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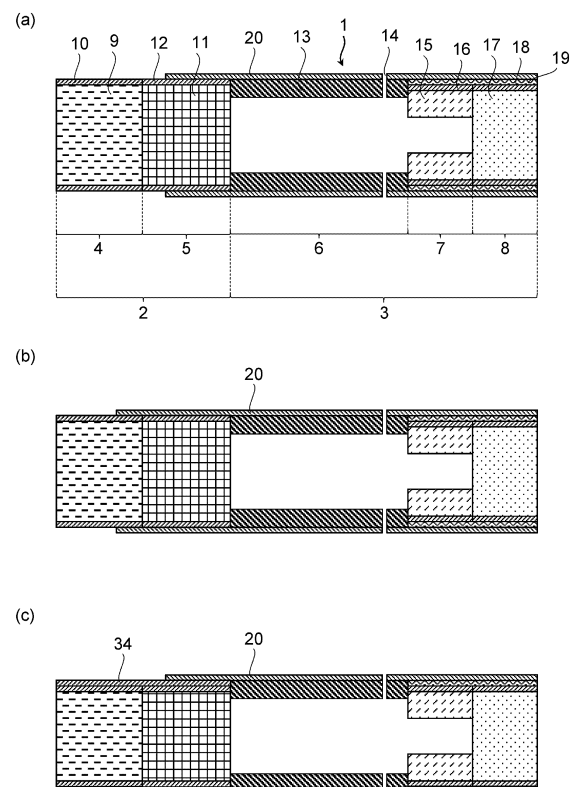
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(54) **NON-COMBUSTION-HEATING FLAVOR INHALATION ARTICLE AND
NON-COMBUSTION-HEATING FLAVOR INHALATION SYSTEM**

(57) Provided is a non-combustion-heating flavor inhalation article that achieves a uniform balance of each component supplied to a user from the beginning to the end of use. The non-combustion-heating flavor inhalation article includes an aerosol producing rod and a mouthpiece segment. The aerosol producing rod includes a first segment including an aerosol producing base material and a second segment including a flavor component. The mouthpiece segment includes a cooling segment and a filter segment.

Fig. 1



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Description

TECHNICAL FIELD

5 **[0001]** The present invention relates to a heat-not-burn flavor inhaling article and a heat-not-burn flavor inhaling system.

BACKGROUND ART

10 **[0002]** With a heat-burn flavor inhaling article (cigarette), a flavor is tasted by burning a tobacco rod containing a tobacco filler. A heat-not-burn flavor inhaling article with which a flavor is tasted not by burning a tobacco rod but by heating the tobacco rod is suggested as an alternative to the heat-burn flavor inhaling article. In a heat-not-burn flavor inhaling article, for example, a tobacco rod is electrically heated at 200°C to 400°C to volatilize a tobacco flavor component, and a user inhales the tobacco flavor component. A tobacco rod can be formed by wrapping a tobacco filler with a paper wrapper or the like into a circular columnar shape. A tobacco rod can be formed in a manner such that, for example, a
 15 dried tobacco plant (mainly, dry tobacco leaves) is crushed, mixed, and molded into a sheet shape with a thickness of 100 μm to 500 μm, then the molded product is shredded into a width of about 1 mm and a length of about 3 mm to about 10 mm, and the shreds are wrapped with a paper wrapper. Alternatively, a tobacco rod can be formed in a manner such that the molded product is not shredded but the sheet is crimped into a gathered state and wrapped with a paper wrapper. The moisture content of tobacco filler can be 10mass% to 15mass% that is an equilibrium moisture under an ordinary
 20 environment of dried tobacco itself. A tobacco filler may include various volatile flavoring agents in addition to a tobacco plant. Furthermore, a tobacco filler may include an aerosol-source material, such as glycerin and propylene glycol. An aerosol-source material volatilizes when a tobacco rod is heated, the volatilized material is cooled in a cooling segment disposed at a downstream part of the tobacco rod in a course in which a user inhales, to liquefy into an aerosol, and the aerosol is supplied into the mouth of the user. Since the aerosol is supplied to the user with a tobacco flavor component,
 25 the user is able to taste a sufficient flavor. A tobacco rod including a tobacco filler including such an aerosol-source material may also be referred to as aerosol-generating rod.

[0003] Examples of a heating system for a heat-not-burn flavor inhaling article, which electrically heats an aerosol-generating rod, include a system in which the outer periphery of the aerosol-generating rod is heated (for example, PTL 1) and a system in which the inside of the aerosol-generating rod is heated (for example, PTL 2). On the other hand,
 30 PTL 3 and PTL 4 describe an aerosol-generating rod having two segments as an aerosol-generating rod for a heat-not-burn flavor inhaling article.

CITATION LIST

35 PATENT LITERATURE

[0004]

PTL 1: Japanese Unexamined Patent Application Publication (Translation of PCT Application) No. 2019-523639
 40 PTL 2: Japanese Patent No. 6000451
 PTL 3: International Publication No. 2019/105750
 PTL 4: International Publication No. 2019/110747

SUMMARY OF INVENTION

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TECHNICAL PROBLEM

[0005] As described above, in both the heat-burn flavor inhaling article and the heat-not-burn flavor inhaling article, a tobacco rod (aerosol-generating rod) contains a large number of components having different vapor pressures and
 50 boiling points, such as a tobacco flavor component made up of many types of substances, a flavoring agent component, an aerosol-source material, and moisture.

[0006] Here, in the heat-burn flavor inhaling article, the distal end of the tobacco rod ignites, and a burning part (burning cone) burns and advances with use, so a portion to be heated is only a tobacco filler located just downstream of the burning part (burning cone) having about 800°C. Therefore, irrespective of whether the first half or second half of use,
 55 low boiling point components to high boiling point components are supplied to a user in a balanced manner at each timing of use.

[0007] On the other hand, in the heat-not-burn flavor inhaling article, heating generally continues over the entire aerosol-generating rod in the longitudinal direction, so components having a low boiling point (components having a

high vapor pressure), such as a tobacco flavor component, in the aerosol-generating rod complete their volatilization in the first half of use, and a majority of them is supplied to a user in the first half of use. On the other hand, components having a high boiling point (components having a low vapor pressure), such as an aerosol-source material, mainly begin to be supplied in the second half of use. In this way, low boiling point components are mainly supplied in the first half of use, and high boiling point components are mainly supplied in the second half of use, so a balance of components supplied to the user varies at each timing of use. For this reason, in the heat-not-burn flavor inhaling article, it is desired to provide a uniform balance of components supplied to a user over a period from the first half to the second half of use.

[0008] It is an object of the present invention to provide a heat-not-burn flavor inhaling article and a heat-not-burn flavor inhaling system that provide a uniform balance of components supplied to a user over a period from the first half to the second half of use.

SOLUTION TO PROBLEM

[0009] The present invention includes the following embodiments.

[1] In a heat-not-burn flavor inhaling article including an aerosol-generating rod and a mouthpiece segment,

the aerosol-generating rod includes a first segment including an aerosol-source material and a second segment including a flavor component, and

the mouthpiece segment includes a cooling segment and a filter segment.

[2] In the heat-not-burn flavor inhaling article according to [1], the aerosol-source material is at least one selected from the group consisting of glycerin, propylene glycol, and 1,3-butanediol.

[3] In the heat-not-burn flavor inhaling article according to [1] or [2], the first segment further includes plant fibers.

[4] In the heat-not-burn flavor inhaling article according to [3], the first segment includes a cylindrical wrapper and a nonwoven fabric made up of the plant fibers filling an inside of the wrapper, and the nonwoven fabric contains the aerosol-source material.

[5] In the heat-not-burn flavor inhaling article according to [4], multiple pieces of the sheet nonwoven fabric are stacked, and fill the inside of the wrapper in a state of being folded in an S-shape.

[6] In the heat-not-burn flavor inhaling article according to [4] or [5], the wrapper is a metal foil, a laminated sheet of metal foil and paper, a polymer film, a laminated sheet of polymer film and paper, or paper on a surface of which a coating agent selected from the group consisting of modified cellulose, modified starch, polyvinyl alcohol, and vinyl acetate is applied.

[7] In the heat-not-burn flavor inhaling article according to any one of [4] to [6], the wrapper is a laminated body of a paper layer forming an outer surface and a liquid impermeable layer forming an inner surface,

the liquid impermeable layer is made up of a layer of a metal foil, a polymer film, or a layer of a coating agent selected from the group consisting of modified cellulose, modified starch, polyvinyl alcohol, and vinyl acetate, and the wrapper is formed in a cylindrical shape in a manner such that the liquid impermeable layer of the wrapper is bonded at one end and the other end of the wrapper.

[8] In the heat-not-burn flavor inhaling article according to any one of [1] to [7], the first segment further contains a thickener.

[9] The heat-not-burn flavor inhaling article according to any one of [1] to [8], the flavor component contains a tobacco component.

[10] In the heat-not-burn flavor inhaling article according to [9], the second segment includes one or more tobacco materials selected from among a mesophyll, vein, stalk, flower, and root of a tobacco plant.

[11] In the heat-not-burn flavor inhaling article according to [10], the tobacco material contains a flavor developing agent.

[12] In the heat-not-burn flavor inhaling article according to [10], the tobacco material contains a lipid.

[13] In the heat-not-burn flavor inhaling article according to any one of [1] to [12], the second segment is disposed adjacent to the mouthpiece segment with respect to the first segment.

[14] In the heat-not-burn flavor inhaling article according to any one of [1] to [12], the columnar first segment is provided so as to extend in an axial direction of the aerosol-generating rod, and the second segment is disposed on an outer periphery of the first segment.

[15] In the heat-not-burn flavor inhaling article according to any one of [1] to [12], the columnar second segment is provided so as to extend in an axial direction of the aerosol-generating rod, and the first segment is disposed on an outer periphery of the second segment.

[16] In the heat-not-burn flavor inhaling article according to any one of [1] to [13], the first segment and the second segment are connected by being wrapped with an outer wrapper including a heat transfer raw material.

[17] A heat-not-burn flavor inhaling system includes

the heat-not-burn flavor inhaling article according to any one of [1] to [16], and
a heating device including a heater that heats the aerosol-generating rod of the heat-not-burn flavor inhaling article.

