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

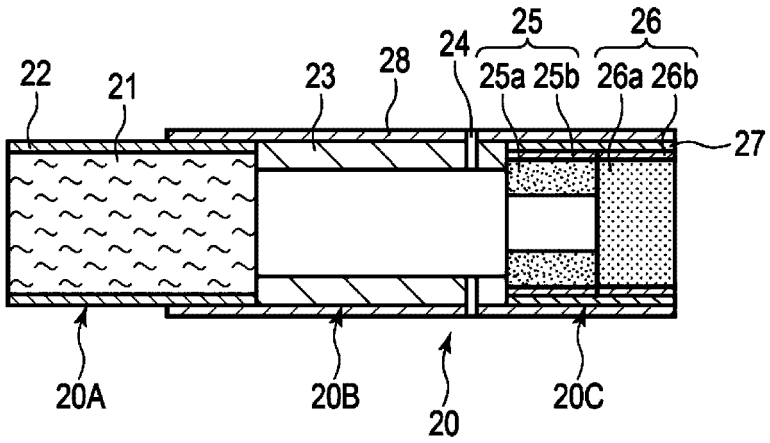
(72) Inventors:
- **YOKOTE, Shunsuke**
  Tokyo 130-8603 (JP)
- **UCHII, Kimitaka**
  Tokyo 130-8603 (JP)
- **ROKUGAWA, Masaki**
  Tokyo 130-8603 (JP)

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

(54) TOBACCO COMPOSITION CONTAINING SATURATED FATTY ACID ADDITIVE

(57) The invention is a tobacco composition containing (A) a tobacco material and (B) a saturated fatty acid additive, wherein: the component (B) is selected from the group consisting of saturated fatty acids that have a molar mass of 200 to 350 g/mol, esters of such saturated fatty acids, and combinations thereof; and the tobacco composition contains the component (B) at 0.01 to 3 mass% per dry weight in the composition.

Fig. 1



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Description

TECHNICAL FIELD

[0001] The present invention relates to a tobacco composition containing a saturated fatty acid additive.

BACKGROUND ART

[0002] Non-combustion-type tobaccos have been developed instead of combustion-type tobaccos known in the related art. The use of additives has been proposed to improve the performance of non-combustion-type tobaccos. For example, PTL 1 discloses addition of a lipid to promote diffusion of volatile components. PTL 2 discloses addition of a wax to enhance diffusivity of volatile components.

[0003] However, non-combustion-type tobaccos have an important issue of discomfort during smoking (hereinafter also simply referred to as "discomfort") from the viewpoint of customer acceptance. PTLs described above have no indication related to reduction in discomfort, and it has been proposed that discomfort is reduced by adding a flavoring agent and selecting a blend of leaves. However, this method requires adjusting the composition ratio or other properties depending on tobacco raw materials used and lacks general versatility. There is therefore a need of other methods for reducing discomfort.

CITATION LIST

PATENT LITERATURE

[0004]

PTL 1: International Publication No. WO 2018/215481
PTL 2: Japanese Patent No. 6433626

SUMMARY OF INVENTION

TECHNICAL PROBLEM

[0005] In light of such circumstances, an object of the present invention is to provide a tobacco composition that provides a tobacco filler capable of reducing discomfort.

SOLUTION TO PROBLEM

[0006] The inventors of the present invention have achieved the above abject by adding particular additives. More specifically, the object is achieved by the present invention described above.

First Aspect

[0007] A tobacco composition including:

(A) a tobacco material; and
(B) a saturated fatty acid additive,

wherein: the component (B) is selected from the group consisting of saturated fatty acids having a molar mass of 200 to 350 g/mol, esters of such saturated fatty acids, and combinations thereof; and

[0008] the tobacco composition contains the component (B) at 0.01 to 3 mass% per dry weight in the composition.

Second Aspect

[0009] The composition according to the first aspect, wherein, in the component (B), the saturated fatty acids are a single substance and the esters of the saturated fatty acids are a single substance.

Third Aspect

[0010] The composition according to the first or second aspect, wherein the saturated fatty acids and the esters in the component (B) have a fatty acid moiety with 12 to 20 carbon atoms.

Fourth Aspect

[0011] The composition according to any one of the first to third aspects, further including a liquid sugar at 1 to 10 mass% per dry weight in the composition.

Fifth Aspect

[0012] The composition according to any one of the first to fourth aspects, wherein the component (A) contains a material derived from an oriental species at 10 mass% or less.

Sixth Aspect

[0013] The composition according to any one of the first to fifth aspects, further including a natural plant flavoring agent at 0.5 to 3 mass% per dry weight in the composition.

Seventh Aspect

[0014] The composition according to any one of the first to sixth aspects, including nicotine at 2 mass% or more per dry weight in the composition.

Eighth Aspect

[0015] The composition according to any one of the first to sixth aspects, including nicotine at 1.5 mass% or less per dry weight in the composition.

Ninth Aspect

[0016] The composition according to any one of the first to eight aspects, further including an aerosol-source material at 12 mass% or less per dry weight in the composition.

Tenth Aspect

[0017] A sheet formed from the tobacco composition according to any one of the first to ninth aspects.

Eleventh Aspect

[0018] A method of manufacturing the tobacco composition according to any one of the first to tenth aspects, the method including preparing a slurry by mixing the component (A), the component (B), which is partially or entirely powder, and a medium such that the powder is maintained in a powder state.

Twelfth Aspect

[0019] The manufacturing method according to the eleventh aspect, further including adjusting a viscosity of the slurry to 100,000 to 200,000 (mPa s).

ADVANTAGEOUS EFFECTS OF INVENTION

[0020] The present invention can provide a tobacco composition that provides a tobacco filler capable of reducing discomfort.

BRIEF DESCRIPTION OF DRAWINGS

[0021]

Fig. 1 is a view of one aspect of a non-combustion-heating-type tobacco flavor inhalation article.
Fig. 2 is a view of an aspect of a non-combustion-heating-type tobacco flavor inhalation system.
Fig. 3 is a view of another aspect of the non-combustion-heating-type tobacco flavor inhalation article.

