb (shazensou), *Amomum seed* (shukusha), *Houttuynia herb* (juuyaku), ginger (shoukyou), hemp palm fruit (shurojitsu), hemp palm leaf (shuroyou), *Cimicifuga rhizome* (shouma), *Triticum fructus* (shoubaku), *Acorus calamus* (shoubukon), magnolia flower (shin'i), *Ligustrum* fruit (joteishi), *Fraxini bark* (shinpi), malted rice (shinkiku), *Gentiana macrophylla* root (jingyou), motherwort fruit (juuishi), *Zanthoxylum seed* (shokumoku), green tangerine peel (seih), *Acorus tatarinowii* (sekishoukon), pomegranate fruit peel (sekiryuujitsu), *Dendrobium herb* (sek-koku), Szechwan lovage rhizome (senkyuu), *Peucedanum praeruptorum* root (zenko), *Nuphar rhizome* (senkotsu), *Inula japonica* (senpukuka), *Sambucus williamsii* stem (sekkotsuboku), black cardamom (souka), *Gleditsia sinensis* (soukakushi), *Viscum stem* (soukisei), *Xanthium strumarium* (soujishi), *Atractylodes rhizome* (soujutsu), *Thuja orientalis* (sokuhakuyou), dipsaci root (zokudan), mulberry bark (souhakuhi), sappan wood (soboku), *Perilla* leaf (soyou), *Gleditsia sinensis* (soukyou), rhubarb (daiou), jujube (taisou), Areca peel (daifukuhi), *Alisma rhizome* (takusha), danshen herb (tanjin), bamboo cuhn (chikujo), *Panax rhizome* (chikusetsuninjin), *Phyllostachys nigra* leaf (chikuyou), *Anemarrhena rhizome* (chimo), garden burnet root (chiyu), clove (chouji), gambir plant (choutoukou), dried tangerine peel (chinpi),

Arisaematis rhizoma (tennanshou), Gastrodia tuber (tenma), Asparagi radix (tenmontou), Benincasa seed (tougashi), Japanese Angelica root (touki), castor oil plant (tougoma), Codonopsis root (toujin), common rush (toushinsou), peach seed (tounin), bitter orange peel (touhi), dodder seed (toshishi), Aesculus turbinata fruit (tochinomi), Eucommia bark (tochuu), Aralia rhizome (dokkatsu), Trichosanthes cucumeroides (dokakon), Cistanche herb (nikujuyou), nutmeg, *Lonicera japonica* (nindou), ginseng (ninjin), Fritillaria bulb (baimo), germinated barley (bakuga), *Platycladus orientalis* (hakushonin), white hyacinth bean (hakuhenzu), *Ophiopogonis* tuber (bakumontou), *Psoralea corylifoli* (hakoshi), mentha herb (hakka), peppermint (hakka), guava fruit (banka), *Pinellia* tuber (hange), *Agkistrodon* (hanbi), *Isatidis* root (ban-rankon), *Scutellaria barbata* (hanshiren), lily root (yurine), *Angelica dahurica* (byakushi), *Hedyotis diffusa* (byakukajazet-susou), Japanese stemona root (hyakubukon), *Atractylodes macrocephala* (byakujutsu), *Areca* seed (binrouji), *Sinomenium* stem (bouji), *Imperata* rhizome (boukon), *Saposhnikovia* root (boufuu), *Typha angustifolia* pollen (houou), *Taraxacum* root (houeikon), Moutan bark (botanpi), Ephedra herb (maou), hemp fruit (mashinin), *Vitex rotundifolia* fruit (mankeishi), pine resin (matsuyani), *Akebia* stem (mokutsuu), *Chaenomeles* fruit (mokka), *Saussurea* root (moukou), myrrh (motsuyaku), *Equisetum hyemale* (mokuzoku), *Belamcanda chinensis* (yakan), bitter cardamom (yakuchi), *Fallopia multiflora* (yakoutou), *Siraitia grosvenorii* (rakanka), *Eupatorium fortunei* (ransou), longan aril (ryuuganniku), Japanese gentian (ryuutan), *Alpinia officinarum* rhizome (ryoukyou), *Ganoderma lucidum* (reishi), *Forsythia* fruit (rengyou), *Glechoma hederacea* (rensensou), *Nelumbo* seed (renniku), and *Phragmites* rhizome (rokon).

[0076] According to yet another example, the ground plant is ground leaf tobacco. The ground leaf tobacco are particles obtained by grinding leaf tobacco (i.e., dried tobacco leaves used as a tobacco flavor source of a tobacco product). The ground leaf tobacco may have, for example, an average particle diameter of 0.1 μm to 120 μm . Herein, the average particle diameter is determined by a laser diffraction/scattering method, and refers to a value measured using a laser diffraction particle size distribution analyzer (e.g., LA-950 from Horiba, Ltd.).

[0077] According to yet another example, the ground plant is a mixture of vegetable powders such as herb powder, flower powder, spice powder, tea powder, cocoa powder, carob powder, coriander powder, licorice, orange peel powder, rose pip powder, chamomile flower powder, lemon verbena powder, peppermint powder, leaf powder, spearmint powder, and black tea powder, as well as mixed spices (e.g., five-spice powder, garam masala, ras el hanout, baligoule, chicken curry masala, tandoori masala, quatre epices, herbes de Provence), potpourri, and the like.

[0078] The plant-derived component may be an extract of the plant described above. The extract may be in the form of a liquid, a starch syrup, a powder, granules, a solution, or the like.

[0079] Examples of the plant-derived component include tamarind seed gum, guar gum, and locust bean gum, obtained from plant seeds. Examples of the plant-derived component include gum arabic and karaya gum, obtained from sap. Examples of the plant-derived component include pectin obtained from fruit. Examples of the plant-derived component also include cellulose, konjac mannan containing agarose as a main component (glucomannan), and soy polysaccharide, obtained from other parts of plants. The guar gum may be a cationized guar gum.

[0080] Examples of the plant-derived component include carrageenan (classified into 3 types: kappa carrageenan, iota carrageenan, lambda carrageenan), agar, and alginic acid, obtained from seaweed. The carrageenan may be a carrageenan metal salt and the alginic acid may be a salt such as sodium alginate.

[0081] Specific examples of the plant-derived component include tobacco extract, star anise oil, apple juice, vanilla extract, Peru balsam oil, beeswax absolute, cardamom oil, carob absolute, carrot juice, cassia bark oil, cedarwood oil, celery seed oil, chamomile oil, citronella oil, clary sage extract, coffee, cognac oil, coriander oil, davana oil, dill herb oil, fenugreek absolute, genet absolute, gentian root infusion, grape juice, guava extract, immortelle absolute, jasmine absolute, kola nut tincture, labdanum oil, terpeneless lemon oil, glycyrrhiza extract, maple syrup, mimosa absolute, molasses, nutmeg oil, orange flower oil, orange oil, orris root oil, peppermint oil, petitgrain Paraguay oil, plum extract, prune juice, raisin extract, rose oil, rum, sage oil, sandalwood oil, spearmint oil, styrax absolute, marigold oil, tea distillate, thyme oil, tomato extract, violet leaf absolute, mandarin oil, mint oil, and plant-derived starch.

[0082] For example, starch may be cornstarch (com), dogtooth violet starch (potato), sweet potato starch (sweet potato), tapioca starch (tapioca), or the like. They act as thickeners, stabilizers and the like. These starches are capable of improving the acid resistance, improving the heat resistance, improving the shear resistance, and the like by crosslinking. Furthermore, it is possible to improve storage stability and promote gelatinization by esterification or etherification. Furthermore, it is possible to improve transparency, storage stability and the like by oxidation.

[0083] The plant-derived component is preferably a tobacco extract.

[0084] The lipid is, for example, fatty acid or fatty acid ester.

[0085] When the flavorant composition further contains a fatty acid, irritation to the throat during use of the flavor inhalation article is likely to be suppressed. Also, when the flavorant composition further contains a fatty acid, the low HLB emulsifier emulsifies the fatty acid, and therefore, a greater amount of fatty acid can be blended into the flavorant composition as compared to a flavorant composition with no emulsifier.

[0086] The fatty acid is preferably a saturated fatty acid. Furthermore, the fatty acid is preferably a higher fatty acid. Herein, a higher fatty acid is a fatty acid having 13 or more carbon atoms in one molecule.

[0087] Specific examples of fatty acids include a palmitic acid, a stearic acid and a myristic acid. The fatty acid is

preferably a palmitic acid. The fatty acid may be an unsaturated fatty acid. The fatty acid may be either a single kind or two or more kinds. The fatty acid may be a natural fat including a plurality of fatty acids such as palm oil.

[0088] The mass of the fatty acid relative to the mass of the emulsifier is, for example, preferably in the range of 0.1 to 100.0, more preferably in the range of 1.0 to 10.0.

[0089] The fatty acid ester is, for example, medium-chain fatty acid ester. The medium-chain fatty acid ester is, for example, medium-chain fatty acid triglyceride, medium-chain fatty acid diglyceride, or medium-chain fatty acid monoglyceride. The medium-chain fatty acid is, for example, caprylic acid, capric acid, or lauric acid having 8 to 12 carbon atoms. Specific examples of the medium-chain fatty acid ester include glyceryl tri(caprylate/caprate) or glyceryl trilaurate. The medium-chain fatty acid ester has, for example, a role of controlling release of another flavorant. The medium-chain fatty acid can also be used to adjust the viscosity of the flavorant composition.

[0090] The flavorant may be either a single kind or two or more kinds.

[0091] The ratio M1/M2 between the mass M1 of the emulsifier and the mass M2 of the flavorant is preferably in the range 0.001 to 20.0, preferably in the range 0.01 to 2.

[0092] The flavorant composition may further contain a solvent. The solvent is a solvent or dispersion medium for the flavorant. If the flavorant composition further contains a solvent, the compatibility with the tobacco constituent member is further improved, and thus the tobacco constituent member is easily carried with the flavorant composition.

[0093] The solvent preferably includes monohydric alcohol. The monohydric alcohol is, for example, ethanol, a monohydric alcohol such as benzyl alcohol, or the like.

[0094] The mass of the solvent relative to the mass of the emulsifier is preferably in the range of 0.0 to 100, more preferably in the range of 0.1 to 20.

[0095] The flavorant composition may further contain a glucan. The glucan is preferably an amphipathic glucan. The amphipathic glucan has an affinity for both hydrophobic and hydrophilic flavorants. The glucan is preferably soluble in an organic solvent. The glucan is preferably a cellulose derivative, more preferably a cellulose derivative soluble in an organic solvent. Here, the cellulose derivative refers to a derivative obtained by introducing a substituent into the OH group of cellulose, and examples include ethyl cellulose, hydroxypropyl cellulose, and hydroxypropyl methylcellulose (e.g., hydrophobically-modified hydroxypropyl methylcellulose). The cellulose derivative is widely used in general as a binder, a film-forming agent, and a gelling agent, with the complex effects brought about by its characteristic functional group. Here, the organic solvent as in the expression "soluble in an organic solvent..." is, for example, ethanol.