[18] In the heat-not-burn flavor inhaling system according to [17], the heater includes a first circumferential heater that heats an entire side of the columnar first segment and that heats part of a side of the columnar second segment or that does not heat the second segment.

[19] In the heat-not-burn flavor inhaling system according to [17], the heater includes a second circumferential heater that heats an entire side and entire bottom of the columnar first segment and that heats at least part of a side of the columnar second segment or that does not heat the second segment.

[20] In the heat-not-burn flavor inhaling system according to any one of [17] to [19], the heater includes an internal heater that heats an inside of the columnar first segment entirely in an axial direction and that heats an inside of the columnar second segment partially in an axial direction or that does not heat the second segment.

[21] In the heat-not-burn flavor inhaling system according to any one of [17] to [20], a heating temperature of the heater ranges from 200°C to 350°C.

ADVANTAGEOUS EFFECTS OF INVENTION

[0010] According to the present invention, it is possible to provide a heat-not-burn flavor inhaling article and a heat-not-burn flavor inhaling system that provide a uniform balance of components supplied to a user over a period from the first half to the second half of use.

BRIEF DESCRIPTION OF DRAWINGS

[0011]

[Fig. 1] Fig. 1 is a schematic diagram illustrating examples of a heat-not-burn flavor inhaling article according to a present embodiment.

[Fig. 2] Fig. 2 is a schematic diagram illustrating an example of a method of forming a first segment according to the present embodiment.

[Fig. 3] Fig. 3 is a schematic diagram illustrating an example of a method of bonding a wrapper of the first segment according to the present embodiment.

[Fig. 4] Fig. 4 is a schematic diagram illustrating another embodiment of an aerosol-generating rod according to the present embodiment.

[Fig. 5] Fig. 5 is a schematic diagram illustrating an example of a heat-not-burn flavor inhaling system according to the present embodiment.

[Fig. 6] Fig. 6 is a schematic diagram illustrating other examples of the configuration of a heater in the heat-not-burn flavor inhaling system according to the present embodiment.

DESCRIPTION OF EMBODIMENTS

[Heat-Not-Burn Flavor Inhaling Article]

[0012] A heat-not-burn flavor inhaling article according to the present embodiment includes an aerosol-generating rod and a mouthpiece segment. The aerosol-generating rod includes a first segment including an aerosol-source material and a second segment including a flavor component. The mouthpiece segment includes a cooling segment and a filter segment.

[0013] In the heat-not-burn flavor inhaling article according to the present embodiment, the aerosol-generating rod includes a first segment including an aerosol-source material and a second segment including a flavor component, such as a tobacco component. Therefore, when the aerosol-generating rod is heated, it is possible to increase the heating temperature of the first segment including an aerosol-source material having a high boiling point (low vapor pressure) and to decrease the heating temperature of the second segment including a flavor component having a low boiling point (high vapor pressure). Thus, it is possible to suppress volatilization of the flavor component having a low boiling point (high vapor pressure) in the first half of use and to maintain volatilization and supply of the flavor component up to the

second half of use. Furthermore, it is possible to facilitate volatilization of the aerosol-source material having a high boiling point (low vapor pressure) in the first half of use. Therefore, with the heat-not-burn flavor inhaling article according to the present embodiment, it is possible to provide a uniform balance of components supplied to a user over a period from the first half to the second half of use.

[0014] Fig. 1(a) is an example of the heat-not-burn flavor inhaling article according to the present embodiment. A heat-not-burn flavor inhaling article 1 illustrated in Fig. 1(a) includes an aerosol-generating rod 2 and a mouthpiece segment 3. The aerosol-generating rod 2 includes a first segment 4 including an aerosol-source material and a second segment 5 including a flavor component disposed downstream of the first segment 4. The mouthpiece segment 3 includes a cooling segment 6, a center hole segment 7, and a filter segment 8 from an upstream side in this order. In the present embodiment, the mouthpiece segment 3 does not need to include the center hole segment 7. During use, at least part (mainly the first segment 4) of the aerosol-generating rod 2 is heated, the aerosol-source material of the first segment 4 and the flavor component of the second segment 5 vaporize and are transferred to the mouthpiece segment 3 through inhalation, and inhalation is performed from the end of the filter segment 8.

(Aerosol-Generating Rod)

[0015] The aerosol-generating rod according to the present embodiment includes a first segment including an aerosol-source material and a second segment including a flavor component. The aerosol-generating rod according to the present embodiment may include a plurality of the first segments and/or a plurality of the second segments.

<First Segments

[0016] The first segment according to the present embodiment includes an aerosol-source material. Examples of the aerosol-source material include glycerin, propylene glycol, and 1,3-butanediol. One of them may be used or two or more of them may be used in combination.

[0017] The first segment preferably further includes plant fibers from the viewpoint of sufficiently holding an aerosol-source material. Examples of the plant fibers include wood pulp, hemp, corn, bamboo, cotton, and tobacco. One of them may be used or two or more of them may be used in combination. The plant fibers may be a plant fiber sheet made up of collected plant fibers. The plant fibers preferably contain 10mass% to 50mass% of aerosol-source material and more preferably contain 12mass% to 30mass% of aerosol-source material from the viewpoint that the aerosol-source material is stably held in a plant fiber sheet and a necessary amount of aerosol generated is ensured.

[0018] Preferably, the first segment includes a cylindrical wrapper and a nonwoven fabric made up of plant fibers filling an inside of the wrapper, and the nonwoven fabric contains an aerosol-source material. In the first segment, it is possible to sufficiently hold an aerosol-source material with a nonwoven fabric. The thickness of the nonwoven fabric is not limited and may, for example, range from 1 mm to 2 mm. The nonwoven fabric preferably contains 10mass% to 50mass% of the aerosol-source material and more preferably contains 12mass% to 30mass% of the aerosol-source material.

[0019] Preferably, the first segment includes a cylindrical wrapper and paper made up of plant fibers filling an inside of the wrapper, and the paper contains an aerosol-source material. In the first segment, it is possible to sufficiently hold an aerosol-source material with paper. The thickness of the paper is not limited and may, for example, range from 50 μm to 200 μm . The paper preferably contains 10mass% to 50mass% of the aerosol-source material and more preferably contains 12mass% to 30mass% of the aerosol-source material.

[0020] In the first segment, for example, as illustrated in Fig. 2(a), multiple pieces of sheet nonwoven fabric 21 are stacked and fill the inside of the wrapper in a state of being folded in an S-shape. With such a first segment, the nonwoven fabric is folded to fill the inside, so a gap between pieces of nonwoven fabric is not commonly visually recognized; however, when, for example, an internal heater having a blade shape, a rod shape, or the like is inserted, the heater enters the gap between pieces of nonwoven fabric, and there is no damage to the nonwoven fabric itself. Therefore, when the heater performs heating, it is possible to reduce a situation that the nonwoven fabric or the like chars to be brittle and remains in the device as wastes.

[0021] In the first segment, for example, as illustrated in Fig. 2(b), pieces of sheet paper 31 preferably fill the inside of the wrapper in a gathered state. With such a first segment, when, for example, an internal heater having a blade shape, a rod shape, or the like is inserted, the heater enters the gap between pieces of paper, and there is no damage to the paper itself. Therefore, when the heater performs heating, it is possible to reduce a situation that the paper or the like chars to be brittle and remains in the device as wastes. The nonwoven fabric may be filling the inside in a state of being folded in the S-shape but filling the inside in a gathered state. When filling the inside in a gathered state, a plurality of channels through which air easily permeates in a flow direction of air is formed, so it is possible to reduce the air-flow resistance of the first segment.

[0022] From the viewpoint of suppressing exudation of aerosol-source material, the wrapper is desirably the one with a reduced liquid permeability. Examples of the wrapper with a low liquid permeability include a metal foil, a laminated

sheet of a metal foil and paper, a polymer film, a laminated sheet of a polymer film and paper, and paper on a surface of which a coating agent that suppresses permeation of liquid, such as modified cellulose, modified starch, polyvinyl alcohol, and vinyl acetate, is applied. In addition to the viewpoint of suppressing permeation of liquid, from the viewpoint of providing a uniform temperature distribution in the longitudinal direction of the first segment, a wrapper preferably includes a metal foil having an excellent thermal conductivity. Furthermore, when a metal foil is disposed on an inner side and paper is disposed on an outer side after rod wrapping as a laminated sheet of a metal foil and paper, it is possible to assimilate the external appearance to a general heat-burn flavor inhaling article (cigarette). When the amount of aerosol-source material included in the first segment is relatively small, paper on the surface of which a coating agent that reduces permeation of liquid, such as modified cellulose, modified starch, polyvinyl alcohol, and vinyl acetate, is applied is preferably used in order to make it possible to assimilate the rod hardness, elasticity, and touch feeling of the first segment to a general heat-burn flavor inhaling article (cigarette).

[0023] When the wrapper is a laminated body of a paper layer forming an outer surface and a liquid impermeable layer forming an inner surface, the liquid impermeable layer may be made up of a layer of a metal foil, a polymer film, or a coating agent selected from the group consisting of modified cellulose, modified starch, polyvinyl alcohol, and vinyl acetate. Here, the wrapper is preferably formed in a cylindrical shape in a manner such that the liquid impermeable layer of the wrapper is bonded at one end and the other end of the wrapper. For example, as illustrated in Fig. 3, a nonwoven fabric 22 containing an aerosol-source material fills the inside of a cylindrical wrapper that is a laminated body of a paper layer 24 forming an outer surface and a liquid impermeable layer 23 forming an inner surface. Here, the wrapper is formed in a cylindrical shape in a manner such that the liquid impermeable layer 23 is bonded (bonding portion 25) at one end and the other end of the wrapper. When the liquid impermeable layer is bonded to each other in this way, it is possible to further suppress exudation of aerosol-source material to the outside.