DESCRIPTION OF EMBODIMENTS

[0022] A tobacco composition contains (A) a tobacco material and (B) a saturated fatty acid additive. The present invention will be described below in detail. In the present invention, "X to Y" is inclusive of end values X and Y.

1. Tobacco Composition

(1) Tobacco Material (Component (A))

[0023] The tobacco composition contains a tobacco material as a component (A). The tobacco material is a material derived from genus Nicotiana plants. Specific examples of tobacco materials include shredded dry tobacco leaves, ground leaf tobacco, and tobacco extracts (extracts in water, organic solvent, or mixed solutions thereof). Ground leaf tobacco is particles produced by grinding leaf tobacco. Ground leaf tobacco preferably has, for example, an average particle size D50 of 30 to 120 μm, more preferably has an average particle size D50 of 50 to 100 μm. Grinding can be performed by using a known grinder in a dry mode or wet mode. Therefore, ground leaf tobacco is also referred to as leaf tobacco particles. In the present invention, the particle size and the average particle size are determined by a laser diffraction/scattering method, and specifically measured by using a laser diffraction particle size distribution analyzer (e.g., LA-950 available from HORIBA, Ltd.). Examples of the type of tobacco include, but are not limited to, yellow species, Burley species, oriental species, local species, and other species belonging to Nicotiana tabacum or Nicotiana rustica.

[0024] The amount of the component (A) in the tobacco composition is not limited. The lower limit of the amount of the component (A) per dry weight of the tobacco composition may be 60 mass% or more, 70 mass% or more, 80 mass% or more, 90 mass% or more, 95 mass% or more, 97 mass% or more, 99 mass% or more, or 99.5 mass% or more. The upper limit may be 99.9 mass% or less, 97 mass% or less, 95 mass% or less, 90 mass% or less, or 80 mass% or less.

[0025] The component (A) may contain a material derived from an oriental species. In such a case, the amount of the material derived from an oriental species in the component (A) is preferably 10 mass% or less. If the amount of the material derived from an oriental species is in this range, the smoke taste with less discomfort can be provided. From this viewpoint, the upper limit of the amount of the material derived from an oriental species in the component (A) is preferably 8 mass% or less, more preferably 5 mass% or less. The lower limit is preferably 0.1 mass% or more, more preferably 2 mass% or more, still more preferably 3 mass% or more.

(2) Saturated Fatty Acid Additive (Component (B))

[0026] The tobacco composition contains a saturated fatty acid additive as a component (B). The saturated fatty acid additive is selected from the group consisting of saturated fatty acids that have a molar mass of 200 to 350 g/mol, esters of such saturated fatty acids, and combinations thereof. The saturated fatty acids reduce discomfort during smoking. Since the esters of the saturated fatty acids are formed from alcohols and saturated fatty acids that have a molar mass of 200 to 350 g/mol, the molar mass of the esters varies depending on the molar mass of alcohols. The molar mass of the esters is 210 to 1300 g/mol in one aspect. The esters of the saturated fatty acids keep the discomfort-reducing effect during smoking throughout the entire smoking time because the esters of the saturated fatty acids normally have lower vapor pressure than saturated fatty acids. Hereinafter, the discomfort-reducing effect during smoking is also referred to simply as the discomfort-reducing effect.

[0027] To obtain the above effect, the lower limit of the molar mass of the saturated fatty acid esters is preferably 240 g/mol or more, more preferably 270 g/mol or more. The upper limit is preferably 1140 g/mol or less, 1112 g/mol or less, 300 g/mol or less, or 290 g/mol or less.

[0028] The amount of the component (B) is 0.01 to 3 mass% per dry weight (dry weight is defined as 100 mass%) in the composition. If the amount is less than the lower limit, the discomfort-reducing effect is insufficient. If the amount is more than the upper limit, foreign odors are more noticeable. From this viewpoint, the lower limit of the amount is preferably 1 mass% or more, and the upper limit is preferably 2 mass% or less. The dry weight is the weight excluding the medium described below, preferably the weight of the residue after drying the composition at 100°C for 5 hours.

[0029] The fatty acid moiety in the saturated fatty acids and the esters preferably has 12 to 20 carbon atoms, more preferably has 15 to 19 carbon atoms. When the number of carbon atoms is in this range, the discomfort-reducing effect is more noticeable.

[0030] The solubility of the saturated fatty acids of the component (B) in water is preferably 0.15 mg/g or less, more

preferably 0.12 mg/g or less. The lower limit is not limited and may be 0 mg/g, but preferably 0.05 mg/g or more.

[0031] Suitable specific examples of the saturated fatty acids include octanoic acid, decanoic acid, myristic acid, palmitic acid, stearic acid, and nonadecanoic acid. In particular, palmitic acid, stearic acid, or nonadecanoic acid is preferred from the viewpoint of availability and discomfort-reducing effect. The saturated fatty acids may be a mixture, but preferably a single substance instead of a mixture. Single substances (single compounds) in the present invention include pure compounds and compounds containing unavoidable impurities. In one aspect, the saturated fatty acid consists of palmitic acid. When the saturated fatty acid is a single substance, the saturated fatty acid has higher dispersibility in a formed product, such as a sheet, formed from the tobacco composition of the present invention.

[0032] Suitable specific examples of the esters of the saturated fatty acids (hereinafter referred to simply as "esters") include alkyl esters and sugar esters of the saturated fatty acids. The alkyl moiety is preferably derived from a linear, branched, or cyclic alkyl group with 1 to 10 carbon atoms, such as methyl group. The sugar moiety is preferably derived from a disaccharide, such as sucrose. Suitable examples of the esters include sucrose palmitate and methyl palmitate. The saturated fatty acid moiety in the esters is preferably derived from a single saturated fatty acid from the reason described above. The alcohol moiety in the esters is not necessarily a single substance, but preferably a single substance from the reason described above. The esters also function as an emulsifier.

[0033] In one aspect, the component (B) contains the saturated fatty acid and the ester. In this case, there is an advantage that the discomfort-reducing effect lasts longer. The type of the component (B) can be appropriately selected according to the component (A) used. Therefore, the present invention has an advantage of being versatile.

