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(54) NON-COMBUSTION-HEATING FLAVOR INHALING ARTICLE AND ELECTRIC-HEATING FLAVOR INHALING SYSTEM

GESCHMACKSINHALATIONSARTIKEL OHNE VERBRENNUNG UND GESCHMACKSINHALATIONSSYSTEM MIT ELEKTRISCHER HEIZUNG

ARTICLE D'INHALATION D'ARÔME À CHAUFFAGE SANS COMBUSTION ET SYSTÈME D'INHALATION D'ARÔME À CHAUFFAGE ÉLECTRIQUE

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Description

FIELD

[0001] The present invention relates generally to a non-combustible-heating flavor inhaling article free from combustion and an electric-heating flavor inhaling system.

BACKGROUND

[0002] In a wrapper for rolling tobacco rag in a cylindrical shape, a wrapper in which occurrence of stains is suppressed is known. It is considered that stains that occur on tobacco rolling papers are caused by exudation of a substance included in tobacco rag during storage. A flavor made contained in tobacco rag is an example of a major composition that causes stains on tobacco rolling paper. JP 6333409 discloses a cigarette wrapping paper for wrapping shredded tobacco. US 2007/246055 A1 discloses a cigarette wrapping material having an aqueous coating formulation applied thereto. WO 2014/087529 A1 discloses a cigarette having inner and outer papers, both coated with a combustion aid to prevent the cigarette from going out. US 4407308 A discloses a cigarette having an air permeability of less than 3 Coresta units.

SUMMARY

[0003] In recent years, a non-combustible-heating flavor inhaling article free from combustion has been very useful from the perspective of odor reduction and has been rapidly accepted in a tobacco market. On the other hand, the heating temperature of a non-combustible-heating flavor inhaling article is much lower (30 °C to 400 °C) than the combustion temperature of a traditional cigarette (700 °C to 900 °C). In some cases, this creates a problem wherein if the same amount of flavor as that in a traditional cigarette is contained in cut tobacco a user may not sense a sufficient strength of the flavor. For this reason, with this new type of flavor inhaling article (non-combustible-heating flavor inhaling article), it is necessary to have a larger amount of flavor contained in cut tobacco than in a traditional cigarette so that a smoker can obtain a refreshing sensation (aroma and taste) at the same level as a traditional cigarette. Accordingly, due to an increased amount of flavor, more stains are caused on a wrapper of the non-combustible-heating flavor inhaling article than in a traditional cigarette.

[0004] An object of the present invention is to provide a non-combustible-heating flavor inhaling article in which stains caused on a wrapper enclosing a tobacco filler are reduced.

[0005] According to an aspect of the present invention, there is provided a non-combustion-heating flavor inhaling article according to claim 1.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006]

FIG. 1 is a cross-sectional schematic diagram showing an electric-heating flavor inhaling system according to an embodiment.

FIG. 2 is a cross-sectional schematic diagram showing an enlarged rod of the electric-heating flavor inhaling system shown in FIG. 1.

FIG. 3 is a cross-sectional view showing a wrapper and a tobacco filler along line F3-F3 of a tobacco part in the rod shown in FIG. 2.

FIG. 4 is a cross-sectional view of one end of the wrapper, an other end of the wrapper, and an adhered surface between the one end and the other end, along line F4-F4 in the rod shown in FIG. 2.

FIG. 5 is a cross-sectional schematic diagram illustrating a process of inserting the rod into a main body of the electric-heating flavor inhaling system shown in FIG. 1.

FIG. 6 is a cross-sectional view showing a first modification of the wrapper and the tobacco filler along line F3-F3 of the tobacco part of the rod shown in FIG. 2.

FIG. 7 is a cross-sectional view showing a second modification of a wrapper and a tobacco filler along line F3-F3 of a tobacco part in the rod shown in FIG. 2.

FIG. 8 is a cross-sectional schematic diagram showing a rod of an electric-heating flavor inhaling system according to a second embodiment.

FIG. 9 is a table showing measurement values of examples and comparative examples.

DETAILED DESCRIPTION

[0007] Hereinafter, an embodiment of an electric-heating flavor inhaling system will be described with reference to FIG. 1 to FIG. 5. The drawings schematically show each component of the invention. Thus, the dimensions on the drawings may not always match the dimensions of actual products.

[First Embodiment]

[0008] As shown in FIG. 1, unlike traditional paper-rolled tobacco (cigarettes), the electric-heating flavor inhaling system 11 is of a heating type that electrically heats the tobacco filler 23 without combustion, allowing the smoke aroma of tobacco to be tasted.

[0009] The electric-heating flavor inhaling system 11 includes a main body 12 and a rod 14 (non-combustible-heating flavor inhaling article) configured to be detached from and attached to an insertion part 13 of the main body 12.