[0024] The first segment preferably further contains a thickener from the viewpoint of improving retention of aerosol-source material. For example, an aerosol-source material, such as glycerin and propylene glycol, is liquid at ordinary temperature, so, when a large amount of aerosol-source material is contained in a nonwoven fabric or the like, the aerosol-source material may exudate from the nonwoven fabric. However, when a thickener is further contained in the nonwoven fabric or the like, it is possible to suppress exudation of aerosol-source material to the outside, so ease of handling improves. Examples of the thickener include polysaccharide thickeners, such as gellan gum, tamarind gum, agar, carageenan, pectin, and alginate, proteins, such as collagen and gelatin, and modified cellulose, such as HPC, CMC, and HPMC. One of these thickeners may be used or two or more of the thickeners may be used in combination. When the first segment contains a thickener, the content of the thickener preferably ranges from 0.1 parts by mass to 5.0 parts by mass with respect to 100 parts by mass of the aerosol-source material depending on the type of the thickener used. When, for example, glycerin is used as an aerosol-source material, native gellan gum is used as a thickener, and water is used as a diluent, the native gellan gum ranges from 0.3 parts by mass to 0.7 parts by mass and water is 23.5 parts by mass with respect to 100 parts by mass of glycerin. Thus, an aerosol-source material with a viscosity having an excellent retention, that is, a viscosity of 2000 to 26000 (mPa·s at 25°C) is obtained. The aerosol-source material is gel in a room temperature range and becomes liquid when warmed to about 60°C to 70°C. With this configuration, at the time of manufacturing the first segment, it is possible to easily contain an aerosol-source material by warming the aerosol-source material into a liquid state and applying the aerosol-source material to a nonwoven fabric or paper, and the aerosol-source material is in a gel state and stably held after the temperature decreases to about ordinary temperature.

[0025] The first segment may further include, for example, a tobacco component, a flavoring agent component (externally added flavoring agent) other than the tobacco component, or the like in addition to the aerosol-source material, the plant fibers (nonwoven fabric or paper), the wrapper, and the thickener. Examples of the flavoring agent component other than the tobacco component include L-menthol, liquorice root extract, reducing sugar, and cocoa extract. The first segment does not need to include a flavor component.

[0026] The axial length of the first segment is not limited and may, for example, range from 5 mm to 15 mm. The circumferential length of the first segment is not limited and may, for example, range from 15 mm to 24 mm.

<Second Segment>

[0027] The second segment according to the present embodiment includes a flavor component. Examples of the flavor component include a tobacco component, such as one obtained by drying a tobacco plant, a tobacco extract, and one obtained by condensing or fractionating a tobacco extract, and a flavoring agent component other than the tobacco component. When the second segment includes a tobacco component, the second segment can include one or more tobacco materials selected from among a mesophyll, vein, stalk, flower, and root of a tobacco plant. A tobacco material can be a tobacco sheet (described later). The second segment may include, for example, a cylindrical wrapper and the tobacco material filling the inside of the wrapper.

[0028] The tobacco material may contain a flavor developing agent. The flavor developing agent may contain at least one of carbonates, hydrogencarbonates, oxides, and hydroxides of alkali metals and/or alkaline earth metals. Preferably,

the flavor developing agent is potassium carbonate or sodium carbonate. Since most of the tobacco component contained in the tobacco material is amines, when the tobacco material contains a flavor developing agent, volatilization of the tobacco component is ensured even at a relatively low temperature, so it is possible to sufficiently develop a tobacco flavor. The amount of the flavor developing agent contained in the tobacco material preferably ranges from 5 parts by mass to 20 parts by mass with respect to 100 parts by mass of the tobacco material. The pH of the tobacco material may be 7 to 11 as a result of adding a flavor developing agent. The pH can be measured with a pH meter (for example, IQ240 made by IQ Scientific Instruments, Inc.). For example, distilled water ten times as heavy as 2 g to 10 g of tobacco material in mass ratio is added to the tobacco material, a mixture of water and the tobacco material is shaken at 200 rpm for ten minutes at room temperature (for example, 22°C) and left standing for five minutes, and then the pH of the obtained extract is measured with the pH meter.

[0029] The tobacco material may contain lipid. Examples of the lipid include acylglycerols, such as monoglyceride, diglyceride, and triglyceride, and fatty acids. One of them may be used or two or more of them may be used in combination. When the tobacco material contains lipid, it is possible to reduce redundant volatilization of flavor component, such as nicotine, due to interaction between the lipid and the flavor component, such as nicotine, contained in the tobacco material. When the tobacco material contains lipid, a small amount of lipid can also be contained in an aerosol generated during use. With this configuration, it is possible to suppress re-vaporization of a flavor component after vapor of the flavor component and the aerosol-source material is cooled and an aerosol is formed. The amount of lipid contained in the tobacco material preferably ranges from 2 parts by mass to 15 parts by mass with respect to 100 parts by mass of the tobacco material.

[0030] Examples of the second segment may include the one in which shreds (strands) obtained by shredding tobacco leaves fill the inside of a cylindrical wrapper randomly, the one in which tobacco sheet shreds obtained by shredding the tobacco sheet fill the inside of a cylindrical wrapper randomly or in an aligned orientation, and the one in which the tobacco sheet is gathered without being shredded and fills the inside of the cylindrical wrapper. Hereinafter, shreds obtained by shredding tobacco leaves and tobacco sheet shreds are collectively referred to as tobacco shreds. Examples of the wrapper include the one obtained by forming a wrapping paper into a cylindrical shape. The content of nicotine in the filler filling the inside of the wrapper is preferably higher than or equal to 1.5mass% and more preferably ranges from 2.0mass% to 4.0mass%. When the packing density of tobacco shreds filling the inside of the wrapper ranges from 0.2 mg/mm³ to 0.7 mg/mm³, generation of a sufficient flavor component during use is ensured, and a sufficient rod hardness of the second segment is ensured, so it is preferable.

[0031] The size of tobacco shreds and its preparation method are not limited. In an example, the aged tobacco leaves are shredded into a shape with a width of greater than or equal to 0.5 mm and less than or equal to 2.0 mm and a length of greater than or equal to 3 mm and less than or equal to 10 mm. Tobacco shreds with such a size are preferable to fill an object to be filled. In another example, the processed tobacco leaves may be shredded (strand-type shreds) with a width of greater than or equal to 0.5 mm and less than or equal to 2.0 mm and a length of greater than that of the above-described tobacco shreds and preferably a length equivalent to that of an object to be filled. The strand-type shreds preferably use a tobacco sheet from the viewpoint of ease of molding.

[0032] The moisture content of tobacco shreds may be higher than or equal to 10mass% and lower than or equal to 15mass% with respect to the total mass of tobacco shreds and preferably higher than or equal to 11mass% and lower than or equal to 13mass%. With such a moisture content, occurrence of wrapping stains is reduced after tobacco shreds fill an object to be filled.

[0033] A tobacco sheet is the one obtained by molding a composition including aged tobacco leaves and the like into a sheet shape. Aged tobacco leaves used for a tobacco sheet are not limited. Examples of the aged tobacco leaves include the one stripped and separated into laminae and leaf midribs. In the specification, "sheet" means a shape having a pair of substantially parallel principal surfaces and a side surface.

[0034] A tobacco sheet may be molded with a known method, such as sheet making, casting, and rolling. Various tobacco sheets molded by such methods are disclosed in details in "Tobacco Dictionary, Tobacco Academic Studies Center, 2009.3.31".

[0035] Examples of a method of molding a tobacco sheet by sheet making may include a method including the following steps.

- (1) a step of extracting a water-soluble component from aged tobacco leaves by roughly crushing aged tobacco leaves and mixing and stirring the aged tobacco leaves with a solvent, such as water.
- (2) a step of separating the water-soluble component into water extract and residue.
- (3) a step of decompressing and drying the water extract to condense the water extract.
- (4) a step of obtaining a mixture by adding pulp to the residue and then fiberizing the material with a refiner (homogenization step).
- (5) a step of making a sheet from a mixture of residue and pulp, fiberized.
- (6) a step of providing a tobacco sheet by adding a condensed solution of water extract to the sheet made and

drying the sheet.

[0036] When a tobacco sheet is molded with this method, a step of removing part of components, such as nitrosoamine, may be added (see Japanese Unexamined Patent Application Publication (Translation of PCT Application) No. 2004-510422). An aerosol-source material can be contained in a tobacco sheet used for a heat-not-burn flavor inhaling article. When a tobacco sheet is manufactured by sheet making, a condensed solution of water extract and an aerosol-source material may be mixed and added in the step (6) or an aerosol-source material may be added subsequently to the step (6).

[0037] Examples of a method of molding a tobacco sheet by slurry process may include a method including the following steps.

(1) a step of obtaining a mixture by mixing water, pulp, binder, and a ground product of aged tobacco (homogenization step).

(2) a step of thinly extending (casting) the mixture and drying the mixture to obtain a tobacco sheet.

[0038] When a tobacco sheet is molded with this method, a step of removing part of components, such as nitrosoamine, by applying ultraviolet irradiation or X-ray irradiation to slurry obtained by mixing water, pulp, binder, and ground tobacco leaves may be added. An aerosol-source material can be contained in a tobacco sheet used for a heat-not-burn flavor inhaling article. When a tobacco sheet is manufactured by slurry process, an aerosol-source material may be mixed into the mixture of (1) or an aerosol-source material may be sprayed to be added to a dried sheet after step (2).

[0039] Examples of a method of molding a tobacco sheet by rolling may include a method including the following steps.

(1) a step of obtaining a mixture by mixing water, pulp, binder, and a ground product of aged tobacco (homogenization step).

(2) a step of obtaining a rolled molding product by putting the mixture into a plurality of rolling rolls.

(3) a step of peeling the rolled molding product on the rolling rolls with a doctor knife, conveying the rolled molding product to a wire mesh chain conveyor, and drying the rolled molding product with a drying machine.

[0040] When the tobacco sheet is molded with this method, the surface of each of the rolling rolls may be heated or cooled or the rotation speed of each of the rolling rolls may be adjusted, according to a purpose. Furthermore, it is possible to obtain a tobacco sheet with a desired basis weight by adjusting the space between the rolling rolls. An aerosol-source material can be contained in a tobacco sheet used for a heat-not-burn flavor inhaling article. When a tobacco sheet is manufactured by rolling, an aerosol-source material may be mixed into the mixture of (1) or an aerosol-source material may be sprayed to be added to the mixture of (1) or an aerosol-source material may be sprayed to be added to a dried sheet after step (3).

[0041] Other than the above molding methods, with a method including the following steps, described in International Publication No. 2014/104078, a nonwoven fabric tobacco sheet can be molded.

(1) a step of obtaining a mixture by mixing a ground product of aged tobacco and a binder (homogenization step).

(2) a step of sandwiching the mixture by a nonwoven fabric.

(3) a step of obtaining a nonwoven fabric tobacco sheet by molding the laminate into a certain shape by thermal welding.