[0034] Preferably, the component (B) is partially or entirely powder. When the component (B) is powder, the component (B) has higher dispersibility in a formed body, such as a sheet, as described below. The size is not limited, but D50 is preferably, for example, 30 to 120 μm, more preferably 50 to 100 μm. From the viewpoint of the dispersibility, the component (B) preferably has higher crystallinity than waxes and natural fats.

(3) Liquid Sugar

[0035] The tobacco composition may contain a liquid sugar. The liquid sugar is sugar in a liquid form. The tobacco composition containing a liquid sugar reduces discomfort and improves sweetness during smoking. From this viewpoint, the amount of the liquid sugar per dry weight in the tobacco composition is preferably 1 to 10 mass%, more preferably 3 to 10 mass%, still more preferably 5 to 8 mass%.

(4) Natural Plant Flavoring Agent

[0036] The tobacco composition may contain a natural plant flavoring agent. The tobacco composition containing a natural plant flavoring agent provides the discomfort-reducing effect and improves sweetness. From this viewpoint, the amount of the natural plant flavoring agent per dry weight in the tobacco composition is preferably 0.5 to 3 mass%, more preferably 2 to 3 mass%. The natural plant flavoring agent may be one known in the field of tobacco, preferably licorice in the present invention. Licorice is a sweetener derived from Spanish licorice, which belongs to the genus Glycyrrhiza of the legume family.

(5) Nicotine

[0037] The amount of nicotine contained in the tobacco composition is not limited, and may be 2 mass% or more per dry weight in the composition in one aspect. In general, discomfort during smoking tends to increase as the amount of nicotine increases. In the present invention, the discomfort-reducing effect is achieved as described above, and the advantageous effect of the present invention is more noticeable when the amount of nicotine is in the range described above. The upper limit of the amount of nicotine is not limited, but realistically 3 mass% or less.

[0038] In another aspect, the amount of nicotine may be 1.5 mass% or less. When the amount of nicotine is in this range, mild inhaling flavor can be provided. The lower limit of the amount of nicotine is not limited, but realistically 0.1 mass% or more. Nicotine contained in the tobacco composition may be derived from the component (A) or may be derived from other components.

(7) Aerosol-Source Material

[0039] The aerosol-source material is a material that generates aerosol when vaporized with heat and then cooled or that generates aerosol when atomized. The aerosol-source material may be known one, and examples of the aerosol-source material include polyhydric alcohols, such as glyceride, vegetable glycerine, propylene glycol (PG); triethyl citrate (TEC); and triacetin. The amount of the aerosol-source material per dry weight in the tobacco composition is preferably 12 mass% or less, more preferably 11 mass% or less. The lower limit is not limited and may be 0 mass%, but preferably

1 mass% or more. If the amount of the aerosol-source material is more than the upper limit, it may be difficult to manufacture a sheet or other formed bodies. If the amount of the aerosol-source material is less than the lower limit, the smoke flavor may be reduced.

(8) Binder

[0040] The tobacco composition containing a binder improves the strength when processed into a formed body, such as a sheet. The binder is an adhesive for bonding fibers to each other or other materials. The binder may be one known in the art. Examples of the binder include thickening polysaccharides, such as gums, modified cellulose, and modified starch. The amount of the binder is appropriately adjusted according to the application, and may be, for example, about 1 to 10 mass% per dry weight in the tobacco composition.

(9) Fiber

[0041] The tobacco composition containing a fiber improves the strength when processed into a formed body, such as a sheet. Examples of the fiber include cellulose fibers derived from tobacco, and cellulose fibers and cellulose powders not derived from tobacco. The fiber is, for example, pulp fiber. Pulp fiber is an assembly of cellulose fibers taken out from plants, such as wood, and is usually used as a raw material for paper. Examples of pulp fiber include waste paper pulp, chemical pulp, and mechanical pulp. From the viewpoint of the mechanical strength or other properties of a formed sheet, the amount of the fiber per dry weight in the tobacco sheet composition is preferably 1 to 20% by weight, more preferably 2 to 10% by weight.

(10) Form of Tobacco Composition

[0042] The tobacco composition is a mixture containing the components described above. The form of the tobacco composition may be solid, paste, or liquid.

2. Method of Manufacturing Tobacco Composition

[0043] The tobacco composition is manufactured by any method. For example, the tobacco composition can be manufactured by mixing the components (A) and (B) and other optional components by a known method. In this case, the component (B) in a powder state is preferably used and mixed such that the component (B) is maintained in a powder state. In the tobacco composition thus manufactured, the component (B) has higher dispersibility. Higher dispersibility means that the component (B) is uniformly dispersed. The mixing process is preferably performed at a temperature lower or equal to the melting point of the component (B). For example, this process can be performed at 10°C to 50°C.

[0044] A slurry containing the tobacco composition can be prepared by diluting the tobacco composition with a medium. The slurry is preferably manufactured by a method including the following step.

[0045] A step of preparing a slurry by mixing the component (A), the component (B), which is partially or entirely powder, and a medium such that the powder is maintained in a powder state.

[0046] In this manufacturing method, the slurry is prepared while the component (B) is maintained in a powder state. This improves the dispersibility of the component (B) when the tobacco composition is processed into a formed body. The size of the powder is as described above. The expression the component (B) is maintained in a powder state means that part or all of the component (B) is maintained in a powder state.

[0047] Examples of the medium include water and hydrophilic organic solvents. In view of handling, the most preferred medium is water.

[0048] In this method, first, materials that are solid at room temperature are processed into powders by grinding or other methods, and these powders are mixed to form a powder mixture. Materials that are liquid or paste at room temperature, such as a medium, are mixed to form a liquid mixture. Then, a step of mixing the powder mixture and the liquid mixture is preferably provided.

[0049] To disperse the component (B) in a powder state well in the medium, the viscosity of the slurry at 25°C is preferably 100,000 to 200,000 (mPa·s). The viscosity is measured with a B-type viscometer (DV-I prime available from Brookfield) using Spindle No. LV4 at a rotation speed of 1.0 rpm.