[0010] The main body 12 includes a box-shaped housing 15 and the insertion part 13 recessed into a cylindrical

shape along the shape of the rod 14. The main body 12 includes a battery 16, a control circuit 17, a pressure sensing unit 20, a heat transfer unit 18 (heat exchanger tube), and a heater 21 provided around the heat transfer unit 18, inside the housing 15. The housing 15 has an air vent 22 and a switch 29 for activating the main body 12. The air vent 22 allows the outside of the housing 15 to communicate with the insertion part 13 and allows air to be supplied to the rod 14 inserted into the insertion part 13.

[0011] The control circuit 17 can receive electric power supply from the battery 16. The control circuit 17 energizes the heater 21 so as to adjust the temperature of the heater 21 within an appropriate range. The control circuit 17 controls the heater 21 in such a manner that the inside of the rod 14 is heated at, for example, 30 °C to 400 °C, preferably 100 °C to 400 °C, and more preferably 150 °C to 250 °C. The pressure sensing unit 20 is composed of a pressure sensor (pressure sensing sensor). The pressure sensing unit 20 receives a supply of electric power from the control circuit 17. The pressure sensing unit 20 senses a negative pressure inside the insertion part 13 (the insertion hole 22), thereby detecting that the user has inhaled.

[0012] The insertion part 13 is formed by recessing another portion of the housing 15 into a cylindrical shape.

[0013] The heat transfer unit 18 has a hollow cylindrical shape. The heat transfer unit 18 is made of a metal material. The metal material constituting the heat transfer unit 18 is preferably a metal having a high thermal conductivity, such as gold, silver, copper, aluminum, or an alloy using any of these metals.

[0014] The heater 21 is composed of, for example, a common heating wire such as a nichrome wire. The heater 21 is wound around the heat transfer unit 18 and disposed in a cylindrical shape. Note that the heating manner of the heater 21 is not limited to a manner using Joule heat due to electric resistance, and may be, for example, an induction heating (IH) manner or a manner using a chemical reaction such as oxidation heat. In this case, the material and shape of the heat transfer unit may be suitably selected according to the heating method. Note that the heater 21, though configured to heat the rod 14 (non-combustible-heating flavor inhaling article) from the outside, may be formed in the shape of a blade that can be inserted into the rod 14 (tobacco part 24) to heat the rod 14 from the inside.

(Rod)

[0015] The rod 14 (non-combustible-heating flavor inhaling article) shown in FIG. 2 is formed into a cylindrical shape. A circumference of the cylindrical rod 14 is preferably 16 mm to 27 mm, more preferably 20 mm to 26 mm, and even more preferably 21 mm to 25 mm. A full length (length in a horizontal direction) of the rod 14 is, for example, not particularly limited but is preferably 40 mm to 90 mm, more preferably 50 mm to 75 mm, and

even more preferably 50 mm to 60 mm.

[0016] The rod 14 includes a tobacco part 24 filled with the tobacco filler 23, a filter part 26 constituting a suction port 25, a connecting part 27 connecting the tobacco part 24 and the filter part 26, and an air vent part 28. The air vent part 28 has a plurality of through holes penetrating the connecting part 27 in the thickness direction. The plurality of through holes are formed so as to be arranged radially when viewed along the extension line of the central axis of the rod 14. In the present embodiment, the air vent part 28 is provided in the connecting part 27. The air vent part 28 may be provided in the filter part 26. In the present embodiment, the through holes of the air vent part 28 are arranged in one line in a circular manner at equal intervals. For example, the air vent part 28 has 124 through holes. The through holes of the air vent part 28 may be arranged in two lines on two rings, at equal intervals. The through holes of the air vent part 28 are arranged continuously or irregularly in one line or two lines of the air vent part 28. When the user puts the suction port 25 into their mouth, the outside air is taken into the mainstream smoke through the air vent part 28.

[0017] The filter part 26 has a cylindrical shape. The filter part 26 includes a rod-shaped first segment 31 filled with, for example, cellulose acetate fibers and a rod-shaped second segment 32 likewise filled with, for example, cellulose acetate fibers. The first segment 31 is located on a side of the tobacco part 24. The first segment 31 may include a hollow part. The second segment 32 is located on a side of the suction port 25. The second segment 32 is solid. Each of the first segment 31 and the second segment 32 is wrapped with an inner plug wrapper 33. The first segment 31 and the second segment 32 are connected by an outer plug wrapper 34. The outer plug wrapper 34 is bonded to the first segment 31 and the second segment 32 by an adhesive constituted by a vinyl acetate resin-type emulsion or the like.

[0018] The length of the filter part 26 can be, for example, 10 mm to 30 mm, the length of the paper tube 35 of the connecting part 27 can be, for example, 10 mm to 30 mm, the length of the first segment 31 can be, for example, 5 mm to 15 mm, and the length of the second segment 32 can be, for example, 5 mm to 15 mm. The length of each of these individual segments is an example, and can be appropriately changed according to production suitability, required quality, the length of tobacco part 24, or the like.