[0096] The cellulose derivative is preferably an amphipathic cellulose derivative, and more preferably hydroxypropyl cellulose. The substitution degree of hydroxypropyl cellulose is, for example, 0.1 to 4.5, preferably 2.0 to 4.5. Herein, the substitution degree of hydroxypropyl cellulose represents the number of hydroxypropyl groups per glucose. As the hydroxypropyl cellulose, a commercially available product under the trade name of, for example, CELNY from Nippon Soda Co., Ltd. can be used.

[0097] Advantages obtained when the flavorant composition further contains hydroxypropyl cellulose will be described below. Hydroxypropyl cellulose is a derivative of cellulose, and is a substance obtained by substituting the OH groups of cellulose with hydroxypropyl groups. Hydroxypropyl cellulose is widely used as a binder, a film-forming agent, and a gelling agent. Cellulose is a hydrophobic substance, since OH groups are hydrogen-bonded between molecules to crystallize. On the other hand, hydroxypropyl cellulose has hydroxypropyl groups, which make it difficult to form hydrogen bonds between molecules, and is therefore a substance having both hydrophilicity and hydrophobicity (i.e., an amphipathic substance).

[0098] It has been reported that, in a system including glycerin, hydroxypropyl cellulose forms a complex with a network structure through an interaction (hydrogen bond) between the hydroxypropyl groups of the hydroxypropyl cellulose and the OH groups of glycerin. Further, since hydroxypropyl cellulose has amphipathicity, it is considered that a hydrophilic flavorant and a hydrophobic flavorant can be incorporated into the network structure. It is considered that such a complex with a network structure allows the flavorant to be stably carried without being volatilized during storage of the tobacco product, and to be stably released during the use of the tobacco product (in particular, during heating of the flavor inhalation article). Moreover, when the flavorant composition further contains hydroxypropyl cellulose, the viscosity adjustment of the flavorant composition is excellent. The network structure formed by hydroxypropyl cellulose is smaller than the network structure formed by the low HLB emulsifier. According to one example, the network structure formed by the hydroxypropyl cellulose is located within the network of the network structure formed by the low HLB emulsifier. The network structure formed by the low HLB emulsifier will be described later. Hydroxypropyl cellulose is soluble in an organic solvent, in particular, ethanol.

[0099] The flavorant composition may further contain a coloring agent, a wetting agent, or a preservative.

[0100] Examples of the coloring agent include natural dyes and synthetic dyes. Examples of the natural dyes include caramel, turmeric, monascus, gardenia, safflower, carotene, marigold, and annatto. Examples of the synthetic dyes include a tar dye and titanium oxide.

[0101] Examples of the wetting agent include a lipid such as wax.

[0102] Examples of the preservative include benzoic acid, propionic acid, sorbic acid, and salts thereof, and nisin.

[0103] For example, at 20°C, the flavorant composition is non-fluid. According to one example, the flavorant composition is solidified. Alternatively, the flavorant composition has a sufficiently high viscosity.

[0104] When the flavorant composition has a sufficiently high viscosity at 20°C, the viscosity of the flavorant composition is preferably 4000 mPa·s or more, more preferably 6000 mPa·s or more. When the flavorant composition has a sufficiently high viscosity, the flavorant composition is less likely to exude to the base member. The viscosity can be measured using, for example, a tuning fork vibration viscometer. There is no upper limit to the viscosity of the flavorant composition, but the upper limit is, for example, 15000 mPa·s or less.

[0105] The freezing point of the flavorant composition is, for example, in the range of 20°C to 100°C.

[0106] For example, when the flavorant composition is applied to the above-described filter material, it is preferable that the flavorant composition further contain an adsorbent. The adsorbent is, for example, a porous body such as activated carbon.

[0107] The flavorant composition may be present in the form of a coating on the surface of the base member so as to cover the entire surface of the base member, or may be present on the base member so as to cover part of the surface of the base member. The flavorant composition may be locally present on the surface of the base member (i.e., may be present only on the surface of the base member and may not permeate the base member), or all of the flavorant composition may not necessarily be present on the surface of the base member, with part of the flavorant composition permeating the base member. For example, when an aggregate of cut pieces of sheet tobacco is used as the base member, the flavorant composition may be present in gaps of the aggregate.

<2. Method of Producing Flavorant-Carrying Constituent Member>

[0108] The above-described flavorant-carrying constituent member can be produced, for example, by the following method.

[0109] First, a mixture containing a low HLB emulsifier and a flavorant is prepared.

[0110] Next, the mixture is heated and stirred. The heating is performed, for example, in a range of 40°C to 100°C.

[0111] The flavorant composition is obtained as explained above.

[0112] Next, the resulting flavorant composition is applied to a constituent member of a tobacco product.

[0113] The "constituent member of the tobacco product" has been discussed in the section "1. Flavorant-Carrying Constituent Member", and will also be referred to as a "base member" in the description that follows.

[0114] The method of applying the flavorant composition to the base member is not particularly limited. For example, the flavorant composition may be added onto or coated on the surface of the base member, the flavorant composition may be sprayed onto the surface of the base member, the base member may be immersed in the flavorant composition, or the flavorant composition may be directly injected into the portion of the base member in a tobacco rod via an injector, etc. When the flavorant composition is directly injected into the portion of the base member in a tobacco rod via an injector, etc., for example, the flavorant composition may be directly injected into holes of a tobacco filler 111 described later. Alternatively, the flavorant composition may be directly injected into the tobacco filler 111 without providing the holes described above.

[0115] Approaches that can be adopted in applying the flavorant composition to cut tobacco include: directly adding the flavorant composition to a surface of the cut tobacco via a transfer pump; spraying the flavorant composition on the cut tobacco with a nozzle atomizer; or directly injecting the flavorant composition into the portion of the cut tobacco in a tobacco rod via an injector, etc. Alternatively, the application of the flavorant composition to cut tobacco may be performed by immersing the cut tobacco in the flavorant composition.

[0116] Approaches that can be adopted in applying the flavorant composition to sheet tobacco include: extruding the flavorant composition onto a surface of the sheet tobacco with a slit feeder; and coating the flavorant composition with a film applicator, etc. Alternatively, approaches such as spraying and immersing can also be adopted, in accordance with the same approach that can be adopted in the application to cut tobacco. When sheet tobacco is cut, it is preferable to follow the same approach as that in the application to cut tobacco.

[0117] Approaches that can be adopted in applying the flavorant composition to cigarette paper include: extruding the flavorant composition with a slit feeder; and coating the flavorant composition with a film applicator, etc., as described above. Alternatively, approaches such as spraying and immersing can also be adopted, in accordance with the same approach that can be adopted in the application to cut tobacco.

[0118] A granule coating technique can be used in applying the flavorant composition to tobacco granules. For example, approaches such as directly adding the flavorant composition to surfaces of the tobacco granules can be adopted, in accordance with the same approach that can be adopted in the application to cut tobacco.

[0119] Approaches that can be adopted in applying the flavorant composition to a filter material such as cellulose acetate fibers include extruding the flavorant composition with a slit feeder and coating the flavorant composition with a film applicator, in accordance with the same approach that can be adopted in the application to cut tobacco. Alternatively, approaches such as spraying and immersing can be adopted, in accordance with the same approach that can be adopted

in the application to cut tobacco.

[0120] Approaches that can be adopted in applying the flavorant composition to a filter material such as paper or a film include coating the flavorant composition with a film applicator, etc., for example, in accordance with the same approach that can be adopted in the application to sheet tobacco. Alternatively, approaches such as spraying and immersing can also be adopted, in accordance with the same approach that can be adopted in the application to cut tobacco.

[0121] The application amount of the flavorant composition can be suitably determined so that the flavorant-carrying constituent member can provide a flavorant, depending on the composition (i.e., the type and amount of the blended components) of the flavorant composition, the type of the base member, etc.

[0122] When the flavorant composition is directly injected into the base member, for example, an aggregate of cut pieces of sheet tobacco via an injector or the like, the application amount of the flavorant composition is preferably in the range of 1.0 parts by mass to 50.0 parts by mass with respect to 100 parts by mass of the aggregate of cut pieces of sheet tobacco.

[0123] When the flavorant composition is applied to a filter material, the application amount of the flavorant composition is preferably in the range of 1.0 to 80.0 parts by mass with respect to 100 parts by mass of the filter material.

[0124] The flavorant-carrying constituent member of the tobacco product is obtained as explained above.

[0125] According to the method of producing the flavorant-carrying constituent member described above, it is possible to produce a flavorant-carrying constituent member without undergoing a drying step. That is, it is possible to produce a flavorant-carrying constituent member without undergoing a heat drying step or a reduced-pressure drying step. Therefore, when the flavorant composition contains a volatile component, volatilization of the volatile component is suppressed. Here, the heat drying step is a step performed, for example, in a range of 40°C to 200°C.

[0126] According to another aspect, there is provided a flavorant-carrying constituent member obtainable by the method described above. According to yet another aspect, there is provided a method of producing a tobacco product, including producing a tobacco product by using a flavorant-carrying constituent member obtainable by the above-described method.

<3. Tobacco Product>

[0127] The above-described "flavorant-carrying constituent member", e.g., the flavorant-carrying tobacco filler, flavorant-carrying cigarette paper, flavorant-carrying base material, etc., can be incorporated into a tobacco product. Specifically, when the tobacco product is a flavor inhalation article, at least one of the flavorant-carrying tobacco filler, the flavorant-carrying cigarette paper, the flavorant-carrying filter, the flavorant-carrying paper tube or the flavorant-carrying base material can be incorporated into the flavor inhalation article. That is, according to another aspect, there is provided a tobacco product including the "flavorant-carrying constituent member" described above.

[0128] The tobacco product of the present invention has the same configuration as that of an ordinary tobacco product, except that a constituent member of the ordinary tobacco product is replaced with the flavorant-carrying constituent member of the present invention. In a specific embodiment, the tobacco product of the present invention may include at least one selected from the above-described "flavorant-carrying cut tobacco", the above-described "flavorant-carrying sheet tobacco", the above-described "flavorant-carrying tobacco granules", the above-described "flavorant-carrying filter", the above-described "flavorant-carrying paper tube", the above-described "flavorant-carrying base material", and the above-described "flavorant-carrying cigarette paper". The tobacco product of the present invention may include the above-described "flavorant-carrying constituent member" in combination. For example, the above-described "flavorant-carrying cut tobacco" and the above-described "flavorant-carrying sheet tobacco" may be included in combination, or the above-described "flavorant-carrying cut tobacco" and the above-described "flavorant-carrying cigarette paper" may be included in combination.