[0042] When an aerosol-source material is contained in a nonwoven fabric tobacco sheet, an aerosol-source material may be sprayed to be applied after (3).

[0043] In the homogenization step described in the methods, from the viewpoint of obtaining a tobacco sheet having a certain strength, preferably, the mean fiber length of tobacco fibers contained in each mixture is greater than or equal to 200 μm and less than or equal to 1000 μm , and the freeness of each mixture is higher than or equal to 20°SR and lower than or equal to 50°SR. The mean fiber length of tobacco fibers is measured by an automatic optical analysis (JIS P8226-2) by using unpolarized light at a fiber count of 20,000 or more. The freeness is measured by a Schopper-Riegler method (JIS P8121).

[0044] The length and width of the tobacco sheet are not limited and may be adjusted as needed according to a mode for filling an object to be filled (described later). The thickness of the tobacco sheet is not limited and is preferably greater than or equal to 150 μm and less than or equal to 1000 μm and more preferably greater than or equal to 200 μm and less than or equal to 600 μm due to balance between heat transfer and strength.

[0045] The composition of the tobacco sheet is not limited. For example, the content of aged tobacco leaves is preferably higher than or equal to 50mass% and lower than or equal to 95mass% with respect to the total mass of the tobacco sheet. The tobacco sheet may contain a binder. Examples of the binder include guar gum, xanthan gum, CMC (car-

boxymethyl cellulose), and CMC-Na (sodium salt of carboxymethyl cellulose). The content of the binder is preferably higher than or equal to 1mass% and lower than or equal to 20mass% with respect to the total mass of the tobacco sheet. The tobacco sheet may further contain other additives. Examples of the other additives include a filler, such as pulp. The content of the filler is not limited and is preferably higher than or equal to 1mass% and lower than or equal to 20mass% with respect to the total mass of the tobacco sheet. Here, a water extract residue of aged tobacco, which is an intermediate product when a tobacco sheet is molded by sheet making, differs from a filler.

[0046] The packing density of the tobacco material in the wrapper can be set as needed according to the form of the tobacco material used, an intended flavor, an air-flow resistance, and the like. For example, the packing density may be greater than or equal to 0.2 mg/mm³ and less than or equal to 0.7 mg/mm³. The packing density is calculated by the percentage of the mass of the tobacco material to the internal volume of the rod formed by the wrapper.

[0047] The axial length of the second segment is not limited and may, for example, range from 5 mm to 15 mm. The circumferential length of the second segment is not limited and may, for example, range from 15 mm to 24 mm.

<Configuration of Aerosol-Generating Rod>

[0048] The configuration of the aerosol-generating rod is not limited as long as the aerosol-generating rod includes the first segment and the second segment; however, the second segment is preferably disposed adjacent to the mouthpiece segment (on the downstream side) with respect to the first segment. For example, as illustrated in Fig. 1(a), the columnar second segment 5 can be disposed adjacent to the mouthpiece segment 3 (on the downstream side) with respect to the columnar first segment 4. In Fig. 1(a), the first segment 4 can be configured such that a nonwoven fabric 9 made up of plant fibers and containing an aerosol-source material fills the inside of a first wrapper 10. The second segment 5 can be configured such that the tobacco material 11 fills the inside of a second wrapper 12. Ease of volatilization of the components contained in the first segment and the second segment mainly depends on the heating temperature, and volatilization of the components is facilitated when a substance highly compatible with volatilizing components is present around. With the configuration, an aerosol-source material volatilized in the first segment is cooled to liquefy (aerosolize) at the instance when flowing into the second segment during inhalation, and dissolves a flavor component (for example, nicotine) in the second segment into the aerosol to carry the aerosol to outside the aerosol-generating rod. Thus, the concentration of the flavor component in the second segment decreases, and volatilization is facilitated. Thus, even when the temperature of the second segment is not increased so much, release efficiency is ensured. Therefore, each time of puff action at a low temperature, the flavor component can be released from the second segment, with the result that it is possible to suppress exhaustion of the flavor component. The ratio (A/B) of the length (A) of the first segment to the length (B) of the second segment in the axial direction of the aerosol-generating rod preferably ranges from 0.3 to 3.0 and more preferably ranges from 0.5 to 2.0.

[0049] The first segment and the second segment can be connected by being wrapped with an outer wrapper. Here, the outer wrapper may be a general paper wrapper; however, the outer wrapper preferably contains a heat transfer raw material. When the first segment and the second segment are wrapped with the outer wrapper containing a heat transfer raw material, heat of the circumferential heater can be uniformly and efficiently transferred to the second segment even when, for example, only the side of the first segment is heated by the heater. Examples of the heat transfer raw material include a metal foil having a higher heat conductivity than paper. Particularly, as is represented by an aluminum foil and a stainless steel foil, a metal foil having a heat conductivity higher than or equal to 10 W/m·K, low in cost, resistant to corrosion, and high working characteristics (a thickness of several micrometers to 10 μm, high tensile strength, and easy to bend) is preferably used. For reference, the heat conductivities of typical metal foils (alloy foils) are shown in Table 1.

[Table 1]

RAW MATERIAL	HEAT CONDUCTIVITY (W/m·K)
TITANIUM FOIL	21.9
STAINLESS STEEL FOIL	16.3
NICKEL FOIL	90.7
42 ALLOY FOIL	14.6
COPPER FOIL	390
BERYLLIUM FOIL	120
MOLYBDENUM FOIL	138

(continued)

RAW MATERIAL	HEAT CONDUCTIVITY (W/m·K)
BRASS FOIL	84
NIOBIUM FOIL	53.7
TANTALUM FOIL	57.5
ZINC FOIL	11.6
ALUMINUM FOIL	236
TIN FOIL	66.6
SILVER FOIL	420
KOVAR FOIL	13.7-19.7
IRON FOIL	84
ZIRCONIUM FOIL	22.7
LEAD FOIL	34
INDIUM FOIL	81.6
GOLD FOIL	320
PLATINUM FOIL	70
PAPER	0.06
WRAPPING PAPER FOR TOBACCO	0.3-0.4

[0050] The columnar first segment may be provided so as to extend in the axial direction of the aerosol-generating rod, and the second segment may be disposed on the outer periphery of the first segment. For example, as illustrated in Fig. 4(a), the second segment 5 can be disposed on the outer periphery of (the side of) the columnar first segment 4. With this configuration, heating can be performed by inserting an internal heater, such as a blade heater, to the first segment. In the configuration, since the first segment heated at a higher temperature is formed in a thin rolled shape, it is preferable in terms that the first segment can be efficiently heated at a high temperature with an internal heater. Ease of flow of air in the longitudinal direction of the circular columnar rod during inhalation is set so as to be higher in the second segment than in the first segment by adjusting the packing density of each of the fillers. Thus, an aerosol-source material mainly generated from the first segment does not directly move toward a mouthpiece but an aerosol-source material mainly generated from the first segment can move to the second segment, associate with a flavor component, and move to a mouthpiece portion. In this case, an interface between the first segment and the second segment is preferably made of a permeable wrapper, for example, paper having an air permeability of 1000 to 30000 CORESTA Unit, so that air and an aerosol can permeate. Even when a member like a wrapper is not present at the interface, it is preferable from the viewpoint of facilitating movement of gas components from the first segment to the second segment.

[0051] The columnar second segment may be provided so as to extend in the axial direction of the aerosol-generating rod, and the second segment may be disposed on the outer periphery of the first segment. For example, as illustrated in Fig. 4(b), the first segment 4 can be disposed on the outer periphery of (the side of) the columnar second segment 5. With such a configuration, the side of the first segment can be heated with a circumferential heater. In the configuration, it is preferable in terms that the first segment intended to be heated at a higher temperature is efficiently heated at a high temperature with an external heater. Ease of flow of air in the longitudinal direction of the circular columnar rod during inhalation is set so as to be higher in the second segment than in the first segment by adjusting the packing density of each of the fillers. Thus, an aerosol-source material mainly generated from the first segment does not directly move toward a mouthpiece but an aerosol-source material mainly generated from the first segment can move to the second segment, associate with a flavor component, and move to a mouthpiece portion. In this case, an interface between the first segment and the second segment is preferably made of a permeable wrapper, for example, paper having an air permeability of 1000 to 30000 CORESTA Unit, so that air and an aerosol can permeate. Even when a member like a wrapper is not present at the interface, it is preferable from the viewpoint of facilitating movement of gas components from the first segment to the second segment.

[0052] The axial length of the aerosol-generating rod is not limited and may, for example, range from 12 mm to 50 mm. The circumferential length of the aerosol-generating rod is not limited and may, for example, range from 15 mm to

24 mm.

(Mouthpiece Segment)

5 **[0053]** The mouthpiece segment according to the present embodiment includes a cooling segment and a filter segment. The mouthpiece segment according to the present embodiment includes a plurality of cooling segments and/or a plurality of filter segments. The mouthpiece segment according to the present embodiment may include another segment in addition to the cooling segment and the filter segment. Examples of another segment include a center hole segment.

10 <Cooling Segments

[0054] As illustrated in Fig. 1(a), a mode in which the cooling segment 6 is made up of a cylindrical member 13 can be provided. The cylindrical member 13 may be, for example, a paper core formed by working thick paper into a cylindrical shape.

15 **[0055]** The cooling segment is located downstream of the aerosol-generating rod. Functions sought for the cooling segment are to cool vapor of a flavor component and an aerosol-source material to liquefy (aerosolize) while suppressing a reduction of vapor of the flavor component and aerosol-source material, generated in the aerosol-generating rod during use, due to filtration or adsorption as much as possible. For example, a difference between a segment internal temperature at a cooling segment inlet and a segment internal temperature at a cooling segment outlet during inhalation can be greater than or equal to 20°C. When a high-temperature vapor component of a flavor component and an aerosol-source material pass through a cellulose acetate fiber filling segment used as a filter member of a general heat-burn flavor inhaling article, a temperature difference between a segment inlet and a segment outlet can be greater than or equal to 20°C; however, a large amount of vapor of a flavor component and an aerosol-source material reduces due to filtration and adsorption at the time of passing through a fiber filling layer. The fiber filling layer is not referred to as cooling segment in this application.