[0050] The tobacco composition-containing slurry thus prepared is useful as a raw material for sheets as described below, and further useful as, for example, an additive for tobacco flavor inhalation articles, such as a tobacco filler, a wrapper, and a filter. The medium in the slurry is not a component of the tobacco composition. The amount of the tobacco composition in the slurry is preferably 3 to 15 mass% in one aspect, and preferably 50 to 90 mass% in another aspect.

3. Sheet

[0051] A sheet can be manufactured from the tobacco composition of the present invention. In other words, the tobacco composition may be a tobacco composition sheet. Hereinafter, this sheet is also referred to as a "tobacco sheet". The tobacco sheet may be manufactured by any method, and preferably manufactured by the following methods.

(1) Casting Method

[0052] This method includes a slurry preparing step of preparing a slurry containing the tobacco composition, a casting step of preparing a wet sheet by casting the composition on a substrate, and a drying step of drying the wet sheet.

(1-1) Slurry Preparing Step

[0053] This step can be performed as described above. The amount of the tobacco composition in the slurry prepared in this step is preferably about 3 to 15 % by weight. A particularly preferred aspect will be described below.

1) Tobacco leaves or lamina is ground as the component (A) to form a ground material with$D90 \geq$ about 100 μm.
2) The component (B) is ground.
3) A reinforcing material (e.g., pulp) is pulverized.
4) The powder materials prepared above in 1) and 2) are mixed to form a powder mixture.
5) Liquid or paste materials, such as a medium and an aerosol-source material, are mixed to form a liquid mixture.
6) The pulverized reinforcing material in 3) is added to the liquid mixture in 5) and dispersed therein.
7) The powder mixture in 4) is added to the dispersion in 6) and mixed.

(1-2) Casting Step

[0054] In this step, the slurry is cast on the substrate to form a wet sheet. Casting can be performed by a known method.

(1-3) Drying Step

[0055] In this step, the wet sheet is dried to form a tobacco sheet. The drying condition is preferably 50°C to 100°C, and the drying time may be 5 to 60 min. The tobacco sheet prepared in this method is also referred to as a "cast sheet".

(2) Rolling Method

[0056] This method includes a slurry preparing step of preparing a slurry containing the tobacco composition, a flattening step of preparing a wet sheet from the composition and flattening the wet sheet, and a drying step of drying the wet sheet. In a preferred aspect, the use of ground simple leaves as the component (A) will be described.

(2-1) Slurry Preparing Step

1) Grind

[0057] Simple leaves are prepared as the component (A) and roughly ground. Next, the roughly ground simple leaves are finely ground by using a grinder (e.g., ACM-5 available from Hosokawa Micron Corporation). The particle size (D90) after fine grinding is preferably 50 to 800 μm. The particle size is measured by using a laser diffraction particle size analyzer, such as Mastersizer (available from Malvern).

2) Prepare Wet Powder

[0058] The component (B) and optional additives, such as a binder, a flavoring agent, or a lipid, are added to the ground component (A) (e.g., tobacco particles) and mixed. Since this mixing is preferably dry blending, a mixer is preferably used as a mixing machine. Next, a medium, such as water, and an optional aerosol-source material, such as glycerine, are added to the dry-blended material, and mixed with a mixer to prepare a wet powder (powder in wet state). The amount of the medium in the wet powder is 20 to 80% by weight, preferably 20 to 40% by weight, or may be 20 to 50% by weight because flattening is next performed. The amount of the tobacco composition in the wet powder is preferably 50 to 90% by weight. This step is preferably performed such that the component (B) is maintained in a powder state.

3) Knead

[0059] The wet powder is kneaded by using a single-screw or multi-screw kneading machine, for example, a kneader (e.g., DG-1 available from DALTON Corporation). Kneading is preferably performed until the medium spreads throughout the mixture, for example, preferably performed until the color of the mixture becomes uniform as visually observed. This step is also preferably performed such that the component (B) is maintained in a powder state.

(2-2) Flattening Step

[0060] With the wet powder sandwiched between two substrate films, the wet powder is passed through a pair of rollers and flattened into a predetermined thickness (more than 100 μm) in a calendering machine (e.g., Yuri Roll Machine Co., Ltd.) to form a laminate including a wet sheet between two substrate films. Flattening between the rollers can be performed multiple times. The substrate films are preferably non-adhesive films, such as fluoropolymer films. Specific examples of non-adhesive films include Teflon (registered trademark) films.

(2-3) Drying Step

[0061] One substrate film is peeled from the laminate. The laminate is dried by using a forced-air dryer. The drying temperature is preferably 50°C to 100°C, and the drying time may be 1 to 2 min. Next, the other substrate film is peeled, and the resulting sheet is dried under the above conditions to form a tobacco sheet. This drying can avoid the tobacco sheet from adhering to other substrates.

[0062] The tobacco sheet prepared in this method is also referred to as a "laminate sheet". The laminate sheet has a smooth surface and prevents shreds of tobacco from falling upon contact with other members, which is preferred. This method is suitable for manufacture of a sheet with 300 μm or less.

(3) Papermaking Method

[0063] This method includes a slurry preparing step of preparing a slurry containing the tobacco composition, a step of preparing a papermaking tobacco sheet, and an adding step of adding the slurry to the sheet.

(3-1) Slurry Preparing Step

[0064] This step can be performed as described above. This step is also preferably performed such that the component (B) is maintained in a powder state. The amount of the tobacco composition in the slurry prepared in this step is preferably 3 to 15 mass%.

(3-2) Step of Preparing Papermaking Sheet

[0065] In this method, a papermaking tobacco sheet is prepared by a known papermaking method.

(3-3) Adding Step

[0066] In this method, the slurry is applied to the papermaking tobacco sheet by spraying, coating, dipping, or other methods.