[0019] For example, the first segment 31 (center hole segment) is composed of a first filling layer having one or more hollow parts and an inner plug wrapper 33 covering the first filling layer. The first segment 31 has a function of increasing the strength of the second segment 32. The first filling layer of the first segment 31 is filled with, for example, cellulose acetate fibers at a high density. The cellulose acetate fibers are cured by adding a plasticizer containing triacetin thereto in an amount of, for example, 6% to 20% by mass with respect to the mass of the cellulose acetate. The hollow part of the first seg-

ment 31 has an inner diameter of, for example, φ 1.0 mm to φ 5.0 mm.

[0020] The first filling layer of the first segment 31 may be composed of, for example, a relatively high fiber-filling density, or at a density equivalent to the fiber-filling density of the second filling layer of the second segment 32 described later. Therefore, at the time of suction, air or aerosol flows only through the hollow part, and almost no air or aerosol flows through the first filling layer. For example, when it is desired to diminish the decrease in aerosol component due to filtration in the second segment 32, for example, the length of the second segment 32 may be shortened to make the first segment 31 longer accordingly.

[0021] Shortening the length of the second segment 32 and making the first segment 31 longer by the shortened length is effective in increasing the delivery of aerosol components. Since the first filling layer of the first segment 31 is a fiber filling layer, no discomfort to the user is caused when touched from the outside during use.

[0022] The second segment 32 is composed of a second filling layer and an inner plug wrapper 33 covering the second filling layer. The second segment 32 (filter segment) is filled with cellulose acetate fibers at a typical density and has a performance of filtering typical aerosol components.

[0023] The filtration performance for filtering aerosol (mainstream smoke) emitted from the tobacco part 24 may be different between the first segment 31 and the second segment 32. At least one of the first segment 31 and the second segment 32 may contain flavor. The filter part 26 can have any structure, and may have a structure having multiple segments as described above or be composed of a single segment.

[0024] The connecting part 27 has a cylindrical shape. The connecting part 27 includes, for example, a paper tube 35 obtained by forming, for example, thick paper into a cylindrical shape, and a lining paper 36 (paper) surrounding the paper tube 35. The lining paper 36 has an adhesive layer 37 formed on the entire or approximately the entire surface of one of surfaces (inner surface) of the lining paper 36, except in the vicinity of the air vent part 28. The adhesive layer 37 is constituted by a vinyl acetate resin-type emulsion, etc. The lining paper 36 is rolled in a cylindrical shape around the outside of the tobacco part 24, the paper tube 35, and the filter part 26, and is adhered thereto by the adhesive layer 37 being interposed therebetween, thereby integrally connecting and securing these elements. The plurality of air vent parts 28 are formed by performing laser processing from the outside after the tobacco part 24, the paper tube 35, and the filter part 26 are integrated by the lining paper 36.

[0025] The tobacco part 24 has a cylindrical shape. A full length (a length in the axial direction) of the tobacco part 24 is preferably, for example, 12 mm to 70 mm, more preferably 12 mm to 50 mm, and even more preferably 15 to 30 mm. The shape of the cross section of the tobacco part 24 is not particularly limited, and may be for

example, a circle, an ellipse, a polygon, or the like.

[0026] The tobacco part 24 includes a tobacco filler 23 and a wrapper 41 enclosing the tobacco filler 23. The wrapper 41 is rolled around the tobacco filler 23 in a cylindrical shape.

(Wrapper)

[0027] As shown in FIG. 3, the wrapper 41 has a paper-made base sheet 42 (base sheet 1 (first sheet) in FIG. 7) and a non-metal coating layer 43 provided on one side of the base sheet 42. The coating layer 43 is formed by applying a resin or a thickening agent as a coating agent onto the base sheet 42. The coating layer 43 is provided on a surface of the base sheet 42 on which the tobacco filler 23 is abutted. Thus, the coating layer 43 is arranged on the inner surface side of the wrapper 41 when the coating layer 43 is rolled up as the rod 14 (non-combustible-heating flavor inhaling article). The arrangement of the coating layer 43 is not limited to the arrangement in the inner surface side of the wrapper 41. The coating layer 43 may be provided on a surface on which the base sheet 42 is not in contact with the tobacco filler 23 (outer surface side) or may be provided on both surfaces of the base sheet 42 as a pair. The ventilation level of the wrapper 41 is for example 5 CORESTA units (C.U.) or lower, preferably 3 CORESTA units or lower, more preferably 1 CORESTA unit or lower. The diffusion coefficient of the wrapper 41 is, for example, 0 cm/s to 0.1 cm/s, preferably 0 cm/s to 0.05 cm/s, more preferably 0 cm/s to 0.22 cm/s, when CO₂ or N₂ is used as a gas and the coefficient is measured under the measurement conditions of an environment temperature of 22 °C and an environment relative humidity of 60%. As a measurement device for the diffusion coefficient, a diffusivity tester was used. The Diffusivity Tester manufactured by the Borgwaldt company was used, and the measurement was performed pursuant to an instruction manual issued by the company.