25 **[0056]** One mode of the cooling segment may be a hollow tube obtained by working single paper or laminated paper of multiple pieces of sheet into a cylindrical shape. The material of the tube may be a substance obtained by corrugating cellulose acetate fibers into a sheet shape or a plastic film, such as polyolefin and polyester, other than the paper. To increase a cooling effect by bringing outside air at room temperature into contact with high-temperature vapor, a hole for introducing outside air is preferably provided around the tube. When polymer coating of polyvinyl alcohol or the like or polysaccharide coating of pectin or the like is provided on the inner surface of the tube, it is possible to increase a cooling effect by taking advantage of heat of dissolution resulting from absorption of heat or phase change of coating. The air-flow resistance of the cylindrical cooling segment is 0 mmHzO.

30 **[0057]** Another mode of the cooling segment is to preferably fill the inside of a tube worked into a cylindrical shape, with a cooling sheet member. At this time, when one or multiple airflow channels are provided in a flow direction, it is possible to perform cooling with the cooling sheet and achieve removal of components at the time of passing through a low-level segment. The air-flow resistance of the cooling segment filled with the cooling sheet desirably ranges from 0 mmH₂O to 30 mmH₂O. The air-flow resistance (RTD) is a pressure needed to push air through the overall length of an object under a test of a flow rate of 17.5 ml/s at 22°C and 101 kPa (760 torr). RTD is commonly expressed by the unit of mmHzO and is measured in accordance with ISO 6565: 2011. In the mode in which the cooling sheet fills inside as well, a hole for introducing outside air can be provided in a tube member.

35 **[0058]** The total surface area of a cooling sheet member may be higher than or equal to 300 mm²/mm and lower than or equal to 1000 mm²/mm. The surface area is a surface area per length (mm) of the cooling sheet member in a ventilation direction. The total surface area of the cooling sheet member is preferably greater than or equal to 400 mm²/mm and more preferably greater than or equal to 450 mm²/mm, while the total surface area of the cooling sheet member is preferably less than or equal to 600 mm²/mm and more preferably less than or equal to 550 mm²/mm.

40 **[0059]** The cooling sheet member desirably has a large surface area from the viewpoint of cooling function. The air-flow resistance of the cooling segment filled with the cooling sheet member is desirably lower from the viewpoint of reducing removal of a flavor component and an aerosol-source material due to filtration or adsorption. Therefore, in a preferred embodiment, a sheet for cooling may be provided with ridges and grooves to form channels in a flow direction and then may be made up of a sheet of a thin material, pleated, gathered, or folded.

45 **[0060]** In some embodiments, the thickness of a constituent material of the cooling sheet member may be greater than or equal to 5 μm and less than or equal to 500 μm and may be, for example, greater than or equal to 10 μm and less than or equal to 250 μm.

50 **[0061]** The material of the cooling sheet member may be a sheet material, such as a metal foil, a polymer sheet, and paper with a low air permeability. In one embodiment, the cooling segment may contain a sheet material selected from the group consisting of polyethylene, polypropylene, polyvinyl chloride, polyethylene terephthalate, polylactate, cellulose acetate, and aluminum foil.

[0062] Paper is desirably used as the material of the cooling sheet member from the viewpoint of reducing an environmental load. Paper used for the cooling sheet member desirably has a basis weight of 30 g/m² to 100 g/m² and a thickness of 20 μm to 100 μm. The air permeability of paper to be used as a material for a cooling sheet is desirably lower and the air permeability is preferably lower than or equal to 10 CORESTA Unit from the viewpoint of reducing removal of the flavor component and the aerosol-source material in the cooling segment. When polymer coating of polyvinyl alcohol or the like or polysaccharide coating of pectin or the like is provided on the paper serving as a cooling sheet member, it is possible to increase a cooling effect by taking advantage of heat of dissolution resulting from absorption of heat or phase change of coating.

[0063] In Fig. 1(a), the cylindrical member 13 and a mouthpiece lining paper 20 (described later) have perforations 14 extending through both members. With the presence of the perforations 14, outside air is introduced into the cooling segment 6 during inhalation. Thus, an aerosol vaporized component generated by heating the aerosol-generating rod 2 contacts with outside air, and the temperature of the aerosol vaporized component decreases, so the aerosol vaporized component liquefies to form an aerosol. The diameter (span length) of each perforation 14 is not limited and may be, for example, greater than or equal to 0.5 mm and less than or equal to 1.5 mm. The number of the perforations 14 is not limited and may be one or two or more. For example, a plurality of the perforations 14 may be provided along the circumference of the cooling segment 6.

[0064] The amount of outside air introduced through the perforations 14 is preferably lower than or equal to 85vol% with respect to the volume of the entire gas inhaled by a user and more preferably lower than or equal to 80vol%. When the percentage of the amount of outside air is lower than or equal to 85vol%, it is possible to sufficiently suppress a reduction in flavor resulting from dilution with outside air. This also called ventilation in other words. A lower limit of the range of ventilation percentage is preferably higher than or equal to 55vol% and more preferably higher than or equal to 60vol% from the viewpoint of cooling capability.

[0065] In some embodiments, the generated aerosol can decrease by a temperature of 10°C or more when the aerosol is inhaled by a user through the cooling segment. In another mode, the temperature can decrease by 15°C or more.

Further in another mode, the temperature can decrease by 20°C or more.

[0066] The cooling segment can be formed in a rod shape of which the axial length is, for example, greater than or equal to 7 mm and less than or equal to 30 mm. For example, the axial length of the cooling segment may be 20 mm.

[0067] In some embodiments, the cooling segment has substantially a circular shape as a sectional shape in the axial direction, the circumferential length preferably ranges from 16 mm to 25 mm, more preferably ranges from 20 mm to 24 mm, and further preferably ranges from 21 mm to 23 mm.

<Center Hole Segment>

[0068] The center hole segment is made up of a filling layer having one or multiple hollow portions and an inner plug wrapper (inner wrapping paper) covering the filling layer. For example, as illustrated in Fig. 1(a), the center hole segment 7 is made up of a second filling layer 15 having a hollow portion, and a second inner plug wrapper 16 covering the second filling layer 15. The center hole segment 7 has a function to enhance the strength of the mouthpiece segment 3. The second filling layer 15 may be, for example, a rod with an inside diameter of greater than or equal to φ1.0 mm and less than or equal to φ5.0 mm, filled with cellulose acetate fibers with a high density and added with a plasticizer containing triacetin at 6mass% or higher and 20mass% or lower with respect to the mass of cellulose acetate and cured. Since the second filling layer 15 has a high packing density of fibers, air and aerosol flow through only the hollow portion and almost do not flow through the second filling layer 15 during inhalation. Since the second filling layer 15 in the center hole segment 7 is a fiber filling layer, a touch feeling from outside during use is less likely to make a user feel a sense of discomfort. The center hole segment 7 may be held in shape by heat molding without the second inner plug wrapper 16.

<Filter Segment>

[0069] The configuration of the filter segment is not limited and may be made up of one or multiple filling layers. For example, as illustrated in Fig. 1(a), in the filter segment 8, the outside of the first filling layer 17 may be wrapped with a first inner plug wrapper 18 (inner wrapping paper). An air-flow resistance per segment of the filter segment may be changed as needed by the amount, material, or the like of a filler filling the filter segment. When, for example, the filler is cellulose acetate fibers, it is possible to increase the air-flow resistance when the amount of cellulose acetate fibers filling the filter segment is increased. When the filler is cellulose acetate fibers, the packing density of cellulose acetate fibers may range from 0.13 g/cm³ to 0.18 g/cm³. At the same packing density as well, the thickness of cellulose acetate fibers used is preferably greater to develop a low air-flow resistance. The thickness of one of cellulose acetate fibers preferably ranges from five denier/filament to 20 denier/filament. Furthermore, from the viewpoint of high-speed manufacturing of the filter segment, the thickness further preferably ranges from seven denier/filament to 13 denier/filament. The air-flow resistance is a value measured with an air-flow resistance measuring device (product name: SODIMAX

made by SODIM).

[0070] The circumferential length of the filter segment is not limited and preferably ranges from 16 mm to 25 mm, more preferably ranges from 20 mm to 24 mm, and further preferably ranges from 21 mm to 23 mm. The axial length of the filter segment can be selected within the range of 5 mm to 20 mm and is selected such that the air-flow resistance ranges from 10 mmH₂O/seg to 60 mmH₂O/seg. The axial length of the filter segment preferably ranges from 5 mm to 9 mm and more preferably ranges from 6 mm to 8 mm. The sectional shape of the filter segment is not limited and may be, for example, a circular shape, an elliptical shape, a polygonal shape, or the like. The filter segment may be directly added with a breakable capsule containing a flavoring agent, a flavor bead, or a flavoring agent.

[0071] As illustrated in Fig. 1(a), the center hole segment 7 and the filter segment 8 can be connected by an outer plug wrapper (outer wrapping paper) 19. The outer plug wrapper 19 may be, for example, a cylindrical paper. The aerosol-generating rod 2, the cooling segment 6, and the connected center hole segment 7 and filter segment 8 can be connected by the mouthpiece lining paper 20. These connections can be made by, for example, applying a paste, such as vinyl acetate paste, on the inner surface of the mouthpiece lining paper 20 and rolling the mouthpiece lining paper 20 with the three segments placed inside. These segments may be connected in multiple steps with multiple pieces of lining paper. As illustrated in Fig. 1(b), the first segment 4 may be fixed by the mouthpiece lining paper 20. As illustrated in Fig. 1(c), after the first segment 4 and the second segment 5 are connected by an outer wrapper 34, the aerosol-generating rod 2, the cooling segment 6, and the connected center hole segment 7 and filter segment 8 may be connected by the mouthpiece lining paper 20.

(Configuration of Heat-Not-Burn Flavor Inhaling Article)

[0072] The axial length of the heat-not-burn flavor inhaling article according to the present embodiment is not limited and is preferably greater than or equal to 40 mm and less than or equal to 90 mm, more preferably greater than or equal to 50 mm and less than or equal to 75 mm, and further preferably greater than or equal to 50 mm and less than or equal to 60 mm. The circumferential length of the heat-not-burn flavor inhaling article is preferably greater than or equal to 16 mm and less than or equal to 25 mm, more preferably greater than or equal to 20 mm and less than or equal to 24 mm, further preferably greater than or equal to 21 mm and less than or equal to 23 mm. For example, there may be a mode in which the length of the aerosol-generating rod is 20 mm, the length of the cooling segment is 20 mm, the length of the center hole segment is 8 mm, and the length of the filter segment is 7 mm. The length of the filter segment can be selected within the range greater than or equal to 4 mm and less than or equal to 20 mm. A selection is made such that the air-flow resistance of the filter segment at that time is greater than or equal to 10 mmH₂O/seg and less than or equal to 60 mmH₂O/seg. The lengths of these individual segments may be changed as needed according to manufacturing suitability, quality requirements, and the like. Furthermore, even when only the filter segment is disposed downstream of the cooling segment without using the center hole segment, it can also function as a heat-not-burn flavor inhaling article.