4. Tobacco Flavor Inhalation Article

[0067] In the present invention, the "flavor inhalation article" refers to an article that allows users to inhale flavors. Flavor inhalation articles that contain tobacco or components derived from tobacco are referred to as "tobacco flavor inhalation articles." Tobacco flavor inhalation articles are roughly classified into "combustion-type tobacco flavor inhalation articles" (also referred to simply as "smoking articles"), which generate flavors by combustion, and "non-combustion-type tobacco flavor inhalation articles", which generate flavors without combustion. Non-combustion-type tobacco flavor inhalation articles are roughly classified into "non-combustion-heating-type tobacco flavor inhalation articles", which generate flavors by heating, and "non-combustion-non-heating-type tobacco flavor inhalation articles", which generate flavors without heating. The tobacco composition of the present invention is suitable for combustion-type tobacco flavor inhalation articles or non-combustion-heating-type tobacco flavor inhalation articles".

(1) Combustion-Type Tobacco Flavor Inhalation Article

[0068] Combustion-type tobacco flavor inhalation articles may have a known structure. For example, combustion-type tobacco flavor inhalation articles may include a tobacco rod portion and a filter. The tobacco rod portion includes the tobacco composition of the present invention.

(2) Non-Combustion-Heating-Type Tobacco Flavor Inhalation Article

[0069] Fig. 1 illustrates one aspect of a non-combustion-heating-type tobacco flavor inhalation article. Referring to Fig. 1, a non-combustion-heating-type tobacco flavor inhalation article 20 includes a tobacco rod portion 20A, a cooling portion 20B, which has a cylindrical shape and has a perforation on its circumference, and a filter portion 20C. The non-combustion-heating-type tobacco flavor inhalation article 20 may have other members. The length of the non-combustion-heating-type tobacco flavor inhalation article 20 in the axial direction is not limited, and preferably 40 to 90 mm, more preferably 50 to 75 mm, still more preferably 50 to 60 mm or less. The length of the circumference of the non-combustion-heating-type tobacco flavor inhalation article 20 is preferably 16 to 25 mm, more preferably 20 to 24 mm, still more preferably 21 to 23 mm. For example, the tobacco rod portion 20A has a length of 20 mm, the cooling portion 20B has a length of 20 mm, and the filter portion 20C has a length of 7 mm in one aspect. The length of each member can be appropriately changed according to manufacturing suitability, required quality, and other factors. Fig. 1 illustrates an aspect in which a first segment 25 is disposed. Instead of disposing the first segment 25, only a second segment 26 may be disposed downstream of the cooling portion 20B.

1) Tobacco Rod Portion 20A

[0070] In the tobacco rod portion 20A, a tobacco composition sheet can be used as a tobacco filler 21. The tobacco composition sheet may be cut into shreds or strands. A mixture of common tobacco shreds or strands with the tobacco composition of the present invention may be used as the tobacco filler 21. The tobacco filler 21 may be packed inside a wrapping paper 22 by any method. For example, the tobacco filler 21 may be wrapped with the wrapping paper 22, or the tobacco filler 21 may be packed inside the wrapping paper 22 having a cylindrical shape. When the shape of tobacco has a longitudinal direction, like a rectangle, the tobacco filler 21 may be packed such that the longitudinal direction is randomly oriented in the wrapping paper 22, or may be packed such that the longitudinal direction is aligned in the axial direction of the tobacco rod portion 20A or in a direction perpendicular to this axial direction. A wrapping paper containing the tobacco composition of the present invention can also be used as the wrapping paper 22. Heating the tobacco rod portion 20A causes vaporization of tobacco components contained in the tobacco filler 21, the aerosol-source material, and water, and the vaporized substances are then inhaled.

2) Cooling Portion 20B

[0071] The cooling portion 20B is preferably composed of a cylindrical member. The cylindrical member may be, for example, a paper tube 23 made by processing cardboard into a cylindrical shape. The cooling portion 20B may be formed by a sheet of thin material that has been wrinkled and then pleated, gathered, or folded to form a channel. Such a material may be, for example, a sheet material selected from the group consisting of polyethylene, polypropylene, polyvinyl chloride, polyethylene terephthalate, polylactic acid, cellulose acetate, and aluminum foil. The total surface area of the cooling portion 20B is appropriately adjusted in consideration of cooling efficiency, and may be, for example, 300 to 1000 mm^2/mm. The cooling portion 20B preferably has a perforation 24. The presence of the perforation 24 allows introduction of outside air into the cooling portion 20B during inhalation. With this configuration, the aerosol vaporization components generated by heating the tobacco rod portion 20A come into contact with outside air and decrease in temperature so that the aerosol vaporization components becomes liquid to form aerosol. The diameter (diameter length) of the perforation 24 is not limited, and may be, for example, 0.5 to 1.5 mm. The number of the perforation 24 is not limited, and may be one or two or more. For example, there is a plurality of the perforations 24 on the circumference of the cooling portion 20B.

[0072] The cooling portion 20B may have, for example, a rod shape with a length of 7 to 28 mm in the axial direction. For example, the cooling portion 20B may have a length of 18 mm in the axial direction. The cooling portion 20B may have a substantially circular cross-sectional shape in the axial direction, with a diameter of 5 to 10 mm. For example, the cooling portion may have a diameter of about 7 mm.

3) Filter Portion 20C

[0073] The filter portion 20C may have any structure and may include one or more filler layers. The outside of the filler

layer may be wrapped with one or more sheets of wrapping paper. The ventilation resistance of the filter portion 20C can be appropriately changed by, for example, the amount and material of the filler packed in the filter portion 20C. For example, when the filler is cellulose acetate fiber, the ventilation resistance can be increased by increasing the amount of cellulose acetate fiber packed in the filter portion 20C. When the filler is cellulose acetate fiber, the packing density of the cellulose acetate fiber may be 0.13 to 0.18 g/cm^3. The ventilation resistance is measured by using a ventilation resistance meter (product name: SODIMAX, available from SODIM).

[0074] The length of the circumference of the filter portion 20C is not limited, and preferably 16 to 25 mm, more preferably 20 to 24 mm, still more preferably 21 to 23 mm. The length of the filter portion 20C in the axial direction (horizontal direction in Fig. 1) can be selected in the range of 4 to 10 mm such that the ventilation resistance of the filter portion 20C becomes 15 to 60 mm H_2O/seg. The length of the filter portion 20C in the axial direction is preferably 5 to 9 mm, more preferably 6 to 8 mm. The cross-sectional shape of the filter portion 20C is not limited, and may be, for example, circular, elliptical, polygonal, or other shapes. Flavoring agent-containing destructible capsules, flavoring agent beads, or a flavoring agent may be directly added to the filter portion 20C.