[0028] The base sheet 42 is constituted by commercially available paper. The basis weight of the base sheet 42 is for example 20 g/m² to 50 g/m², preferably 25 g/m² to 45 g/m², and more preferably 33 g/m² to 39 g/m². An opacity of the wrapper 41 is preferably 72% to 100%, for example. A whiteness of the wrapper 41 is preferably 70% to 100%, for example.

[0029] The base sheet 42 may be constituted by a commercially available non-woven fabric.

[0030] The coating layer 43 contains a resin, a thickening agent, or a mixture thereof. A part of the resin, the thickening agent, or the mixture thereof contained in the coating layer 43 may invade into and clog micro pores of the base sheet 42, and the part is thereby possible to bring the diffusion coefficient of the wrapper 41 into the range of 0 cm/s to 0.022 cm/s.

[0031] If the coating layer 43 contains a resin as a main component, the resin may be polyvinyl alcohol (PVA) or polyvinyl acetate (PVAc), or a composition (mixture)

thereof. If the coating layer 43 contains a resin as a main component, the resin may be constituted as a composition additionally containing a filler. The filler may be calcium carbonate, aluminum hydroxide, aluminum oxide, titanium dioxide, kaolin, talc, or silica, or a mixture of some of these materials. By making a filler contained in the coating layer 43, blocking between the wrappers 41 is prevented, curling of the wrapper 41 is prevented, and the whiteness/opacity of the wrapper 41 is improved.

[0032] If the coating layer 43 contains a thickening agent as a main component, the thickening agent may be any one of the following or a composition obtained by mixing some of the following: arabic gum, starch, sodium alginate, pectin, carboxymethyl cellulose, methyl cellulose, ethyl cellulose, microcrystalline cellulose, or a hydroxypropyl methyl cellulose (HPMC). If the coating layer 43 contains a thickening agent as a main component, the thickening agent may be constituted as a composition additionally containing a filler. The filler may be calcium carbonate, aluminum hydroxide, aluminum oxide, titanium dioxide, kaolin, talc, or silica, or a mixture of some of these materials. Making a filler contained in the coating layer 43 provides advantages, such as prevention of blocking (adhesion) between the wrappers 41, prevention of curling of the wrapper 41, and improvement in the whiteness/opacity of the wrapper 41.

[0033] The coating layer 43 may be constituted by a composition (mixture) including both of the above-described resin and the above-described thickening agent. In this case, the coating layer 43 may further include one of the above-listed fillers or a composition obtained by mixing two or more of the above-listed fillers.

[0034] The amount of the coating agent applied to the base sheet 42 to form the coating layer 43 varies with a type of a coating agent. For example, if arabic gum is used as a coating agent, an amount of application per 1 m² is miniscule, preferably, for example, greater than 0 g/m² and less than 10 g/m². If polyvinyl is used as a coating agent, an amount of application per 1 m² is preferably miniscule, for example, greater than 0 g/m² and less than 10.0 g/m². If polyvinyl acetate is used as a coating agent, an amount of application per 1 m² is preferably miniscule, for example, greater than 0 g/m² and less than 10.0 g/m². Preferably, the lower limit of an amount of each material to be applied is set to a necessary amount, which is determined while a diffusion coefficient is determined.

[0035] As shown in FIG. 4, the wrapper 41 has a one end 41A and an other end 41B provided on the opposite side of the one end 41A. Wrapping around the tobacco filler 23, the other end 41B is bonded to the upper side of the one end 41A by the adhesive 45. For this reason, the one end 41A and the other end 41B constitute an overlapping part 44 where these ends are superposed and adhered. On the portion of the coating layer 43 corresponding to the other end 41B, surface processing is performed to improve wettability. This surface processing may be, for example, corona processing, plasma

processing, or other types of surface reformulation processing. Through performing the surface processing in such a manner, the surface on which the surface processing is performed becomes a bonding surface 47 between the one end 41A and the other end 41B, thereby reinforcing the bonding through the adhesive 45 therebetween.

[0036] In the present embodiment, on the portion of the coating layer 43 corresponding to the other end 41B, surface processing is performed to improve wettability. Surface processing to improve wettability may be performed on the coating layers 43 of both of the one end 41A and the other end 41B. Or, the following structure may be adopted as an alternative to this surface processing. Namely, a non-formation area 46 in which no coating layer 43 is formed may be provided at a position corresponding to either the one end 41A or the other end 41B. In the example of FIG. 4, a non-formation area 46 is provided at a position corresponding to the other end 41B.