[0129] The flavorant-carrying constituent member may be blended into the tobacco product in any amount. The flavorant-carrying constituent member may be used in combination with a constituent member not carried with a flavorant, or may be used alone, not in combination with a constituent member not carried with a flavorant. The flavorant-carrying cut tobacco, the flavorant-carrying sheet tobacco, the flavorant-carrying tobacco granules, the flavorant-carrying filter, the flavorant-carrying paper tube, and the flavorant-carrying base material can be blended in an amount of, for example, 0.1 to 100% by mass with respect to the entire tobacco product, assuming that a single tobacco product is 100% by mass.

[0130] According to one embodiment, the above-described "flavorant-carrying constituent member" can be incorporated into a combustion-type flavor inhalation article or a heating-type flavor inhalation article. That is, according to a preferred embodiment, a combustion-type flavor inhalation article or a heating-type flavor inhalation article including the above-described "flavorant-carrying constituent member" is provided. The combustion-type flavor inhalation article is a flavor inhalation article which provides the user with the flavor by combusting the flavor source, as described above. Also, the heating-type flavor inhalation article is a flavor inhalation article which provides the user with the flavor by heating, not combusting, the flavor source.

[0131] Examples of the combustion-type flavor inhalation article include a cigarette, a pipe, a kiseru (i.e., traditional

Japanese pipe for fine cut tobacco), a cigar, and a cigarillo.

[0132] An example of the heating-type flavor inhalation article will be described below.

[0133] FIG. 1 is a schematic view schematically showing a heating-type flavor inhalation article 1 according to an embodiment of the present invention. The heating-type flavor inhalation article 1 shown in FIG. 1 includes a flavorant-carrying tobacco filler.

[0134] The heating-type flavor inhalation article 1 (hereinafter simply referred to as "flavor inhalation article 1") has a cylindrical shape. The circumference of the flavor inhalation article 1 is preferably 16 mm to 27 mm, more preferably 20 mm to 26 mm, and even more preferably 21 mm to 25 mm. A full length (horizontal length) of the flavor inhalation article 1 is not particularly limited, but is preferably 40 mm to 90 mm, more preferably 50 mm to 75 mm, and even more preferably 50 mm to 60 mm.

[0135] The flavor inhalation article 1 includes a tobacco-containing segment 11, a filter part 12 configuring a mouthpiece, a connecting part 13 connecting the tobacco-containing segment 11 and the filter part 12, and a lining paper 14. These will be described below with reference to FIG. 2.

[0136] FIG. 2 is a cross-sectional view schematically showing the flavor inhalation article 1 shown in FIG. 1.

[0137] The tobacco-containing segment 11 has a cylindrical shape. A full length (axial length) of the tobacco-containing segment 11 is, for example, preferably 20 to 70 mm, more preferably 20 to 50 mm, and even more preferably 20 to 30 mm. A cross-sectional shape of the tobacco-containing segment 11 is not particularly limited, but may be, for example, a circle, an ellipse, or a polygon.

[0138] The tobacco-containing segment 11 includes a tobacco filler 111, and cigarette paper 112 wrapped around the tobacco filler 111, and a flavorant composition 113.

[0139] The tobacco filler 111 is, for example, an aggregate of cut pieces of sheet tobacco. The tobacco filler 111 is a columnar body. For example, as shown in FIG. 1, the tobacco filler 111 has a cylindrical shape. The tobacco filler 111 has a hole extending from one bottom surface to the other bottom surface. In FIG. 2, the hole is a through hole.

[0140] The tobacco filler 111 may contain an aerosol-generating substrate. Examples of the aerosol-generating substrate include glycerin, propylene glycol (PG), triethyl citrate (TEC), triacetin, and 1,3-butanediol. These may be used either alone or in combination of two or more.

[0141] The cigarette paper 112 is paper for wrapping the tobacco filler 111 in a flavor inhalation article.

[0142] The flavorant composition 113 is located within the hole of the tobacco filler 111. The flavorant composition 113 is primarily located within the hole, but may diffuse to areas in the vicinity of the hole or throughout the tobacco filler 111.

[0143] The filter part 12 has a cylindrical shape. The filter part 12 includes a rod-shaped first segment 121, a rod-shaped second segment 122, and an outer plug wrapper 123.

[0144] The first segment 121 is located on the side of the tobacco-containing segment 11. The first segment 121 has a through hole extending from one bottom surface to the other bottom surface. The second segment 122 is located on the side of the mouthpiece. The second segment 122 is solid. The first segment 121 is configured of a first filled body (cellulose acetate fibers) 1211 and an inner plug wrapper 1212 wrapped around the first filled body 1211. The second segment 122 is configured of a second filled body (cellulose acetate fibers) 1221 and an inner plug wrapper 1222 wrapped around the second filled body 1221.

[0145] The outer plug wrapper 123 connects the first segment 121 and the second segment 122. The outer plug wrapper 123 is adhered to the first segment 121 and the second segment 122 with a vinyl acetate emulsion-based adhesive, etc.

[0146] The length of the filter part 12 may be, for example, 10 to 30 mm, the length of the connecting part 13 may be, for example, 10 to 30 mm, the length of the first segment 121 may be, for example, 5 to 15 mm, and the length of the second segment 122 may be, for example, 5 to 15 mm. The lengths of these individual segments are an example, and may be suitably varied according to the production suitability, the required quality, the length of the tobacco-containing segment 11, etc.

[0147] For example, the first segment 121 (center hole segment) is configured of the first filled body 1211 having one or more through holes, and the inner plug wrapper 1212 that covers the first filled body 1211. The first segment 121 has a function of increasing the strength of the second segment 122. The first filled body 1211 of the first segment 121 is a filled body filled with, for example, cellulose acetate fibers at a high density. The cellulose acetate fibers are cured through addition of, for example, 6 to 20% by mass of a triacetin-containing plasticizer relative to the mass of cellulose acetate. The through hole of the first segment 121 has an inner diameter of, for example, ϕ 1.0 to ϕ 5.0 mm.

[0148] The fiber filling density of the first filled body 1211 of the first segment 121 may be configured, for example, to be relatively high, or may be equivalent to the fiber filling density of the second filled body 1221 of the second segment 122 to be described below. Therefore, at the time of inhalation, air or aerosol flows only through the through hole, and almost no air or aerosol flows through the first filled body 1211. When it is desired, for example, to reduce a decrease in the aerosol components due to filtration in the second segment 122, the length of the second segment 122 may be shortened and the first segment 121 may be lengthened accordingly.

[0149] Replacing the shortened second segment 122 with the first segment 121 is effective in increasing the delivery

amount of the aerosol components. Since the first filled body 1211 of the first segment 121 is a fiber filled body, the feeling of touch from the outside during use does not cause discomfort to the user.

[0150] The second segment 122 is configured of the second filled body 1221 and the inner plug wrapper 1222 that covers the second filled body 1221. The second filled body 1221 of the second segment 122 is a filled body filled with, for example, cellulose acetate fibers. The second segment 122 (filter segment) is filled with cellulose acetate fibers at a general density, and has filtration properties of general aerosol components.

[0151] The first segment 121 and the second segment 122 may have different filtration properties for filtering aerosol (mainstream smoke) released from the tobacco-containing segment 11. At least one of the first segment 121 or the second segment 122 may contain a flavorant. The filter part 12 may take any structure, which may be a structure including a plurality of segments as described above, or may be configured of a single segment.

[0152] The connecting part 13 has a cylindrical shape. The connecting part 13 has a paper tube 131 formed in a cylindrical shape using, for example, thick paper.

[0153] As described above, the lining paper 14 is wrapped in a cylindrical shape around the outside of the tobacco-containing segment 11, the connecting part 13, and the filter part 12 so as to connect them integrally. A vinyl acetate emulsion-based adhesive is applied onto the entire surface or substantially the entire surface of one surface (inner surface) of the lining paper 14 except in the vicinity of ventilation opening parts 141. The ventilation opening parts 141 are formed by laser processing from outside, after the tobacco-containing segment 11, the connecting part 13, and the filter part 12 are integrally formed by the lining paper 14.

[0154] The ventilation opening part 141 has two or more through holes that penetrate the connecting part 13 in a thickness direction. The two or more through holes are formed so as to be arranged radially when viewed from an extension of the central axis of the flavor inhalation article 1. In the present embodiment, the ventilation opening part 141 is provided in the connecting part 13, but may be provided in the filter part 12. In the present embodiment, two or more through holes of the ventilation opening part 141 are provided side by side in a single row at regular intervals on one ring; however, they may be provided side by side in two rows at regular intervals on two rings, or one or two rows of the ventilation opening part 141 may be provided side by side in a discontinuous or irregular manner. When the user holds a mouthpiece to inhale, the outside air is taken into the mainstream smoke via the ventilation opening part 141.

[0155] The first segment 121 may be omitted. If the first segment 121 is omitted, the length of the second segment 122 may be equal to the length of the filter part 12. In this case, a seamless capsule containing a flavorant may be provided in the second filled body 1221.

[0156] The above-described hole of the tobacco filler 111 may be omitted. In this case, the flavorant composition is located, for example, in gaps of the tobacco filler 111.

[0157] Although the above-described flavor inhalation article 1 includes the flavorant-carrying tobacco filler, the above-described flavorant-carrying filter or the above-described flavorant-carrying paper tube may be provided instead of the flavorant-carrying tobacco filler. According to one example, the flavorant-carrying filter includes the first filled body 1211, and the flavorant composition carried on a sidewall of the through hole of the first filled body 1211. According to another example, the flavorant-carrying filter includes the second filled body 1221 and the flavorant composition carried on the second filled body 1221. The flavorant-carrying paper tube includes, for example, a paper tube 131 and a flavorant composition carried on an inner surface of the paper tube 131.

[0158] An example of the heating-type flavor inhalation article has been described above.

[0159] The above-described flavor inhalation article 1 may be heated by a heating device separate from the article, or may be heated by a heating device integrated with the article. Herein, the heating-type flavor inhalation article and the heating device in the former flavor inhalation article (separate type) are collectively referred to as a "heating-type smoking system".

[0160] An example of the heating-type smoking system will be described below with reference to FIGS. 3 and 4.

[0161] FIGS. 3 and 4 are schematic cross-sectional views showing an example of the heating-type smoking system. FIG. 3 shows a state before the above-described flavor inhalation article 1 is inserted into a heating device 2, and FIG. 4 shows a state in which the above-described flavor inhalation article 1 is inserted into the heating device 2 and heated.