[0075] The filter portion 20C may include a center hole portion as the first segment 25. The center hole portion includes a first filler layer 25a having one or more hollows and an inner plug wrapper (inner wrapping paper) 25b covering the filler layer. The center hole portion has a function of increasing the strength of the mouthpiece portion. The center hole portion does not necessarily have the inner plug wrapper 25b and may keep its shape by hot molding. The filter portion 20C may include the second segment 26. The second segment 26 includes the second filler layer 26a and an inner plug wrapper (inner wrapping paper) 26b covering the filler layer. The second filler layer 26a may be, for example, a rod that has an inside diameter of Ø5.0 to Ø1.0 mm and that is produced as follows: densely packing a cellulose acetate fiber, and adding a triacetin-containing plasticizer at 6 to 20% by weight mass% relative to the cellulose acetate weight, followed by curing. Since the second filler layer has a high fiber packing density, air or aerosol flows through only the hollow and hardly flows in the second filler layer during inhalation. Since the second filler layer inside the center hole portion is a fiber-packed layer, the touch feeling from outside during use is less likely to make users discomfortable.

[0076] The first filler layer 25a and the second filler layer 26a are connected to each other with an outer plug wrapper (outer wrapping paper) 27. The outer plug wrapper 27 may be, for example, paper having a cylindrical shape. The tobacco rod portion 20A, the cooling portion 20B, and the connected first and second filler layers 25a and 26a are connected to each other with a mouthpiece lining paper 28. These connections are established by, for example, applying vinyl acetate glue or other glues to the inner surface of the mouthpiece lining paper 28 and wrapping three members described above with the mouthpiece lining paper 28. These members may be connected to each other with multiple sheets of the lining paper in multiple times.

[0077] A combination of a non-combustion-heating-type tobacco flavor inhalation article and a heating device for generating aerosol is also referred to as a non-combustion-heating-type tobacco flavor inhalation system. Fig. 2 illustrates an example of the system. Referring to Fig. 2, the non-combustion-heating-type tobacco flavor inhalation system includes the non-combustion-heating-type tobacco flavor inhalation article 20 and a heating device 10 that heats the tobacco rod portion 20A from outside.

[0078] The heating device 10 includes a body 11, a heater 12, a metal tube 13, a battery unit 14, and a control unit 15. The body 11 has a cylindrical recess 16 and has the heater 12 and the metal tube 13 at positions corresponding to the tobacco rod portion 20A to be inserted into the cylindrical recess 16. The heater 12 may be a heater using electrical resistance, and electric power is supplied from the battery unit 14 upon instructions from the control unit 15, which performs temperature control, to heat the heater 12. The heat generated by the heater 12 is transferred to the tobacco rod portion 20A through the metal tube 13 having high thermal conductivity. Fig. 2 illustrates an aspect in which the heating device 10 heats the tobacco rod portion 20A from outside. However, the heating device 10 may heat the tobacco rod portion 20A from inside. The heating temperature of the heating device 10 is not limited, and preferably 400°C or less, more preferably 150°C to 400°C, still more preferably 200°C to 350°C. The heating temperature refers to the temperature of a heater of the heating device 10.

EXAMPLES

[Example A]

[0079] A papermaking tobacco sheet was prepared as the component (A). The sheet contained a tobacco material and 15 mass% vegetable glycerine as an aerosol-source material. A saturated fatty acid shown in Table 1 was prepared as the component (B) and sprayed on the sheet. The amount of the component (B) added per dry weight of the tobacco composition (the total weight of the papermaking tobacco sheet and the component (B)) is as shown in Table 1. For example, in Example A1, the amount of octanoic acid added per dry weight of the tobacco composition was 1.0 mass%.

[Table 1]

Example	Additive	Addition Amount mass%	Sensory Evaluation Results (Ave, n = 10) Score Difference from Comparative Example A (no addition) Regarding Discomfort
A1	octanoic acid	1.0	-21.0
A2	decanoic acid	1.2	-26.8
A3	myristic acid	1.0	-31.2
A4-1	palmitic acid	0.01	-31.0
A4-2	palmitic acid	0.1	-29.7
A4-3	palmitic acid	1.1	-41.2
A4-4	palmitic acid	1.9	-50.8
A4-5	palmitic acid	5.7	-54.9
A5	stearic acid	1.0	-17.6
A6	nonadecanoic acid	1.0	-25.9

[0080] After drying the sheet, multiple slits were provided, and the sheet was then rolled up into a tobacco rod. In this case, the longitudinal direction of the slits was parallel to the longitudinal direction of the tobacco segment. The tobacco rod was used to manufacture a non-combustion-heating-type tobacco flavor inhalation article having the structure shown in Fig. 3. The length of each segment was as described below.

Tobacco segment: 12 mm
Center hole portion: 8 mm
Paper tube: 20 mm
Acetate filter: 40 mm

[0081] The smoking test was carried out by heating the non-combustion-heating-type tobacco flavor inhalation article under the following conditions using a hollow cylindrical heater having an outside diameter of 3.2 mm and an inside diameter of 1.3 mm.

Voltage: applied voltage set to 3.0 V
Temperature profile: constant at 320°C
Preheating time (before start of smoking): heated for 30 seconds after inserting the heater to the rolled portion

[0082] Ten well-trained panelists carried out the test by using, as a reference, a non-combustion-heating-type tobacco flavor inhalation article (see Comparative Example A below) manufactured without addition of the component (B), in accordance with the Visual Analog Scale (Category Scale) method. The results are shown in Table 1. A smaller difference in score means less discomfort.

[Comparative Example A]

[0083] A non-combustion-heating-type tobacco flavor inhalation article was manufactured in the same method as in Example A except that the component (B) was not used.

[Example B]

[0084] The following materials were prepared.

Component (A): tobacco lamina (other than oriental species), tobacco lamina (oriental species)
Component (B): palmitic acid, sucrose palmitate
Other materials: licorice, liquid sugar, softwood pulp, glycerine, binder (guar gum)

[0085] A non-combustion-heating-type tobacco flavor inhalation article was manufactured in the following procedure and evaluated.