[Heat-Not-Burn Flavor Inhaling System]

[0073] A heat-not-burn flavor inhaling system according to the present embodiment includes the heat-not-burn flavor inhaling article according to the present embodiment, and a heating device including a heater that heats the aerosol-generating rod of the heat-not-burn flavor inhaling article. Since the heat-not-burn flavor inhaling system according to the present embodiment includes the heat-not-burn flavor inhaling article according to the present embodiment, a balance of components supplied to a user is uniform over a first half to a second half of use. The heat-not-burn flavor inhaling system according to the present embodiment may include another component in addition to the heat-not-burn flavor inhaling article according to the present embodiment and the heating device.

[0074] Fig. 5 is an example of the heat-not-burn flavor inhaling system according to the present embodiment. The heat-not-burn flavor inhaling system illustrated in Fig. 5 includes the heat-not-burn flavor inhaling article 1 according to the present embodiment, and a heating device 27 that heats the aerosol-generating rod of the heat-not-burn flavor inhaling article 1 from outside. Fig. 5(a) illustrates a state before the heat-not-burn flavor inhaling article 1 is inserted in the heating device 27. Fig. 5(b) illustrates a state where the heat-not-burn flavor inhaling article 1 is inserted in the heating device 27 and heated. The heating device 27 illustrated in Fig. 5 includes a body 28, a heater 29, a metal tube 30, a battery unit 31, and a control unit 32. The body 28 has a cylindrical recess 33. The heater 29 and the metal tube 30 are disposed on the inner side of the recess 33 at a location corresponding to the aerosol-generating rod (mainly, the first segment) of the heat-not-burn flavor inhaling article 1 inserted in the recess 33. The heater 29 may be an electrical resistance heater. Electric power is supplied from the battery unit 31 in response to instructions from the control unit 32 that executes temperature control, and the heater 29 performs heating. Heat emitted from the heater 29 is transferred to the aerosol-generating rod (mainly, the first segment) of the heat-not-burn flavor inhaling article 1 through the metal tube 30 having a high heat conductivity.

[0075] Since Fig. 5(b) shows a schematic diagram, there is a gap between the outer periphery of the heat-not-burn

flavor inhaling article 1 and the inner periphery of the metal tube 30. Actually, it is desirable that there is no gap between the outer periphery of the heat-not-burn flavor inhaling article 1 and the inner periphery of the metal tube 30 for the purpose of efficiently transferring heat. The heating device 27 heats the aerosol-generating rod (mainly, the first segment) of the heat-not-burn flavor inhaling article 1 from outside. Alternatively, the heating device 27 may heat the aerosol-generating rod from inside. When the heating device 27 heats the aerosol-generating rod from inside, a plate-shaped, blade-shaped or columnar heater having stiffness is preferably used without using the metal tube 30. Examples of the heater include a ceramic heater in which molybdenum, tungsten, or the like is applied onto a ceramic substrate.

[0076] In the heat-not-burn flavor inhaling system according to the present embodiment, the heater preferably includes a first circumferential heater that heats an entire side of the columnar first segment and that heats part of a side of the columnar second segment or that does not heat the second segment. With this configuration, the heating temperature of the first segment including an aerosol-source material having a high boiling point (low vapor pressure) is increased, and the heating temperature of the second segment including a flavor component having a low boiling point (high vapor pressure) is decreased, so a uniform balance of components supplied to a user over a first half to a second half of use can be provided. The first circumferential heater can heat the entire side of the columnar first segment and heat part of the side of the columnar second segment as in the case of, for example, the heater 29 illustrated in Fig. 5. In Fig. 5, the heater 29 heats part of the side of the second segment; however, the heater 29 does not need to heat the second segment. In this case, the second segment is heated by heat transfer or residual heat from the first segment.

[0077] In the heat-not-burn flavor inhaling system according to the present embodiment, the heater preferably includes a second circumferential heater that heats an entire side and entire bottom of the columnar first segment and that heats at least part of a side of the columnar second segment or that does not heat the second segment. With such a configuration, as in the case of the above embodiment, it is possible to provide a uniform balance of components supplied to a user over a period from the first half to the second half of use. The second circumferential heater can heat the entire side and entire bottom of the columnar first segment and heat the side of the columnar second segment as in the case of, for example, the heater 29 illustrated in Fig. 6(a). In Fig. 6(a), the heater 29 heats the side of the second segment; however, the heater 29 does not need to heat the second segment. In this case, the second segment is heated by heat transfer or residual heat from the first segment.

[0078] In another heat-not-burn flavor inhaling system according to the present embodiment, the heater preferably includes an internal heater that heats an inside of the columnar first segment entirely in an axial direction and that heats an inside of the columnar second segment partially in an axial direction or that does not heat the second segment. With such a configuration, as in the case of the above embodiment, it is possible to provide a uniform balance of components supplied to a user over a period from the first half to the second half of use. The internal heater may heat the inside of the columnar first segment entirely in an axial direction and does not need to heat the columnar second segment as in the case of, for example, the heater 29 illustrated in Fig. 6(b). In Fig. 6(b), the heater 29 does not heat the second segment, but the heater 29 may heat the inside of the second segment partially in the axial direction.

[0079] In another heat-not-burn flavor inhaling system according to the present embodiment, a heater may be a combination of the first or second circumferential heater and the internal heater. The heater may be a combination of a circumferential heater that heats an entire side of the columnar first segment and an entire side of the columnar second segments, and an internal heater that heats an inside of the columnar first segment entirely in an axial direction and does not heat the columnar second segment, as in the case of, for example, the heater 29 illustrated in Fig. 6(c).

[0080] The heating temperature of the heater preferably ranges from 200°C to 350°C. The heating temperature represents the temperature of the heater.

Claims

1. A heat-not-burn flavor inhaling article comprising an aerosol-generating rod and a mouthpiece segment, wherein
 - the aerosol-generating rod includes a first segment including an aerosol-source material and a second segment including a flavor component, and
 - the mouthpiece segment includes a cooling segment and a filter segment.
2. The heat-not-burn flavor inhaling article according to claim 1, wherein the aerosol-source material is at least one selected from the group consisting of glycerin, propylene glycol, and 1,3-butanediol.
3. The heat-not-burn flavor inhaling article according to claim 1 or 2, wherein the first segment further includes plant fibers.
4. The heat-not-burn flavor inhaling article according to claim 3, wherein the first segment includes a cylindrical wrapper

and a nonwoven fabric made up of the plant fibers filling an inside of the wrapper, and the nonwoven fabric contains the aerosol-source material.

5 5. The heat-not-burn flavor inhaling article according to claim 4, wherein multiple pieces of the sheet nonwoven fabric are stacked, and fill the inside of the wrapper in a state of being folded in an S-shape.

10 6. The heat-not-burn flavor inhaling article according to claim 4 or 5, wherein the wrapper is a metal foil, a laminated sheet of metal foil and paper, a polymer film, a laminated sheet of polymer film and paper, or paper on a surface of which a coating agent selected from the group consisting of modified cellulose, modified starch, polyvinyl alcohol, and vinyl acetate is applied.

7. The heat-not-burn flavor inhaling article according to any one of claims 4 to 6, wherein

15 the wrapper is a laminated body of a paper layer forming an outer surface and a liquid impermeable layer forming an inner surface,
the liquid impermeable layer is made up of a layer of a metal foil, a polymer film, or a layer of a coating agent selected from the group consisting of modified cellulose, modified starch, polyvinyl alcohol, and vinyl acetate, and the wrapper is formed in a cylindrical shape in a manner such that the liquid impermeable layer of the wrapper is bonded at one end and the other end of the wrapper.

20 8. The heat-not-burn flavor inhaling article according to any one of claims 1 to 7, wherein the first segment further contains a thickener.

25 9. The heat-not-burn flavor inhaling article according to any one of claims 1 to 8, wherein the flavor component contains a tobacco component.

10. The heat-not-burn flavor inhaling article according to claim 9, wherein the second segment includes one or more tobacco materials selected from among a mesophyll, vein, stalk, flower, and root of a tobacco plant.

30 11. The heat-not-burn flavor inhaling article according to claim 10, wherein the tobacco material contains a flavor developing agent.

12. The heat-not-burn flavor inhaling article according to claim 10, wherein the tobacco material contains a lipid.

35 13. The heat-not-burn flavor inhaling article according to any one of claims 1 to 12, wherein the second segment is disposed adjacent to the mouthpiece segment with respect to the first segment.

40 14. The heat-not-burn flavor inhaling article according to any one of claims 1 to 12, wherein the columnar first segment is provided so as to extend in an axial direction of the aerosol-generating rod, and the second segment is disposed on an outer periphery of the first segment.

45 15. The heat-not-burn flavor inhaling article according to any one of claims 1 to 12, wherein the columnar second segment is provided so as to extend in an axial direction of the aerosol-generating rod, and the first segment is disposed on an outer periphery of the second segment.

16. The heat-not-burn flavor inhaling article according to any one of claims 1 to 13, wherein the first segment and the second segment are connected by being wrapped with an outer wrapper including a heat transfer raw material.

50 17. A heat-not-burn flavor inhaling system comprising:

the heat-not-burn flavor inhaling article according to any one of claims 1 to 16; and
a heating device including a heater that heats the aerosol-generating rod of the heat-not-burn flavor inhaling article.

55 18. The heat-not-burn flavor inhaling system according to claim 17, wherein the heater includes a first circumferential heater that heats an entire side of the columnar first segment and that heats part of a side of the columnar second segment or that does not heat the second segment.

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19. The heat-not-burn flavor inhaling system according to claim 17, wherein the heater includes a second circumferential heater that heats an entire side and entire bottom of the columnar first segment and that heats at least part of a side of the columnar second segment or that does not heat the second segment.