[0162] As shown in FIGS. 3 and 4, the heating-type smoking system includes the flavor inhalation article 1, and the heating device 2 which heats the tobacco-containing segment 11 of the flavor inhalation article 1 from outside. The heating-type smoking system is not limited to the configuration of FIGS. 3 and 4, provided that a flavor inhalation article 1 and a heating device 2 for heating the flavor inhalation article 1 are provided.

[0163] The heating device 2 shown in FIGS. 3 and 4 includes a body 21, a heater 22, a metal tube 23, a battery unit 24, and a control unit 25. The body 21 includes a tubular recess 211, and the heater 22 and the metal tube 23 are arranged on an inner side surface of the recess 211 at a position corresponding to the tobacco-containing segment 11 of the flavor inhalation article 1 inserted into the recess 211. The body 21 further includes a ventilation hole 212, and the ventilation hole 212 allows the outside of the body 21 to communicate with the recess 211 to supply air to the flavor inhalation article 1 put into the recess 211.

[0164] The heater 22 may be an electrical resistance-based heater, and heating of the heater 22 is performed through

electric power supplied from the battery unit 24 in accordance with an instruction from the control unit 25 that performs temperature control.

[0165] The heat generated from the heater 22 is conveyed to the tobacco-containing segment 11 of the flavor inhalation article 1 through the metal tube 23 having a high thermal conductivity.

[0166] Since a schematic view is shown in FIG. 4, a gap appears to exist between an outer periphery of the flavor inhalation article 1 and an inner periphery of the metal tube 23; in actuality, however, it is desirable that a gap between the outer periphery of the flavor inhalation article 1 and the inner periphery of the metal tube 23 be absent for the purpose of efficient heat transfer.

[0167] The heating device 2 heats the tobacco-containing segment 11 of the flavor inhalation article 1 from the outside, but may heat it from the inside.

[0168] The heating temperature of the heating device 2 is not particularly limited, but is preferably 400°C or lower, more preferably 150°C or higher and 400°C or lower, and even more preferably 200°C or higher and 350°C or lower. The heating temperature refers to a temperature of the heater 22 of the heating device 2. The heating-type smoking system has been described.

[0169] An example of the combustion-type flavor inhalation article will be described below.

[0170] The combustion-type flavor inhalation article 3 shown in FIG. 5 includes a tobacco rod 31, a filter 32 including a filter material 321 and a plug wrapper 322 wrapped around the filter material 321, and tipping paper 33 wrapped on the tobacco rod 31 and the filter 32 so as to connect the tobacco rod 31 and the filter 32.

[0171] The tobacco rod 31 includes a tobacco filler 311, cigarette paper 312 wrapped around the tobacco filler 311, and a flavorant composition 313. The tobacco filler 311 is, for example, an aggregate of cut pieces of sheet tobacco. The tobacco filler 311 has a cylindrical shape. The tobacco filler 311 has a hole extending from one bottom surface to the other bottom surface, as in the tobacco filler 311 described above. The flavorant composition 313 is located within the hole of the tobacco filler 311. The flavorant composition 113 is primarily located within the hole, but may diffuse to areas in the vicinity of the hole or throughout the tobacco filler 111. The tobacco rod 31 may have, for example, a diameter of 5 to 10 mm and a length of 40 to 80 mm, as in an ordinary cigarette.

[0172] The filter 32 is a filter made of a single filter material 321, that is, a so-called plane filter. The filter material 321 may be made of a filter material such as acetate tow as in an ordinary cigarette. The diameter of the filter 32 is substantially the same as that of the tobacco rod 31, and the length may be, for example, 15 to 40 mm as in an ordinary cigarette. The plug wrapper 322 may have a thickness of 10 to 100 μm , and may or may not have ventilation, but generally uses paper having ventilation.

[0173] The tipping paper 33 is bonded with an adhesive so as to cover the entire plug wrapper 322 and a part of the cigarette paper 312. The tipping paper 33 may have, for example, a length (width) of 20 to 50 mm in the axial direction of the tobacco rod 31, and a thickness of 10 to 100 μm . As in an ordinary cigarette, the tipping paper 33 may be provided with a single row or a plurality of rows of small holes for ventilation (ventilation holes) along the circumferential direction of the cigarette, or may be provided with a large number of small openings irregularly.

[0174] The combustion-type flavor inhalation article 3 has been described above.

<Effects>

[0175] Meanwhile, a flavorant composition that is the same as the above-described flavorant composition except for not containing a low HLB emulsifier (hereinafter referred to as a flavorant composition according to a comparative example) has fluidity. Therefore, when the flavorant composition according to the comparative example is applied to a constituent member of a tobacco product, the flavorant composition easily exudes to the constituent member.

[0176] On the other hand, the above-described flavorant composition contains a low HLB emulsifier, and is therefore non-fluid at room temperature, e.g., 22°C. Therefore, when the above-described flavorant composition is applied to a constituent member of a tobacco product, the flavorant composition, specifically, a liquid component of the flavorant composition, does not easily exude to the constituent member. The present inventors consider that one of the reasons why the flavorant composition is non-fluid is as follows. The low HLB emulsifier forms a network structure in the flavorant composition. It is considered that the network structure has relatively large networks, e.g., networks having a maximum diameter of a few μm , and that the components of the flavorant composition other than the low HLB emulsifier are retained within the network. For this reason, the above-described flavorant composition is non-fluid and does not easily exude to the constituent member of the tobacco product.

[0177] Furthermore, the present inventors have found that, for the flavor inhalation article containing the flavorant composition according to the comparative example, the release amount of the flavorant may decrease according to the number of puffs during inhalation. It is considered that one of the reasons for the decrease in the release amount of the flavorant is as follows. When the flavorant composition has fluidity, the flavorant composition spreads on the constituent member of the tobacco product and has a large contact area with a fluid such as air. Accordingly, the flavorant contained in the flavorant composition is easily released into a fluid such as air. Therefore, most of the flavorant is released at a

stage where the number of puffs is small. Therefore, the release amount of the flavorant decreases according to the number of puffs.

[0178] On the other hand, for the flavor inhalation article containing the above-described flavorant composition, the release amount of the flavorant according to the number of puffs does not easily decrease during inhalation. That is, for the flavor inhalation article containing the above-described flavorant composition, the change in the release amount of the flavorant according to the number of puffs is small. It is considered that one of the reasons for the small change in the release amount of the flavorant is as follows. The above-described flavorant composition is non-fluid. Therefore, the above-described flavorant composition does not spread on the constituent member of the tobacco product and has a small contact area with a fluid such as air, as compared with the flavorant composition according to the comparative example. Furthermore, for the above-described flavorant composition, the flavorant is retained in the above-described network structure. For these reasons, the flavorant contained in the above-described flavorant composition is less likely to be released into a fluid such as air as compared with the flavorant composition according to the comparative example. Therefore, for the flavor inhalation article containing the above-described flavorant composition, the change in the release amount of the flavorant according to the number of puffs is small.

[0179] Technical matters related to the above-described matters will be summarized below. One or more of the matters described in the above embodiments can be combined with the following matters.

[0180] According to a technical matter, there is provided a flavorant-carrying constituent member including:

a constituent member of a tobacco product; and

a flavorant composition carried on the constituent member and containing an emulsifier and a flavorant, the emulsifier having an HLB in a range of 1 to 7.

[0181] According to another technical matter, there is provided the flavorant-carrying constituent member according to the above-described technical matter, wherein a ratio M1/M2 between a mass M1 of the emulsifier and a mass M2 of the flavorant is 0.001 to 20.0.

[0182] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the flavorant composition further contains a solvent.

[0183] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to the above-described technical matter, wherein the solvent includes a monohydric alcohol.

[0184] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the solvent includes ethanol.

[0185] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein a mass of the solvent relative to the mass of the emulsifier is in a range of 0.0 to 100, preferably in a range of 0.1 to 20.

[0186] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the emulsifier has an HLB in a range of 2 to 5.

[0187] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the HLB is measured by a Griffin method.

[0188] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the emulsifier includes one or more selected from the group consisting of glycerin fatty acid ester, poly glycerin fatty acid ester, propylene glycol fatty acid ester, sucrose fatty acid ester, sorbitan fatty acid ester, lecithin, and organic acid monoglyceride.

[0189] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the emulsifier includes one or more selected from the group consisting of glycerin fatty acid ester, poly glycerin fatty acid ester, propylene glycol fatty acid ester, sucrose fatty acid ester, sorbitan fatty acid ester, and lecithin.

[0190] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the emulsifier includes one or more selected from the group consisting of glycerin fatty acid ester, poly glycerin fatty acid ester, and propylene glycol fatty acid ester.

[0191] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the emulsifier includes at least one of glycerin fatty acid ester or polyglycerin fatty acid ester.

[0192] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the emulsifier includes glycerin fatty acid ester, and the glycerin fatty acid ester is monoglyceride.

[0193] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the emulsifier includes one or more selected from the group consisting of glyceryl monobehenate, decaglyceryl pentastearate, and propylene glycol monostearate.

[0194] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the emulsifier includes glyceryl monobenhenate.

[0195] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the emulsifier includes decaglyceryl pentastearate.

[0196] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the emulsifier includes propylene glycol monostearate.

[0197] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the flavorant includes one or more selected from the group consisting of a flavor-presenting material, a taste-presenting material, a plant material, a lipid, and nicotine.

[0198] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the flavorant includes a flavor-presenting material.

[0199] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the flavorant includes a polyol.

[0200] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the flavorant includes a lipid.

[0201] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the lipid includes at least one of fatty acid ester or fatty acid.

[0202] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the fatty acid ester includes a medium-chain fatty acid ester, and the medium-chain fatty acid ester includes one or more selected from the group consisting of a medium-chain fatty acid triglyceride, a medium-chain fatty acid diglyceride, and a medium-chain fatty acid monoglyceride.

[0203] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the fatty acid includes one or more selected from the group consisting of palmitic acid, stearic acid, and myristic acid.

[0204] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the flavorant includes at least one of a polyol or menthol.

[0205] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the flavorant includes a combination of propylene glycol and menthol, or menthol.

[0206] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the flavorant includes a combination of propylene glycol and menthol, and a ratio of a mass of menthol to a mass of propylene glycol is preferably in a range of 0.01 to 100, more preferably in a range of 0.1 to 10.

[0207] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the flavorant includes propylene glycol, menthol, and glyceryl tri(caprylate/caprate).

[0208] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the flavorant composition further contains glucan.

[0209] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the glucan is a cellulose derivative.

[0210] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the glucan is amphipathic.

[0211] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the flavorant composition further contains hydroxypropyl cellulose.

[0212] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the flavorant composition further contains an adsorbent.

[0213] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the flavorant composition is solidified at 20°C.