[0037] The adhesive 45 for adhering the one end 41A to the other end 41B is applied to the surface on which the surface processing is performed or to the non-formation area 46. The adhesive 45 is constituted by a vinyl acetate resin-type emulsion, etc., for example. The surface on which the surface processing is performed or the non-formation area 46 constitutes a bonding surface 47 between the one end 41A and the other end 41B, in conjunction with the adhesive 45.

[0038] The wrapper 41 may contain flavor components. Specifically, the flavor components may be contained in the base sheet 42 of the wrapper 41, or in the coating layer 43 of the wrapper 41.

[0039] The tobacco filler 23 is composed of a cut rag of leaf tobacco (dried leaf) and/or a cut of a sheet (sheet-molded material) made of pulverized leaf tobacco with a predetermined width. The tobacco filler 23 is formed by filling a cut of a sheet (sheet-molded material) made of pulverized leaf tobacco with a predetermined width and/or a cut rag of tobacco leaf (dried leaf) in a random orientation. This sheet-molded material may contain an aerosol-generating base material and a flavor component. The aerosol-generating base material and the flavor component may be added to or contained in the cut rag of leaf

(Tobacco Filler)

[0040] The tobacco filler 23 according to the present invention includes a tobacco filling material (tobacco) and an aerosol-generating base material. The tobacco filler 23 may further include a volatile flavor, water, or the like. There are no particular restrictions on the size of tobacco used as tobacco filling material or the method for preparing the tobacco filling material. As the tobacco filling material, for example, dried tobacco leaf cut into strips having a width of 0.8 mm to 1.2 mm may be used. When the tobacco leaf is cut in the above width, the resultant cut rag will have a length of approximately 1 mm to 40 mm.

Alternatively, the dried tobacco leaf may be pulverized and homogenized to have an average particle size of, for example, about 20 μm to 200 μm , processed into a sheet, and then cut into strips (tobacco reconstituted sheet, sheet-molded material) having a width of 0.8 mm to 1.2 mm to use as the tobacco filling material. When cut into the above width, the length of the cut rag is approximately 1 mm to 40 mm, for example. Further, the above sheet-processed material that is gathered instead of being cut may be included as the tobacco filling material. Various kinds of tobacco can be used for the tobacco included in the tobacco filling material regardless of whether the dried tobacco leaf is cut to use or pulverized and homogenized to use as a sheet.

[0041] For the tobacco filling material, flue-cured tobacco, burley tobacco, oriental tobacco, domestic tobacco, or other varieties such as *Nicotiana tabacum* L., *Nicotiana rustica* L., and *Nicotiana tomentososa* may be blended as appropriate to realize an intended taste to use. Details of the tobacco varieties are disclosed in "Encyclopedia of Tobacco, Tobacco Academic Studies Center, 2009.3.31".

[0042] There are conventional methods for pulverizing tobacco to process the pulverized tobacco into a uniform sheet (tobacco reconstituted sheet). The first is a filtered-out sheet made by a papermaking process; the second is a cast sheet made by mixing a suitable solvent such as water and a required kind/amount of a binder with a pulverized tobacco material, homogenizing the mixture, and then thinly casting the homogenized mixture on a plate or plate belt made of metal, and drying the cast mixture; and the third is a rolled sheet made by mixing a suitable solvent such as water and a required kind/amount of a binder with a pulverized tobacco material, homogenizing the mixture, and extruding the homogenized mixture into a sheet shape. Details of the kinds of the uniform sheet (tobacco reconstituted sheet) are disclosed in "Encyclopedia of Tobacco, Tobacco Academic Studies Center, 2009.3.31".

[0043] It is preferable that the tobacco filler 23 have the leaf tobacco (dried leaf) and the sheet into which pulverized leaf tobacco is molded be coated with or contain the aerosol-generating base material and the volatile flavor. The aerosol-generating base material is contained in an amount of, for example, 5 weight% to 30 weight% with respect to the leaf tobacco (dried leaf) and the sheet-molded pulverized leaf tobacco. The aerosol-generating base material is a material capable of generating an aerosol through heating, and examples thereof include glycerin, propylene glycol (PG), triethylcitrate (TEC), triacetin, and 1,3-butanediol. These may be used alone or in combination of two or more. As the aerosol-generating base material, glycerin is preferable to be used.

[0044] The filling density of tobacco filler 23 is not particularly limited, but is usually 250 mg/cm^3 to 700 mg/cm^3 , preferably 320 mg/cm^3 to 420 mg/cm^3 , from the viewpoint of ensuring the performance of the rod 14 (non-combustible-heating flavor inhaling article) and imparting a de-

cent smoking taste. To be specific, when the tobacco part 24 has a circumference of 22 mm and a length of 20 mm, the range of the content of the tobacco filler 23 in the tobacco part 24 can be from 200 mg to 400 mg, preferably from 250 mg to 320 mg, per tobacco part 24.