20. The heat-not-burn flavor inhaling system according to any one of claims 17 to 19, wherein the heater includes an internal heater that heats an inside of the columnar first segment entirely in an axial direction and that heats an inside of the columnar second segment partially in an axial direction or that does not heat the second segment.

21. The heat-not-burn flavor inhaling system according to any one of claims 17 to 20, wherein a heating temperature of the heater ranges from 200°C to 350°C.

Fig. 1

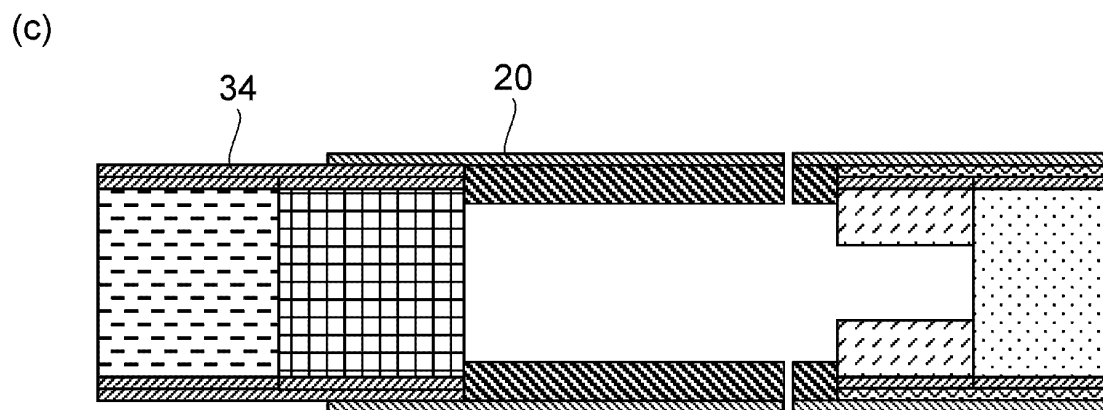
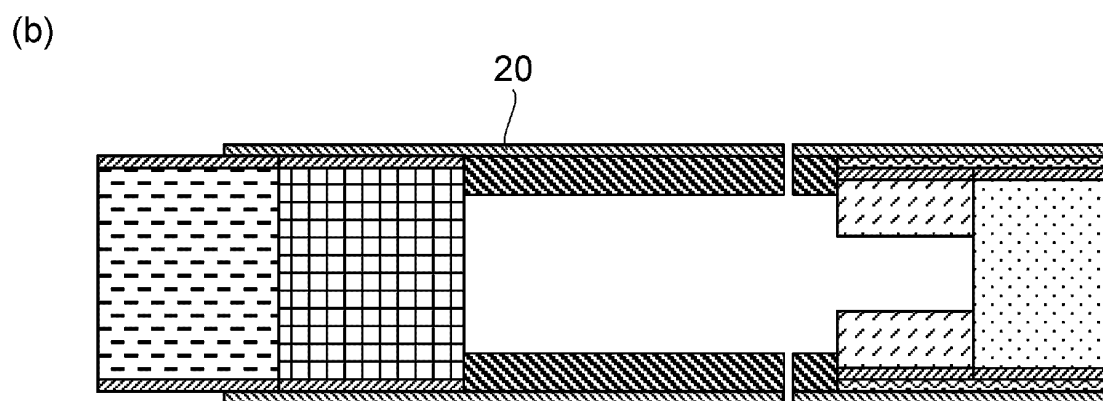
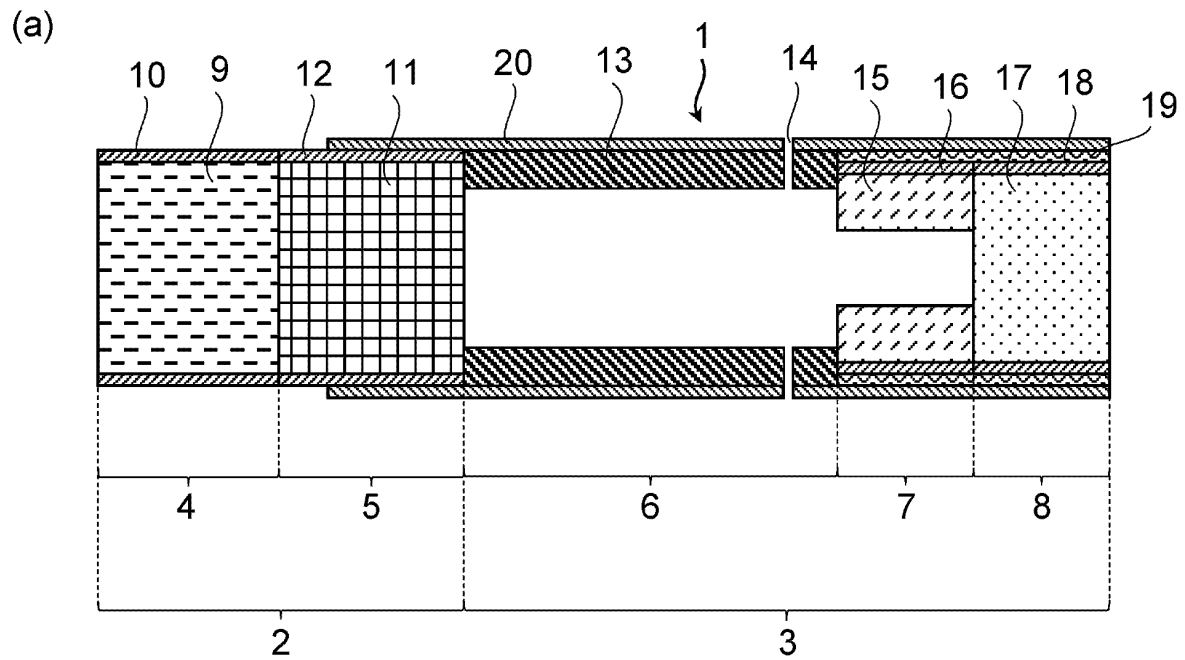


Fig. 2

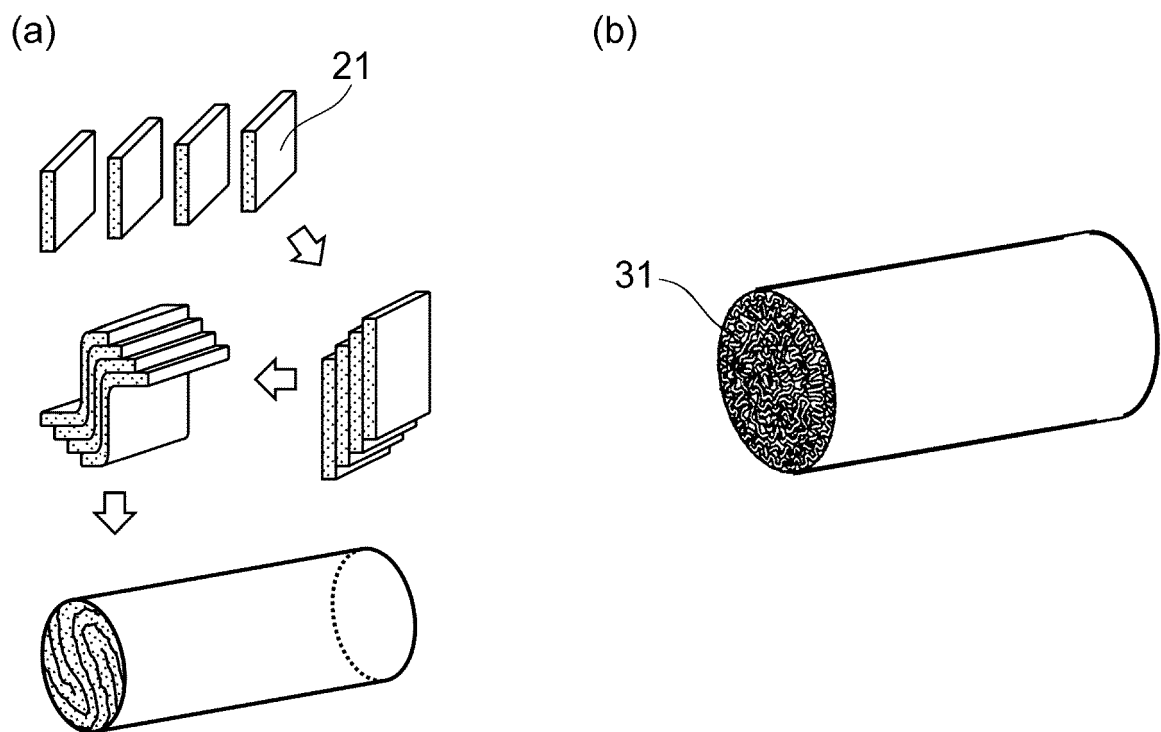


Fig. 3

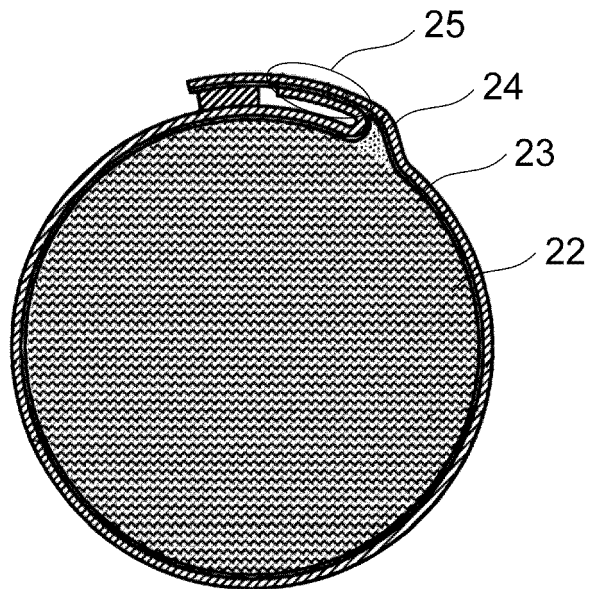
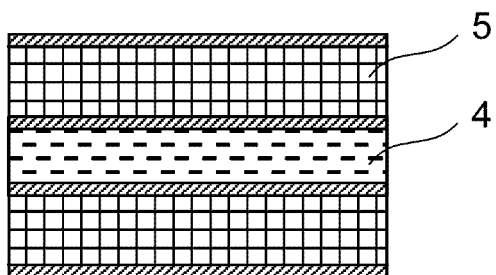