1) Tobacco lamina was ground in a lab mill to produce a tobacco fine powder with a raw material particle size D90 = 100 μm.
2) Palmitic acid granules and sucrose palmitate were ground into a powder in a lab mill.
3) Softwood pulp was pulverized in a lab mill.
4) These powdery materials were placed in a Ken mixer and mixed under stirring.
5) The liquid or paste materials, such as water, glycerine, licorice, liquid sugar, and a binder, were placed in a mixer or disperser (available from Primix) and mixed for 30 minutes.
6) The pulp was added to the resulting mixture and dispersed therein with a disperser (available from Primix) for 30 minutes.
7) The powder mixture prepared in 4) above was added to the dispersion in 6) and mixed with a disperser (available from Primix) for 30 minutes.
8) The mixture prepared in 7) above was cast on an iron plate.
9) The iron plate having the cast film formed thereon was placed in a forced-air dryer set at 80°C and dried for 30 minutes, and the cast film was then peeled from the iron plate to obtain a tobacco composition sheet. The sheet had a thickness of 150 μm and a basis weight of 150 g/m^2.
10) The tobacco composition sheet was shredded into shreds of the tobacco composition, 1 mm × 10 mm.
11) The shreds of the tobacco composition having a predetermined weight were wrapped up with wrapping paper into a size of Ø7 × 20 mm to manufacture a single roll.
12) The single roll was used as a tobacco rod to produce a non-combustion-heating-type tobacco flavor inhalation article shown in Fig. 2.
13) The non-combustion-heating-type tobacco flavor inhalation article was inserted into a heating device (Ploom S available from Japan Tobacco Inc.), heated, and subjected to smoking evaluation. The sensory evaluation was carried out by well-trained panelists. The evaluation results were shown in Table 2.

[Comparative Example B]

[0086] A non-combustion-heating-type tobacco flavor inhalation article was manufactured in the same method as in Example B except that the amount of each component mixed was changed as described in Table 2, and evaluated.

[Table 2]

	Composition of Tobacco Composition dry weight%									Sensory Evaluation Results
	A		B		Other Additives					
	Tobacco (other than oriental)	Tobacco (oriental)	Palmitic Acid	Sucrose Palmitate	Licorice	Liquid sugar	Pulp	Glycerine	Binder (guargum)	
Example B 1	75%	-	3%	3% -	-	-	5%	12%	5%	less discomfort than Comparative Example B1
Example B2	75%	-	-	3%	3% -	-	5%	12%	5%	less discomfort than Comparative Example B1
Example B3	72%	-	3%	3%	3% -	-	5%	12%	5%	less discomfort than Comparative Example B1
Example B4	72%	-	3%	3% -	3%	-	5%	12%	5%	
Example B5	70%	-	3%	3% -	-	5%	5%	12%	5%	
Example B6	72%	3%	3%	3% -	-	-	5%	12%	5%	
Example B7	67%	3%	3%	3% -	-	5%	5%	12%	5%	
Example B8	64%	3%	3%	3% -	3%	5%	5%	12%	5%	
Example B9	61%	3%	3%	3%	3%	5%	5%	12%	5%	
Comparative example B 1	78%	-	-	-	-	-	5%	12%	5%	reference
Comparative example B2	67%	4%	-	-	3%	5%	5%	12%	5%	
Comparative example B3	75%	-	-	-	3%	-	5%	12%	5%	
Comparative example B4	73%	-	-		-	5%	5%	12%	5%	
Comparative example B5	74%	4%	-	-	-	-	5%	12%	5%	
% = mass%										

[0087] The above description reveals that the tobacco preparation of the present invention reduces discomfort during smoking.

REFERENCE SIGNS LIST

[0088]

10	heating device
11	body
12	heater
13	metal tube
14	battery unit
15	control unit
16	recess
17	ventilation hole
20	non-combustion-heating-type flavor inhalation article
20A	tobacco rod portion
20B	cooling portion
20C	filter portion
21	tobacco filler
22	wrapping paper
23	paper tube
24	perforation
25	first segment
25a	first filler layer
25b	inner plug wrapper
26	second segment
26a	second filler layer
26b	inner plug wrapper
27	outer plug wrapper
28	lining paper

Claims

1. A tobacco composition comprising:

   (A) a tobacco material; and
   (B) a saturated fatty acid additive,
   wherein: the component (B) is selected from the group consisting of saturated fatty acids having a molar mass of 200 to 350 g/mol, esters of such saturated fatty acids, and combinations thereof; and
   the tobacco composition contains the component (B) at 0.01 to 3 mass% per dry weight in the composition.

2. The composition according to claim 1, wherein, in the component (B), the saturated fatty acids are a single substance and the esters of the saturated fatty acids are a single substance.

3. The composition according to claim 1 or 2, wherein the saturated fatty acids and the esters of the component (B) have a fatty acid moiety with 12 to 20 carbon atoms.

4. The composition according to any one of claims 1 to 3, further comprising a liquid sugar at 1 to 10 mass% per dry weight in the composition.

5. The composition according to any one of claims 1 to 4, wherein the component (A) contains a material derived from an oriental species at 10 mass% or less.

6. The composition according to any one of claims 1 to 5, further comprising a natural plant flavoring agent at 0.5 to 3 mass% per dry weight in the composition.

7. The composition according to any one of claims 1 to 6, comprising nicotine at 2 mass% or more per dry weight in the composition.

8. The composition according to any one of claims 1 to 6, comprising nicotine at 1.5 mass% or less per dry weight in the composition.