[0214] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein a viscosity of the flavorant composition at 20°C is preferably 4000 mPa·s or more, more 6000 mPa·s or more.

[0215] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the constituent member is a tobacco filler.

[0216] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the constituent member is an aggregate of cut pieces of sheet tobacco.

[0217] According to yet another technical matter, there is provided the flavorant-carrying constituent member according

to any of the above-described technical matters, wherein the constituent member is a filter.

[0218] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the constituent member is a tube.

[0219] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the constituent member is paper.

[0220] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the constituent member is a base material of a flavorant filler or cut pieces of the base material.

[0221] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the tobacco product is a heating-type flavor inhalation article.

[0222] According to yet another technical matter, there is provided the flavorant-carrying constituent member according to any of the above-described technical matters, wherein the tobacco product is a combustion-type flavor inhalation article.

[0223] According to yet another technical matter, there is provided a method of producing a flavorant-carrying constituent member of a tobacco product including carrying, on a constituent member of a tobacco product, a flavorant composition containing an emulsifier and a flavorant, the emulsifier having an HLB in a range of 1 to 7.

[Examples]

[0224] Examples according to the present invention and Comparative Examples are described below.

<Preparation of Flavorant Composition>

<Example 1-1>

[0225] First, a mixture of 20 parts by mass of menthol, 60 parts by mass of ethanol, 15 parts by mass of hydroxypropyl cellulose, and 5 parts by mass of a low HLB emulsifier was prepared. As the hydroxypropyl cellulose, "CELNY SSL" (available from Nippon Soda Co., Ltd.) was used. "CELNY SSL" has a degree of substitution of approximately 3.5 per glucose. As the low HLB emulsifier, "POEM® B-100" (available from Riken Vitamin Co., Ltd.) was used. The main component of "POEM® B-100" is glyceride monobehenate. The HLB of "POEM® B-100" is 4.2.

[0226] The mixture was then heated and stirred.

[0227] The flavorant composition was obtained as explained above.

<Examples 1-2 to 1-9 and Comparative Examples 1-1 to 1-5>

[0228] The flavorant compositions according to Examples 1-2 to 1-9 and Comparative Examples 1-1 to 1-5 were prepared in the same manner as described for Example 1-1 except that the compositions were changed as shown in Tables 1 and 2.

[Table 1]

[0229]

Table 1

	Example						Compar. Example
	1-1	1-2	1-3	1-4	1-5	1-6	1-1
Menthol	20	20	24	24	24	50	60
Propylene glycol	0	60	70	70	70	28	0
Ethanol	60	0	0	0	0	0	40
Glyceryl tri(caprylate/caprates)	0	0	0	0	0	9	0
Hydroxypropyl cellulose	15	15	0	0	0	8	0
Glyceride monobehenate (HLB:4.2)	5	5	6	0	0	5	0
Decaglycerin pentastearate (HLB:4.5)	0	0	0	6	0	0	0
Propylene glycol monostearate (HLB:3.7)	0	0	0	0	6	0	0

(continued)

	Example						Compar. Example
	1-1	1-2	1-3	1-4	1-5	1-6	1-1
Total (parts by mass)	100	100	100	100	100	100	100

]Table 2]

[0230]

Table 2

	Example			Compar. Example			
	1-7	1-8	1-9	1-2	1-3	1-4	1-5
Propylene glycol	90	90	90	90	90	90	90
Glyceride monobehenate (HLB:4.2)	10	0	0	0	0	0	0
Decaglycerin pentastearate (HLB:4.5)	0	10	0	0	0	0	0
Propylene glycol monostearate (HLB:3.7)	0	0	10	0	0	0	0
Decaglycerin monolaurate (HLB:15.5)	0	0	0	10	0	0	0
Decaglycerin monomyristate (HLB:14.5)	0	0	0	0	10	0	0
Decaglycerin distearate (HLB:11.0)	0	0	0	0	0	10	0
Diglycerin monostearate (HLB:7.7)	0	0	0	0	0	0	10
Total (parts by mass)	100	100	100	100	100	100	100

[0231] "Glyceride monobehenate" in Tables 1 and 2 refers to "POEM® B-100" described above. "Decaglycerine pentastearate" in Tables 1 and 2 refers to "SUNSOFT® Q-185S" (available from Taiyo Kagaku Co., Ltd.). "SUNSOFT® Q-185S" has an HLB of 4.5. "Propylene glycol monostearate" in Tables 1 and 2 refers to "RIKEMAL® PS-100" (available from Riken Vitamin Co., Ltd.). "RIKEMAL® PS-100" has an HLB of 3.7. "Diglycerin monostearate" in Table 2 refers to "POEM® DS-100" (available from Riken Vitamin Co., Ltd.). "POEM® DS-100" has an HLB of 7.7. "Decaglycerin monomyristate" in Table 2 refers to "SUNSOFT® Q-14S" (available from Taiyo Kagaku Co., Ltd.). "SUNSOFT® Q-14S" has an HLB of 14.5.

[0232] "Decaglycerin monolaurate" in Table 2 refers to "SUNSOFT® Q-12S" (available from Taiyo Kagaku Co., Ltd.). "SUNSOFT® Q-12S" has an HLB of 15.5. "Decaglycerin distearate" in Table 2 refers to "SUNSOFT® Q-182S" (available from Taiyo Kagaku Co., Ltd.). "SUNSOFT® Q-182S" has an HLB of 11.0.

[0233] All of the flavorant compositions according to Examples 1-1 to 1-4 and 1-6 to 1-9 were solidified at room temperature.

[0234] On the other hand, all of the flavorant compositions according to Comparative Examples 1-1 to 1-5 were liquid at room temperature. The flavorant compositions according to Comparative Examples 1-2 and 1-3 were transparent, and the flavorant compositions according to Comparative Examples 1-4 and 1-5 were cloudy.

<Production of Flavor Inhalation Article>

<Example 2-1>

[0235] The flavor inhalation article 1 shown in FIGS. 1 and 2 was produced using the flavorant composition according to Example 1-1. The produced flavor inhalation article is referred to as a flavor inhalation article according to Example 2-1. The tobacco filler was carried with the flavorant composition so that the mass of menthol which is contained in the flavorant composition was 30,000 ppm relative to the mass of the tobacco filler. As the tobacco filler, an aggregate of cut pieces of sheet tobacco was used.

<Example 2-2>

5 **[0236]** A flavor inhalation article according to Example 2-2 was produced which was similar to the flavor inhalation article according to Example 2-1 except that the flavorant composition according to Example 1-2 was used instead of the flavorant composition according to Example 1-1.

<Example 2-3>

10 **[0237]** A flavor inhalation article according to Example 2-3 was produced which was similar to the flavor inhalation article according to Example 2-1, except that the flavorant composition according to Example 1-2 was used instead of the flavorant composition according to Example 1-1 and that the amount of the flavorant composition was changed to half the amount of the flavorant composition in the flavor inhalation article according to Example 2-1.

<Example 2-4>

15 **[0238]** A flavor inhalation article was produced which was similar to the flavor inhalation article 1 shown in FIGS. 1 and 2 except that the flavorant composition according to Example 1-2 was localized on the bottom surface of the tobacco filler on the upstream side without providing a hole for injection of the flavorant composition. Here, the "upstream side" is based on the flow direction of the fluid in the flavor inhalation article during inhalation of the flavor inhalation article.
20 This flavor inhalation article is referred to as a flavor inhalation article according to Example 2-4.

<Example 2-5>

25 **[0239]** A flavor inhalation article according to Example 2-5 was produced which was similar to the flavor inhalation article according to Example 2-1 except that the flavorant composition according to Example 1-3 was used instead of the flavorant composition according to Example 1-1.

<Example 2-6>

30 **[0240]** A flavor inhalation article according to Example 2-6 was produced which was similar to the flavor inhalation article according to Example 2-1 except that the flavorant composition according to Example 1-4 was used instead of the flavorant composition according to Example 1-1.

<Example 2-7>

35 **[0241]** A flavor inhalation article according to Example 2-7 was produced which was similar to the flavor inhalation article according to Example 2-1 except that the flavorant composition according to Example 1-5 was used instead of the flavorant composition according to Example 1-1.

<Example 2-8>

40 **[0242]** A flavor inhalation article was produced which was similar to the flavor inhalation article 1 shown in FIGS. 1 and 2 except that a tobacco filler not carried with a flavorant composition was provided instead of the flavorant-carrying tobacco filler and that a filter part described below was provided instead of the filter part 12. The filter part includes a flavorant-carrying filter and an inner plug wrapper that covers the flavorant-carrying filter. The flavorant-carrying filter includes the flavorant composition according to Example 1-6 and a crimped paper filter carried with the flavorant composition. The flavorant-carrying filter was obtained by the following method. First, a paper filter was crimped using a filter producing apparatus to obtain a crimped paper filter. Next, the flavorant composition according to Example 1-6 was applied to the crimped paper filter. The flavorant-carrying filter was obtained as explained above. Here, the flavorant composition was carried on the crimped paper filter so that the amount of the flavorant composition per 12 cm length of the crimped paper filter was 180 mg. This flavor inhalation article is referred to as a flavor inhalation article according to Example 2-8.
50

<Example 2-9>

55 **[0243]** A flavor inhalation article according to Example 2-9 was produced which was similar to the flavor inhalation article according to Example 2-8 except that the amount of the flavorant composition per 12 cm length of the crimped paper filter was changed from 180 mg to 250 mg.

<Comparative Example 2-1>

[0244] A flavor inhalation article according to Comparative Example 2-1 was produced which was similar to the flavor inhalation article according to Example 2-1 except that the flavorant composition according to Comparative Example 1-1 was used instead of the flavorant composition according to Example 1-1.

<Comparative Example 2-2>

[0245] A flavor inhalation article was produced which was similar to that described for Example 2-8 except that an acetate filter carried with menthol, i.e., a menthol-carrying acetate filter, was provided instead of the flavorant-carrying filter. This flavor inhalation article is referred to as a flavor inhalation article according to Comparative Example 2-2. As the acetate filter, a filter to which triacetin was added was used. The menthol-carrying acetate filter is carried with 50 mg of menthol per 12 cm length of the acetate filter. The above-described acetate filter was carried with the maximum amount of menthol in the actual product.

<Evaluation of Release Amount of Menthol>

[0246] The flavor inhalation articles according to Examples 2-1 to 2-9 and Comparative Examples 2-1 and 2-2 were smoked with an SM450 smoking machine (available from Cerulean) every 30 seconds with a puff of 55 ml for two seconds. The total particulate matter was collected on a Cambridge filter pad for each puff. Menthol was quantified for each filter pad.

[0247] The results are shown in Tables 6 to 11.