Fig. 4

(a)



(b)

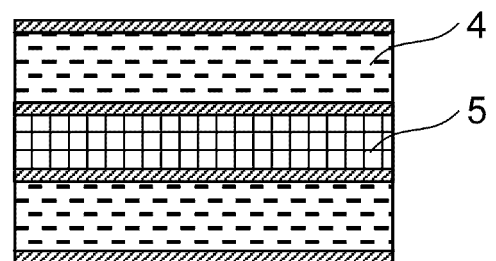


Fig. 5

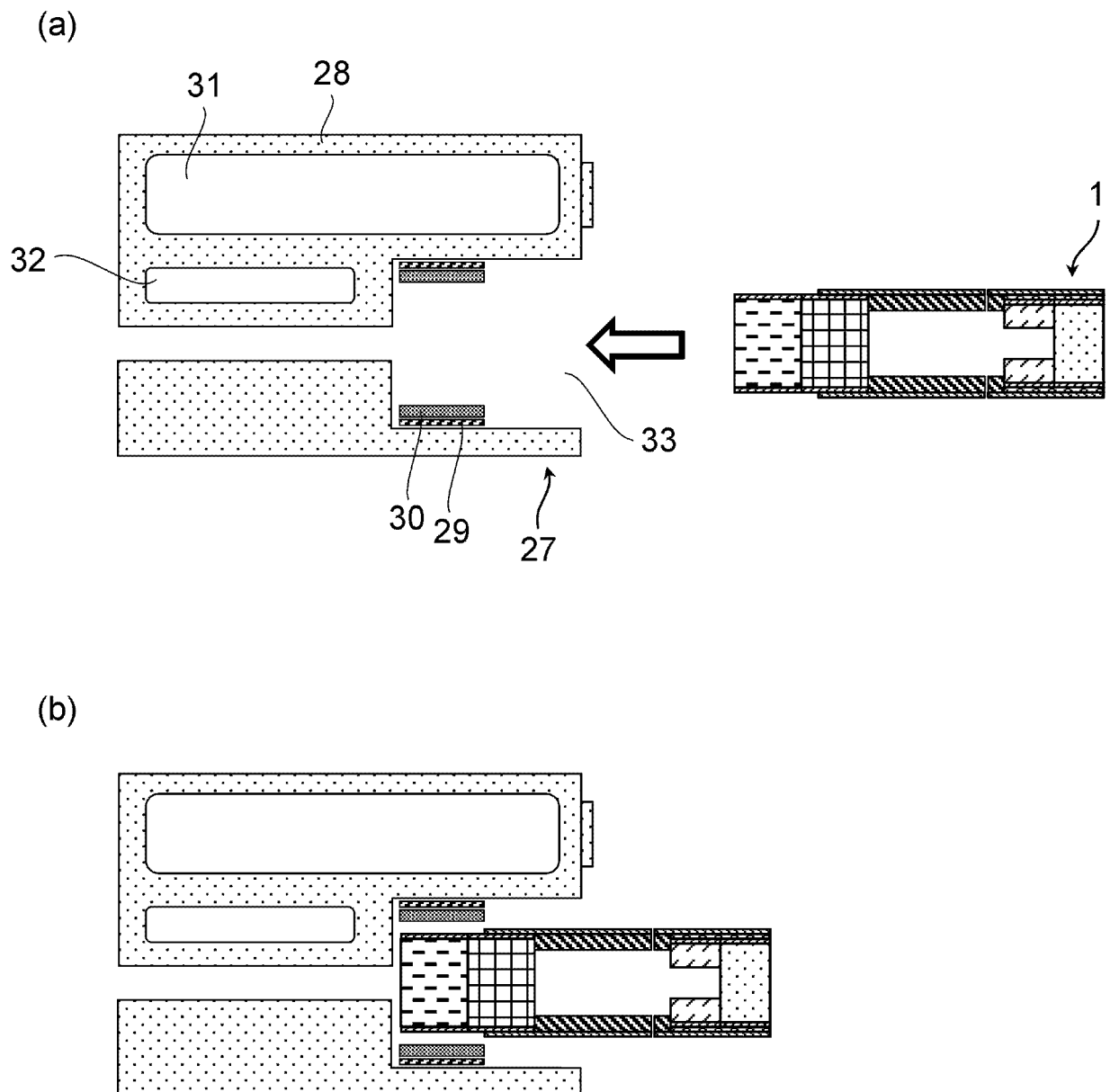
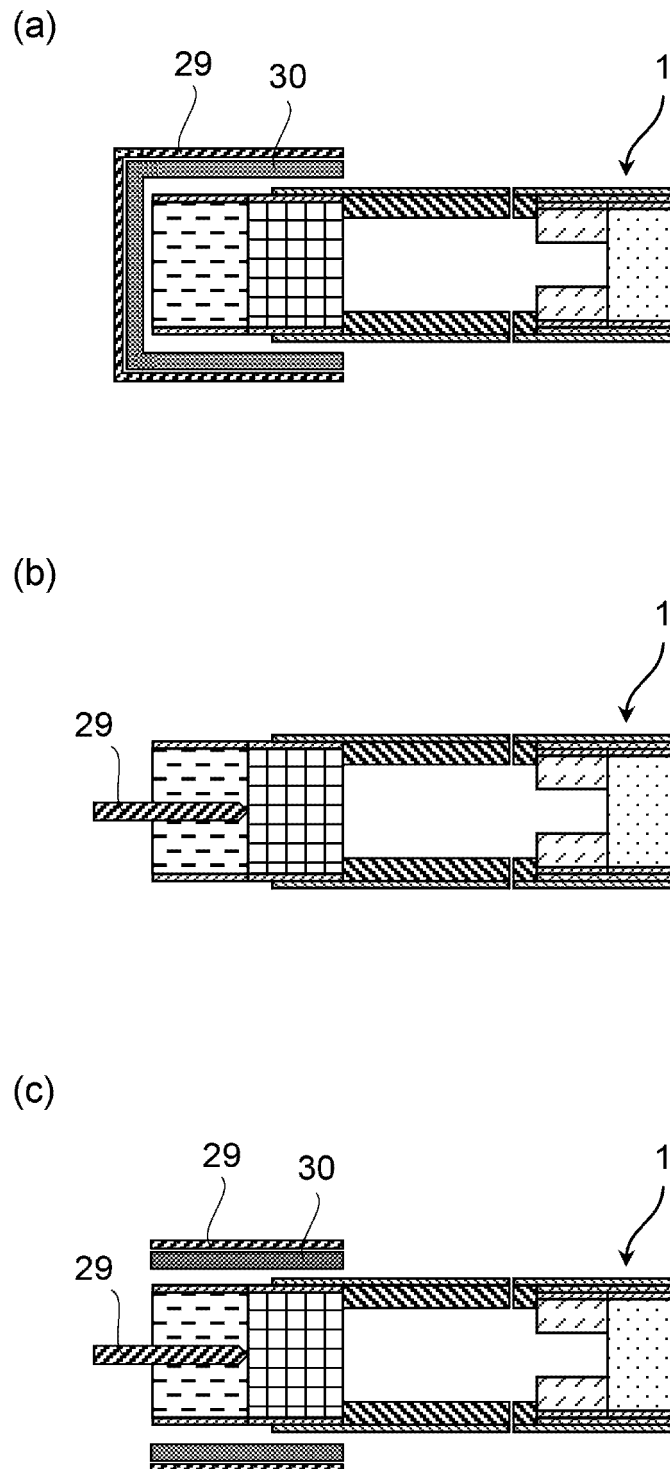


Fig. 6



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2021/018192

A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl. A24D1/20(2020.01)i, A24F40/30(2020.01)i

FI: A24F40/30, A24D1/20

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Int.Cl. A24D1/20, A24F40/30

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

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2020/0359688 A1 (KT&G CORPORATION) 19 November 2020 (2020-11-19), paragraphs [0031]-[0093], fig. 1-5	1-2, 9-10, 13, 17 3-8, 11-12, 15-16, 18-21
X	WO 2020/089071 A1 (NERUDIA LIMITED) 07 May 2020 (2020-05-07), page 3, line 9 to page 13, line 29, fig. 1-5	1-2, 9-10, 13-14, 17 3-8, 11-12, 15-16, 18-21
Y	JP 2020-74714 A (MIZUGUCHI, Kakushi) 21 May 2020 (2020-05-21), paragraph [0011]	3-8, 11-12, 15-16, 18-21
Y	WO 2019/189523 A1 (TOA IND CO., LTD.) 03 October 2019 (2019-10-03), paragraphs [0021]-[0026], [0056]-[0060], [0081]-[0084], fig. 4	5-8, 11-12, 15-16, 18-21



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

01 July 2021

Date of mailing of the international search report

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Name and mailing address of the ISA/

Japan Patent Office

3-4-3, Kasumigaseki, Chiyoda-ku,

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Authorized officer

Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2021/018192

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 2013-532953 A (JAPAN TOBACCO INC.) 22 August 2013 (2013-08-22), paragraphs [0048], [0049]	11, 15-16, 18-21
Y	WO 2021/085532 A1 (JAPAN TOBACCO INC.) 06 May 2021 (2021-05-06), paragraph [0011]	12, 15-16, 18-21
Y	JP 2018-512142 A (BRITISH AMERICAN TOBACCO (INVESTMENTS) LIMITED) 17 May 2018 (2018-05-17), paragraphs [0084]-[0096], [0126], fig. 3, 4	15-16, 18-21
Y	JP 2016-531586 A (PHILIP MORRIS PRODUCTS S.A.) 13 October 2016 (2016-10-13), paragraphs [0152]-[0164], fig. 1	18-21

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

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/JP2021/018192

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	WO 2020/089071 A1	07 May 2020	GB 201817541 D
10	JP 2020-74714 A	21 May 2020	(Family: none)
	WO 2019/189523 A1	03 October 2019	(Family: none)
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	JP 2018-512142 A	17 May 2018	US 2018/0338520 A1 paragraphs [0092]-[0104], [0125], fig. 3, 4 WO 2016/156510 A2 EP 3277114 A2 CN 107427088 A
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REFERENCES CITED IN THE DESCRIPTION

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