[0045] The volatile flavor (flavor component) contained in the tobacco filler 23 is not limited and can be any type of flavor provided that it is a flavor used for the electric-heating flavor inhaling system 11. The flavor component is one selected from the group consisting of: 1-menthol; natural plant flavors (e.g., cinnamon, sage, herb, chamomile, kudzu (*Pueraria lobata*), hydrangeae dulcis folium, clove, lavender, cardamom, caryophyllus, nutmeg, bergamot, geranium, honey essence, rose oil, lemon, orange, cassia bark, caraway, jasmine, ginger, coriander, vanilla extract, spearmint, peppermint, cassia, coffee, celery, cascarilla, sandalwood, cocoa, ylang ylang, fennel, anise, licorice, St John's bread, prune extract, and peach extract); saccharides (e.g., glucose, fructose, isomerized saccharide, and caramel); cocoa (e.g., powder and extract); esters (e.g., isoamyl acetate, linalyl acetate, isoamyl propionate, and linalyl butyrate); ketones (e.g., menthone, ionone, damascenone, and ethyl maltol); alcohols (e.g., geraniol, linalool, anethole, and eugenol); aldehydes (e.g., vanillin, benzaldehyde, and anisaldehyde); lactones (e.g., γ -undecalactone and γ -nonalactone); animal flavors (e.g., musk, ambergris, civet, and castoreum); hydrocarbons (e.g., limonene and pinene); and extracts of tobacco (tobacco leaves, tobacco stems, tobacco flowers, tobacco roots, and tobacco seeds). As a volatile flavor contained in the tobacco filler 23, 1-menthol is particularly preferable. Alternatively, as a volatile flavor contained in the tobacco filler 23, two or more kinds selected from the above group may be mixed and used.

[0046] The flavor component contained in the tobacco filler 23 may be used as a solid, or may be used by being dissolved or dispersed in a suitable solvent such as propylene glycol, ethyl alcohol, benzyl alcohol, and triethyl citrate. A flavor which easily forms a dispersion state in a solvent by addition of an emulsifier, such as a hydrophobic flavor and oil-soluble flavor, may be preferably used. Such flavor components may be used alone or in combination.

[0047] An amount of the volatile flavor contained in the tobacco filler 23 is not particularly limited. From the viewpoint of imparting a decent smoking taste, the tobacco filler contains 0.5 weight% to 10 weight%, preferably 1 weight% to 9 weight%, more preferably 1.2 weight% to 8 weight%, of the volatile flavor with respect to the weight of the tobacco filling material.

(Method of Manufacturing Tobacco Part)

[0048] Prior to manufacturing of a tobacco part 24, a coating agent is applied to the base sheet 42 to form a wrapper 41. The wrapper 41 is formed by applying a coating agent, which serves as the coating layer 43, to one of the surfaces of the rolled-up base sheet 42. As a meth-

od of applying the coating agent, various type of coating methods can be adopted, for example, flexography coating, gravure coating, dye coating, gateroll coating, and the like.

[0049] In the wrapper 41 where the coating layer 43 is formed on the surface of the base sheet 42, the coating layer 43 corresponding to at least one of the one end 41A or the other end 41B is preferably subjected to surface processing, for example, corona processing, plasma processing, or the like. Particularly, in the example shown in FIG. 4 of the present embodiment, the coating layer 43 corresponding to the other end 41B is preferably subjected to surface processing, for example, corona processing, plasma processing, or the like.

[0050] Thus, wettability (affinity) to the adhesive 45 is improved in at least one of the one end 41A and the other end 41B. The adhesive 45 is applied to such a processed surface. Then, the one end 41A is adhered to the other end 41B so that the wrapper 41 is wound around the tobacco filler 23 to form a cylindrical tobacco part 24. Thus, the processed surface becomes a bonding surface 47 between the one end 41A and the other end 41B, and the affinity of the adhesive 45 to the coating layer 43 is improved, thereby forming a strong bonding part.

[0051] Alternatively, instead of the step of such surface processing, a non-formation area 46 in which the coating layer 43 is not formed may be provided in either one of the one end 41A or the other end 41B of the wrapper 41. The adhesive 45 is applied to the non-formation area 46, and the one end 41A is adhered to the other end 41B so that the wrapper 41 is wound around the tobacco filler 23 to form a cylindrical tobacco part 24. At this time, the non-formation area 46 serves as a bonding surface 47 between the one end 41A and the other end 41B. Thus, the non-formation area 46 on the base sheet 42 serves as a bonding surface 47, and since there is no coating layer 43 on the bonding surface 47, a strong bonding part is thereby formed.