[0248] FIG. 6 is a graph indicating a relationship between the number of puffs and the release amount of menthol for the flavor inhalation articles according to Example 2-1 and Comparative Example 2-1. As shown in FIG. 6, for the flavor inhalation article according to Comparative Example 2-1, the release amount of menthol decreased with an increase in the number of puffs. On the other hand, for the flavor inhalation article according to Example 2-1, the release amount of menthol increased with an increase in the number of puffs.

[0249] FIG. 7 is a graph showing a relationship between the number of puffs and the release amount of menthol for the flavor inhalation articles according to Comparative Example 2-1 and Examples 2-2 and 2-3. As shown in FIG. 7, for the flavor inhalation article according to Comparative Example 2-1, the release amount of menthol decreased with an increase in the number of puffs. On the other hand, for the flavor inhalation articles according to Examples 2-2 and 2-3, the release amount of menthol increased with an increase in the number of puffs.

[0250] FIG. 8 is a graph showing a relationship between the number of puffs and the release amount of menthol for the flavor inhalation articles according to Examples 2-2 and 2-4. As shown in FIG. 8, for both of the flavor inhalation articles, the release amount of menthol increased with an increase in the number of puffs. From this result, it is considered that the release amount of menthol is less affected by the position of the flavorant composition in the tobacco-containing segment.

[0251] FIG. 9 is a graph showing a relationship between the number of puffs and the release amount of menthol for the flavor inhalation articles according to Examples 2-2 and 2-5. As shown in FIG. 9, for both of the flavor inhalation articles, the release amount of menthol increased with an increase in the number of puffs.

[0252] FIG. 10 is a graph showing a relationship between the number of puffs and the release amount of menthol for the flavor inhalation articles according to Examples 2-5 to 2-7. As shown in FIG. 10, for all the flavor inhalation articles, the release amount of menthol increased with an increase in the number of puffs.

[0253] FIG. 11 is a graph indicating a relationship between the number of puffs and the release amount of menthol for the flavor inhalation articles according to Examples 2-8 and 2-9 and Comparative Example 2-2. As shown in FIG. 11, for the flavor inhalation articles according to Examples 2-8 and 2-9, a decrease in the release amount of menthol with an increase in the number of puffs was suppressed as compared with the flavor inhalation article according to Comparative Example 2-2. Since the flavor inhalation articles according to Examples 2-8 and 2-9 contain the low HLB emulsifier, the amount of menthol that can be carried is larger than that of the flavor inhalation article according to Comparative Example 2-4. In particular, in the sixth to tenth puffs, the release amount of menthol of the flavor inhalation articles according to Examples 2-8 and 2-9 was stable.

REFERENCE SIGNS LIST

[0254] 1: Heating-type flavor inhalation article, 2: Heating device, 3: Combustion-type flavor inhalation article, 11: Tobacco-containing segment, 12: Filter part, 13: Connecting part, 14: Lining paper, 21: Body, 22: Heater, 23: Metal tube, 24: Battery unit, 25: Control unit, 31: Rod, 32: Filter, 33: Tipping paper, 111: Tobacco filler, 112: Cigarette paper, 113: Flavorant Composition, 121: First segment, 122: Second segment, 123: Outer plug wrapper, 131: Paper tube, 141:

Ventilation opening part, 211: Recess, 212: Ventilation hole, 311: Tobacco filler, 312: Cigarette paper, 313: Flavorant Composition, 321: Filter material, 322: Plug wrapper, 1211: First filled body, 1212: Inner plug wrapper, 1221: Second filled body, 1222: Inner plug wrapper.

5

Claims

1. A flavorant-carrying constituent member of a tobacco product, comprising:
10 a constituent member of a tobacco product; and
 a flavorant composition carried on the constituent member, and containing an emulsifier and a flavorant, the emulsifier having an HLB in a range of 1 to 7.
2. The flavorant-carrying constituent member according to claim 1, wherein a ratio M1/M2 between a mass M1 of the
15 emulsifier and a mass M2 of the flavorant is in a range 0.001 to 20.0.
3. The flavorant-carrying constituent member according to claim 1 or 2, wherein the flavorant composition further contains a solvent.
- 20 4. The flavorant-carrying constituent member according to claim 3, wherein the solvent includes a monohydric alcohol.
5. The flavorant-carrying constituent member according to any one of claims 1 to 4, wherein the emulsifier has an HLB in a range of 2 to 5.
- 25 6. The flavorant-carrying constituent member according to any one of claims 1 to 5, wherein the emulsifier includes one or more selected from the group consisting of glycerin fatty acid ester, poly glycerin fatty acid ester, propylene glycol fatty acid ester, sucrose fatty acid ester, sorbitan fatty acid ester, and lecithin.
- 30 7. The flavorant-carrying constituent member according to any one of claims 1 to 6, wherein the flavorant includes one or more selected from the group consisting of a flavor-presenting material, a taste-presenting material, a plant material, a lipid, and nicotine.
- 35 8. The flavorant-carrying constituent member according to claim 7, wherein the flavorant includes the lipid, and the lipid includes at least one of fatty acid or fatty acid ester.
9. The flavorant-carrying constituent member according to any one of claims 1 to 8, wherein the flavorant composition further contains glucan.
- 40 10. The flavorant-carrying constituent member according to claim 9, wherein the glucan is a cellulose derivative.
11. The flavorant-carrying constituent member according to claim 9 or 10, wherein the glucan is amphipathic.
- 45 12. The flavorant-carrying constituent member according to any one of claims 1 to 8, wherein the flavorant composition further contains hydroxypropyl cellulose.
13. The flavorant-carrying constituent member according to any one of claims 1 to 12, wherein the flavorant composition further contains an adsorbent.
- 50 14. The flavorant-carrying constituent member according to any one of claims 1 to 13, wherein the constituent member is a tobacco filler.
15. The flavorant-carrying constituent member according to any one of claims 1 to 13, wherein the constituent member is a filter.
- 55 16. The flavorant-carrying constituent member according to any one of claims 1 to 13, wherein the constituent member is a tube.
17. The flavorant-carrying constituent member according to any one of claims 1 to 13, wherein the constituent member

is paper.

18. The flavorant-carrying constituent member according to any one of claims 1 to 13, wherein the constituent member is a base material of a flavorant filler or cut pieces of the base material.

19. A method of producing a flavorant-carrying constituent member of a tobacco product, comprising loading, on a constituent member of a tobacco product, a flavorant composition containing an emulsifier and a flavorant, the emulsifier having an HLB in a range of 1 to 7.