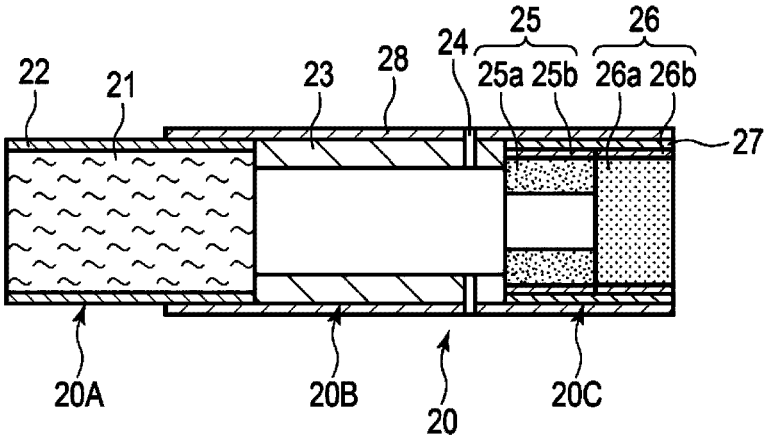
9. The composition according to any one of claims 1 to 8, further comprising an aerosol-source material at 12 mass% or less per dry weight in the composition.

10. A sheet formed from the tobacco composition according to any one of claims 1 to 9.

11. A method of manufacturing the tobacco composition according to any one of claims 1 to 10, the method comprising preparing a slurry by mixing the component (A), the component (B), which is partially or entirely powder, and a medium such that the powder is maintained in a powder state.

12. The manufacturing method according to claim 11, further comprising adjusting a viscosity of the slurry to 100,000 to 200,000 (mPa s).

Fig. 1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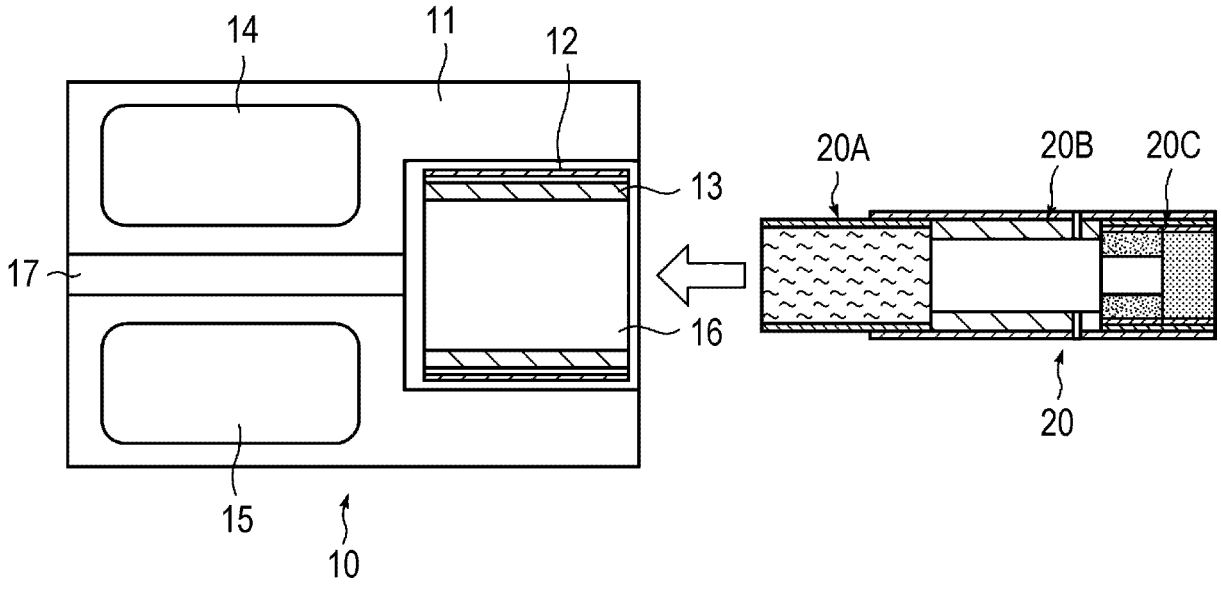
21
23
28
24
25
25a 25b
26
26a 26b
27
20A
20B
20
20C

Fig. 2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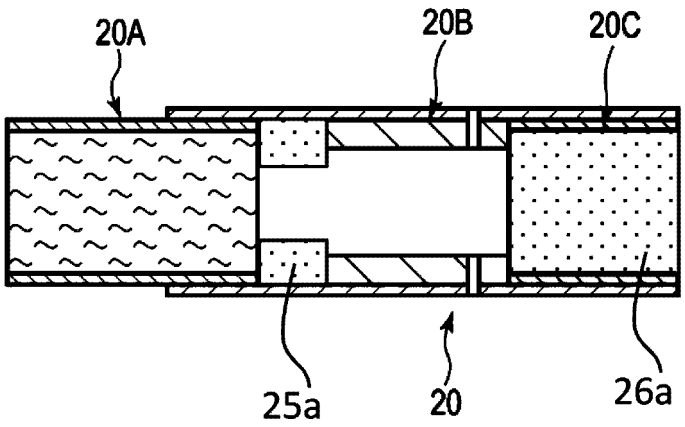
20A
20B
20C
20

Fig. 3



INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2022/014369

A. CLASSIFICATION OF SUBJECT MATTER

A24B 15/167(2020.01)i; ***A24B 15/32***(2006.01)i
FI: A24B15/167; A24B15/32

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A24B15/00-15/42; A24F40/00-47/00

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

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3729009 A (KIMBERLY CLARK CO) 24 April 1973 (1973-04-24) column 1, line 1 to column 8, line 14	1-3, 10
Y		4-9, 11-12
X	WO 2020/202254 A1 (JAPAN TOBACCO INC) 08 October 2020 (2020-10-08) in particular, paragraphs [0021]-[0036]	1-3, 9-10
Y		4-9, 11-12
Y	JP 2019-503659 A (BRITISH AMERICAN TOBACCO (INVESTMENTS) LIMITED) 14 February 2019 (2019-02-14) paragraphs [0023]-[0094]	4-9, 11-12
A	JP 9-262080 A (E R MIKI KK) 07 October 1997 (1997-10-07) paragraphs [0007]-[0024]	1-12

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

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
18 April 2022	**10 May 2022**

Name and mailing address of the ISA/JP	Authorized officer
Japan Patent Office (ISA/JP) **3-4-3 Kasumigaseki, Chiyoda-ku, Tokyo 100-8915** **Japan**	Telephone No.

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

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/JP2022/014369

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