[0052] The wrapper 41, which either has been subjected to the surface processing or in which the non-formation area 46 is formed, is introduced into a common cigarette making machine and rolled around the tobacco filler 23 and is formed into a thin cylindrical shape. At this time, the wrapper 41 is set in the cigarette making machine such that the coating layer 43 is inside (on the tobacco filler 23 side). Then, the tobacco filler 23 and the wrapper 41 formed in a thin cylindrical shape is cut at a predetermined length by a cutter, etc. Thereby, the tobacco part 24 is formed. The tobacco part 24 is arranged in series with a paper tube 35 and a filter part 26 that are separately prepared. These tobacco part 24, the paper tube 35, and the filter part 26 are rolled in series and in an integrated manner with the lining paper 36. Through the above-described steps, the rod 14 of the electric-heating flavor inhaling system 11 is manufactured.

[0053] The main body 12 of the electric-heating flavor inhaling system 11 can also be manufactured by a known manufacturing method for an electronic device. By com-

bining the rod 14 and the main body 12 thus manufactured, the electric-heating flavor inhaling system 11 is realized.

5 (Operation of Electric-Heating Flavor Inhaling System)

[0054] As shown in FIG. 5, by inserting the rod 14 into the insertion part 13 of the main body 12, the main body 12 is equipped with the rod 14. In this state, when the user presses a switch 29 to activate the main body 12, the control circuit 17 drives the heater 21 to raise the temperature of the heater 21 and the heat transfer unit 18 to a predetermined temperature (for example, 30 °C to 400 °C). Thereby, the tobacco part 24 is heated. In this state, when the user holds the suction port 25 and starts suctioning, vapor (aerosol) containing smoke aroma of tobacco is emitted from the tobacco part 24. The vapor is cooled by the air flowing into the inside of the connecting part 27 from the air vent part 28, and thereby more reliable aerosolization (formation of minute droplets) is performed.

[0055] The aerosol is properly filtered by the filter part 26 and delivered to the user's oral cavity. This allows the user to taste the smoke aroma of the cigarette. At this time, the control circuit 17 senses the negative pressure in the housing 15 through the pressure sensing unit 20. The control circuit 17 thus can count the number of times the user has inhaled and calculate the total inhalation time. The control circuit 17 stops heating the heater 21 and stops the heat transfer unit 18 from heating when a predetermined time elapses after the switch 29 is pressed, the user performs a predetermined number of inhalations, the total inhalation time of the user exceeds a predetermined time, or the user presses the switch 29 again to release the active state. One flavor inhaling operation thus ends. Then, by removing the rod 14 after use from the insertion part 13 and inserting a new rod 14 into the insertion part 13, the user can again taste the cigarette smoke aroma from the new rod 14.

[0056] In the rod 14 (non-combustible-heating flavor inhaling article) of the present embodiment, the diffusion coefficient of the wrapper 41 is suppressed to 0 cm/s to 0.022 cm/s by the coating layer 43. For this reason, the volatile flavor diffused in the rod 14 when the rod 14 is being stored does not pass the wrapper 41 and does not create stains on the surface of the wrapper 41. Even when the rod is stored at a low temperature, the diffused volatile flavor does not pass through the wrapper 41. Although the details of the mechanism of crystallization of a volatile flavor (particularly 1-menthol) under low-temperature storage are unknown, a volatile flavor that passes the micro pores of the wrapper 41 and adheres to the outer surface of the wrapper 41 becomes the nuclei of crystals, the crystals then grow and capillaceous (fibrous) crystals of the volatile flavor are thereby formed. In the present embodiment, the volatile flavor is prevented from passing through the wrapper 41. For this reason, it seems that a volatile flavor that would become crystal nuclei is

prevented from being adhered to the outer surface of the wrapper 41. Thus, in the rod 14 of the present embodiment, not only stains caused on the wrapper 41 surface can be prevented but growth of fibrous crystals of the volatile flavor on the wrapper 41 surface can also be prevented during low-temperature storage.

[0057] According to the first embodiment, the following can be said.

[0058] A non-combustible-heating flavor inhaling article includes a tobacco part 24 having a tobacco filler 23 including a tobacco filling material and a volatile flavor, and a wrapper 41 surrounding the tobacco filler 23, and the wrapper 41 has a base sheet 42 and a non-metal coating layer 43 provided on a surface on which the base sheet 42 is abutted to the tobacco filler 23, and the diffusion coefficient of the wrapper 41 is 0 cm/s to 0.022 cm/s.