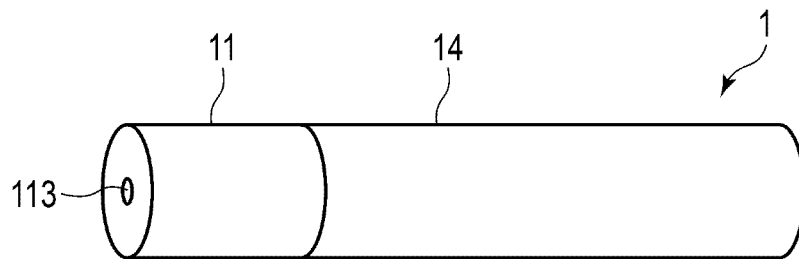


FIG. 1

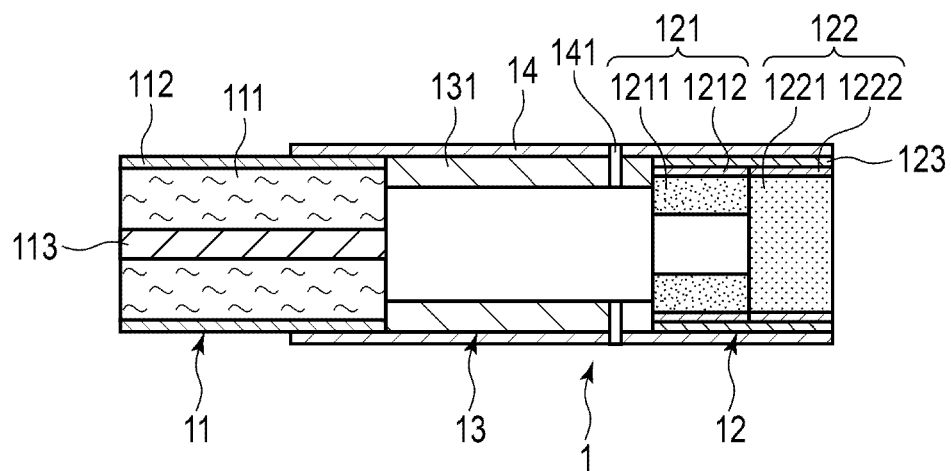


FIG. 2

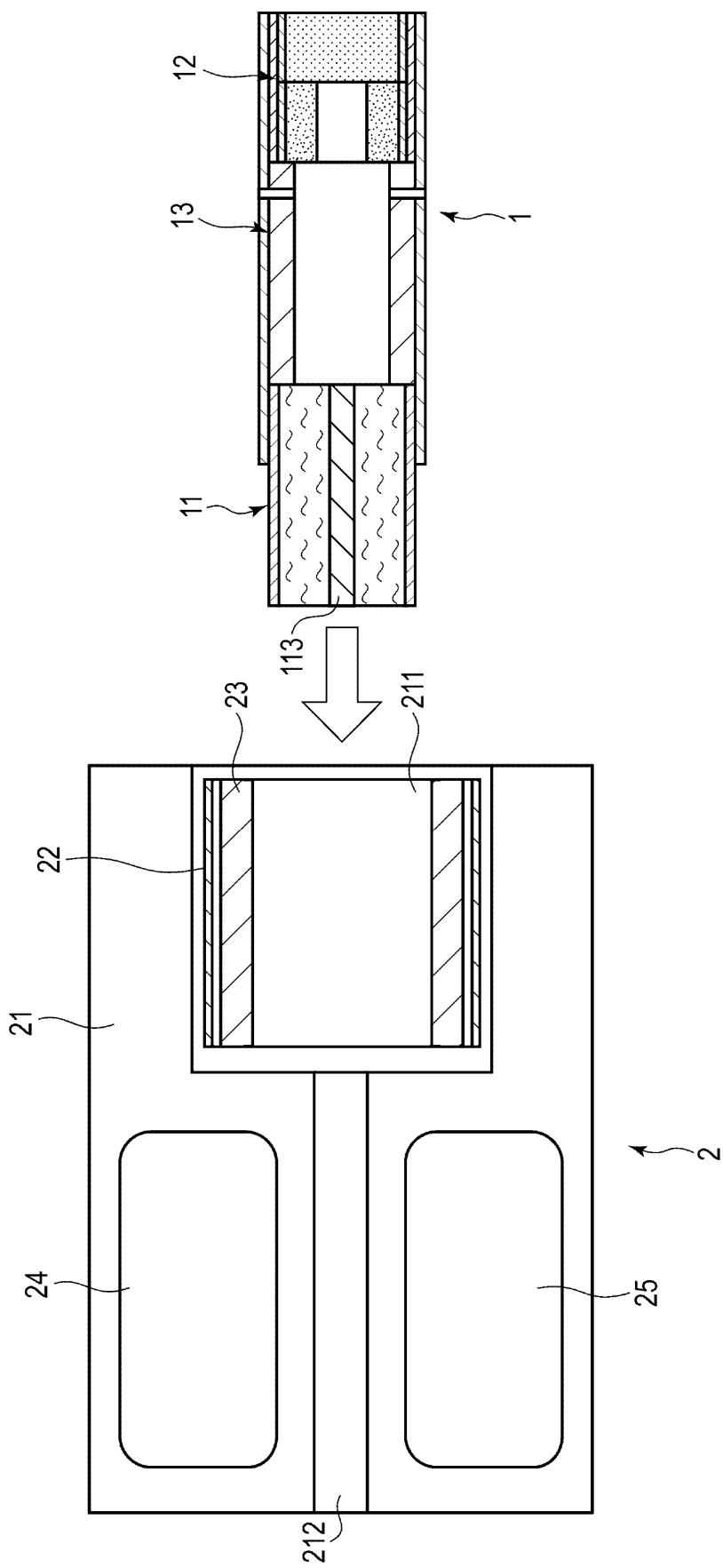


FIG. 3

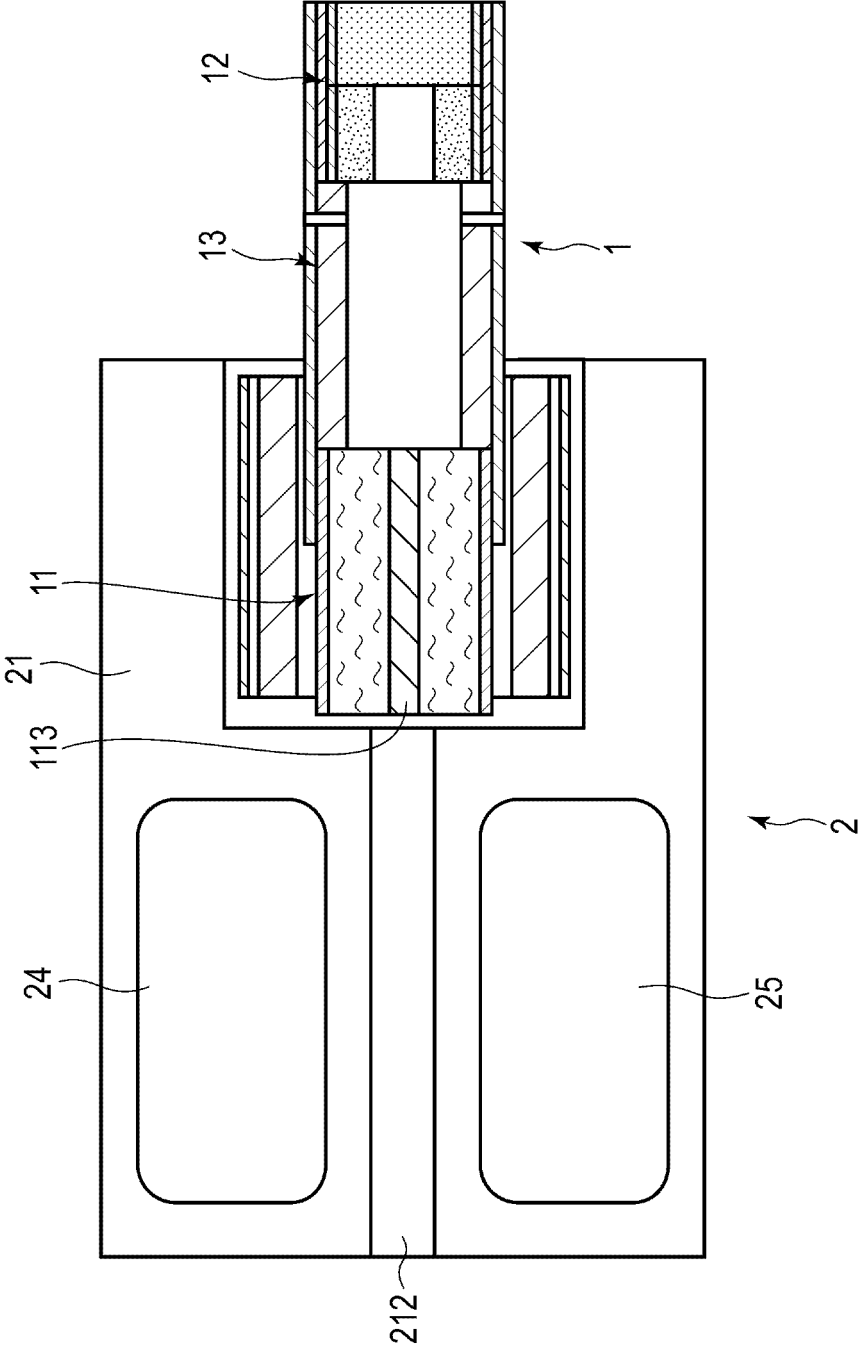


FIG. 4

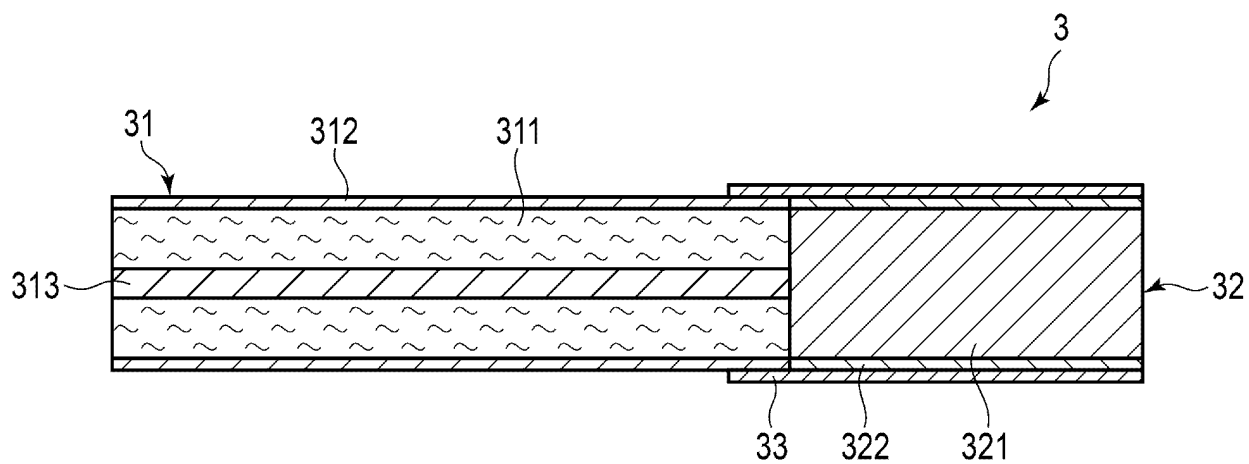


FIG. 5

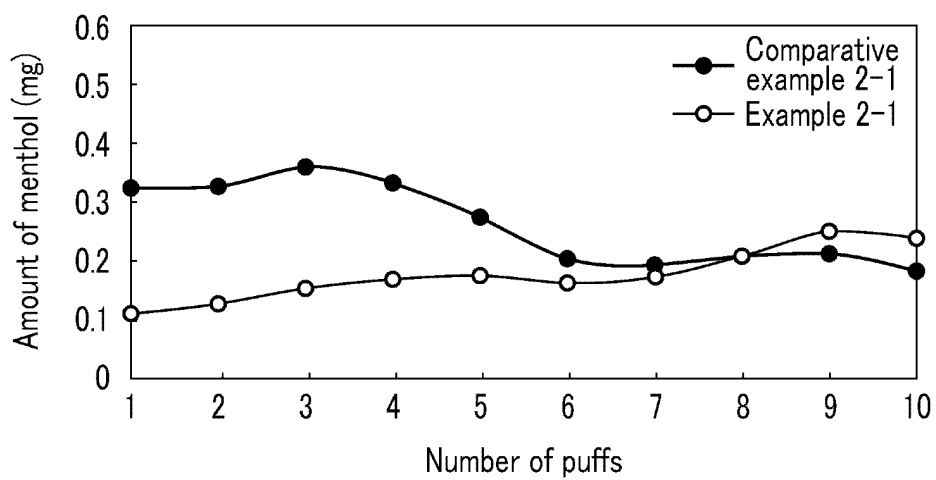


FIG. 6

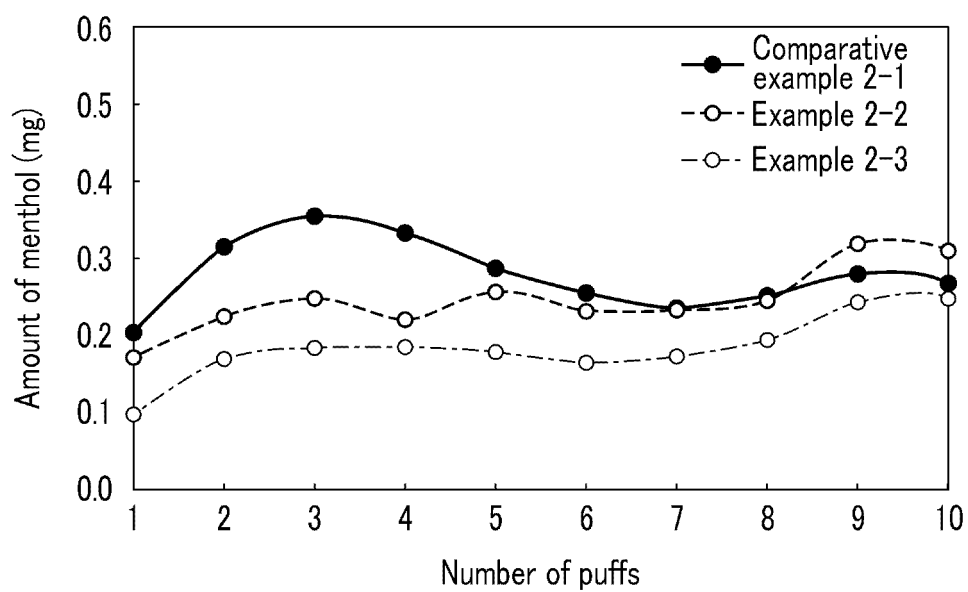


FIG. 7

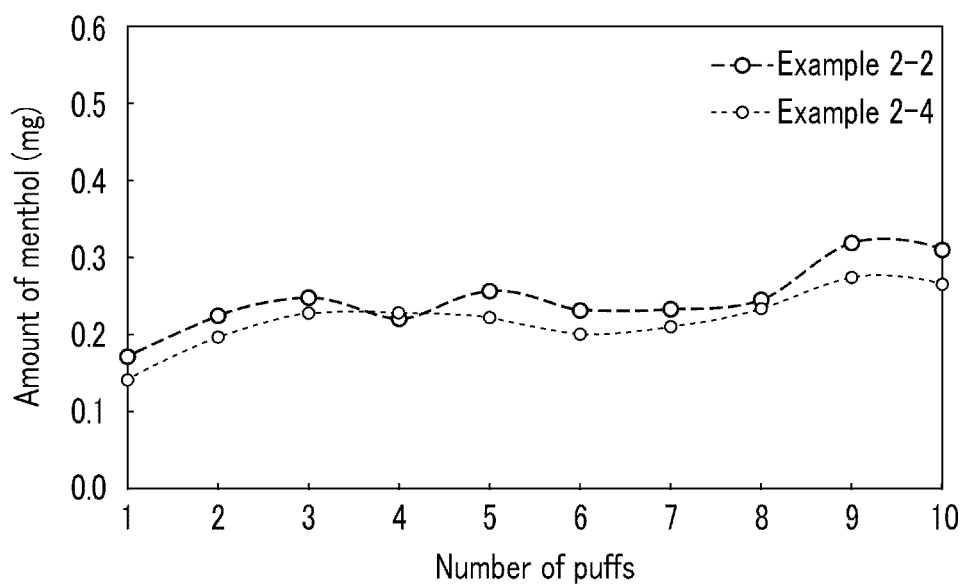


FIG. 8

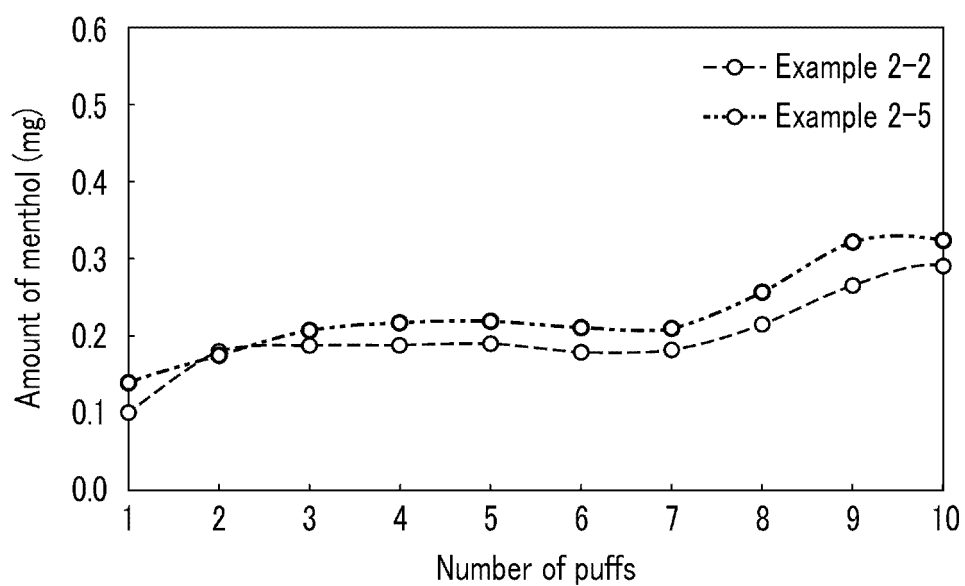


FIG. 9

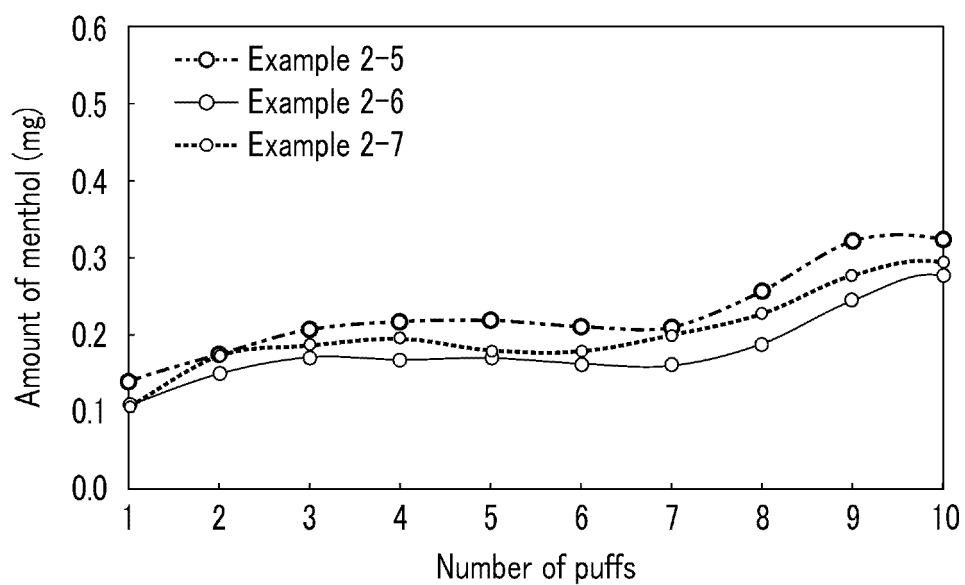


FIG. 10

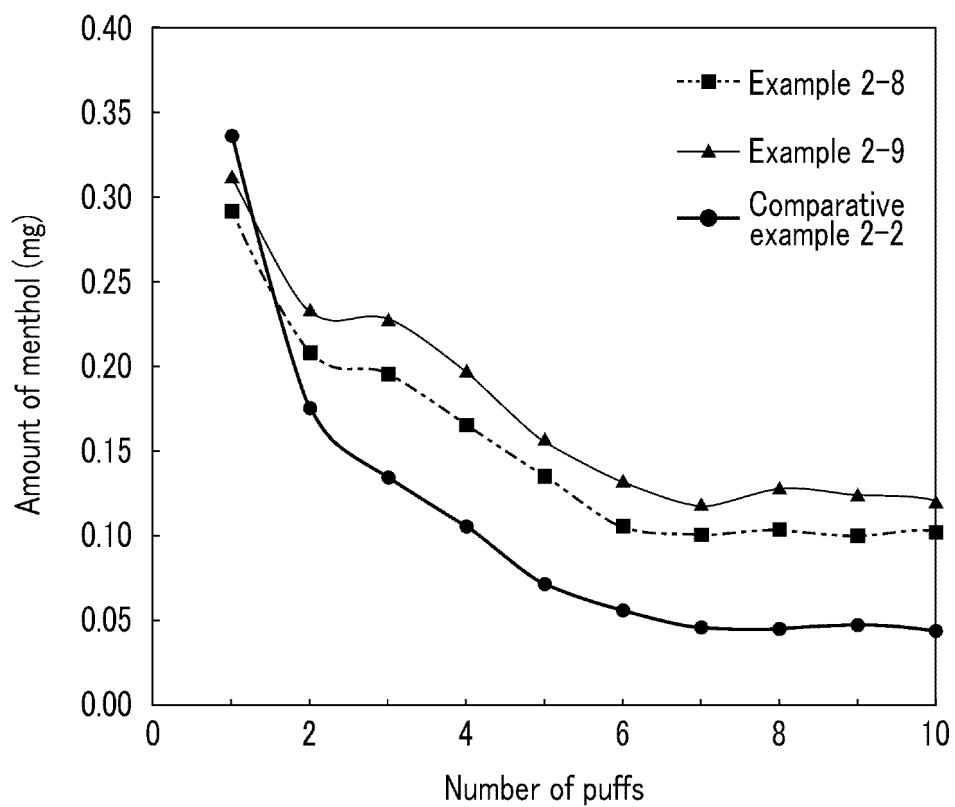


FIG. 11

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2021/027639

A. CLASSIFICATION OF SUBJECT MATTER <i>A24D 1/20</i> (2020.01)i; <i>A24F 47/00</i> (2020.01)i FI: A24D1/20; A24F47/00 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) A24D1/20; A24F47/00 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 1971-2021 Registered utility model specifications of Japan 1996-2021 Published registered utility model applications of Japan 1994-2021 Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)																		
C. DOCUMENTS CONSIDERED TO BE RELEVANT <table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>X</td> <td>WO 2020/115898 A1 (JAPAN TOBACCO INC.) 11 June 2020 (2020-06-11) paragraphs [0011]-[0033], [0056], fig. 1, 2</td> <td>1-5, 13-19</td> </tr> <tr> <td>Y</td> <td></td> <td>6-12</td> </tr> <tr> <td>Y</td> <td>WO 2013/011898 A1 (JAPAN TOBACCO INC.) 24 January 2013 (2013-01-24) paragraphs [0018]-[0021]</td> <td>6, 9-12</td> </tr> <tr> <td>Y</td> <td>WO 2012/118033 A1 (JAPAN TOBACCO INC.) 07 September 2012 (2012-09-07) paragraph [0013]</td> <td>6</td> </tr> <tr> <td>Y</td> <td>JP 2014-526240 A (PHILIP MORRIS PRODUCTS SA) 06 October 2014 (2014-10-06) paragraph [0020]</td> <td>7-8</td> </tr> </tbody> </table>	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	X	WO 2020/115898 A1 (JAPAN TOBACCO INC.) 11 June 2020 (2020-06-11) paragraphs [0011]-[0033], [0056], fig. 1, 2	1-5, 13-19	Y		6-12	Y	WO 2013/011898 A1 (JAPAN TOBACCO INC.) 24 January 2013 (2013-01-24) paragraphs [0018]-[0021]	6, 9-12	Y	WO 2012/118033 A1 (JAPAN TOBACCO INC.) 07 September 2012 (2012-09-07) paragraph [0013]	6	Y	JP 2014-526240 A (PHILIP MORRIS PRODUCTS SA) 06 October 2014 (2014-10-06) paragraph [0020]	7-8
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.																
X	WO 2020/115898 A1 (JAPAN TOBACCO INC.) 11 June 2020 (2020-06-11) paragraphs [0011]-[0033], [0056], fig. 1, 2	1-5, 13-19																
Y		6-12																
Y	WO 2013/011898 A1 (JAPAN TOBACCO INC.) 24 January 2013 (2013-01-24) paragraphs [0018]-[0021]	6, 9-12																
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Y	JP 2014-526240 A (PHILIP MORRIS PRODUCTS SA) 06 October 2014 (2014-10-06) paragraph [0020]	7-8																
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Date of the actual completion of the international search 16 September 2021	Date of mailing of the international search report 28 September 2021																	
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.																	

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/JP2021/027639

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