[0059] According to the configuration, through the provision of the coating layer 43, it is possible to clog the micro pores in the base sheet 42 until the diffusion coefficient reaches the order of 0 cm/s to 0.022 cm/s. For this reason, it is possible to prevent the volatile flavor from passing through the wrapper 41. For this reason, it is possible to prevent the volatile flavor in the tobacco filler 23 from staining the wrapper 41. When the non-combustible-heating flavor inhaling article is stored at a low temperature, a diffused volatile flavor may cause fibrous crystals on the surface of the wrapper 41. According to the non-combustible-heating flavor inhaling article of the present embodiment, such production of fibrous crystals of a volatile flavor is prevented. It is thereby possible to provide a high-quality non-combustible-heating flavor inhaling article without causing user discomfort from the outer appearance of the non-combustible-heating flavor inhaling article.

[0060] The coating layer 43 contains a resin, a thickening agent, or a mixture thereof. According to the configuration, the micro pores in the base sheet 42 can be clogged by the coating layer 43.

[0061] The resin is polyvinyl alcohol or polyvinyl acetate. According to this configuration, it is possible to obtain a wrapper 41 in which a diffusion coefficient is sufficiently reduced with a small amount of application to the base sheet 42.

[0062] The thickening agent is arabic gum, starch, sodium alginate, pectin, carboxymethyl cellulose, or methylcellulose. According to this configuration, it is possible, even by using various types of thickening agents, to obtain a wrapper 41 having a sufficiently reduced diffusion coefficient.

[0063] The coating layer 43 further includes a filler. According to the configuration, the coating layer 43 containing a micro-grain filler can more effectively clog the micro pores in the base sheet 42. Furthermore, adhesion of pre-rolled wrappers 41 in the storage, so-called blocking, and curling of a wrapper 41 can be effectively prevented. Furthermore, whiteness/opacity of the wrapper 41 can be improved.

[0064] The filler is calcium carbonate, aluminum hydroxide, aluminum oxide, titanium dioxide, microcrystalline cellulose, kaolin, talc, or silica. According to the configuration, blocking of the wrappers 41 and curling of a wrapper 41 can be effectively prevented. Furthermore, whiteness/opacity of the wrapper 41 can be improved.

[0065] The volatile flavor is 1-menthol. L-menthol is prone to diffuse inside a package during storage and cause troubles, such as stains on a wrapper 41 during storage, or cause fibrous (acicular) crystals on a wrapper 41 during low-temperature storage. According to the above configuration, even in a case where a volatile flavor is 1-menthol, it is possible to prevent troubles such as stains caused on a wrapper 41 during storage or fibrous crystals produced on a wrapper 41 during low-temperature storage.

[0066] The tobacco filler 23 includes 1.2 weight% of the volatile flavor with respect to the weight% of the tobacco filling material. Usually, in such a tobacco filler 23 containing a large amount of a volatile flavor, the volatile flavor penetrates into the wrapper 41 and forms stains or forms crystals on the wrapper 41 surface. According to this configuration, even in a case where a tobacco filler 23 contains a large amount of a volatile flavor, which is more likely to cause such stains and crystals, it is possible to effectively prevent stains and crystals on a wrapper 41.

[0067] The ventilation level of the wrapper 41 is less than 1 CORESTA unit. According to this configuration, it is possible to make the wrapper 41 with a low ventilation level, which allows further reduction of the possibility that a volatile flavor will pass through the wrapper 41. Thus, it is possible to prevent troubles such as stains caused on a wrapper 41 during storage or fibrous crystals caused in a wrapper 41 during low-temperature storage.

[0068] The base sheet 42 is paper and/or non-woven fabric. According to this configuration, the outer appearance of the wrapper 41 of a non-combustible-heating flavor inhaling article can be made to look similar to a traditional cigarette, which can prevent a user from having a feeling of discomfort.

[0069] In this case, the wrapper 41 has the one end 41A and the other end 41B provided on the opposite side of the one end 41A and bonded to the one end 41A. The coating layer 43 of the part corresponding to at least one of the one end 41A or the other end 41B is subjected to surface processing to improve wettability, and the processed surface constitutes a bonding surface 47 between the one end 41A and the other end 41B.

[0070] With the method of manufacturing a non-combustible-heating flavor inhaling article, a coating agent containing a resin or a thickening agent is applied to a base sheet 42 to form a wrapper 41 having a coating layer 43, and surface processing to improve wettability is performed on the coating layer 43 of the part corresponding to at least one of the one end 41A of the wrapper 41 or the other end 41B provided on the opposite side of the one end 41A and bonded to the one end 41A, and the one end 41A and the other end 41B are adhered to

each other on the processed surface which serves as a bonding surface 47 so that a tobacco filler 23 containing a volatile flavor is enclosed by the wrapper 41.

[0071] According to these configurations, due to the provision of the coating layer 43, it is possible to prevent reduction of the adhesion strength in the bonding part of the wrapper 41. It is thereby possible to prevent troubles, such as failed adhesion, etc., in the overlapping part of the wrapper 41.

[0072] In this case, the wrapper 41 has the one end 41A and the other end 41B provided on the opposite side of the one end 41A and bonded to the one end 41A. A non-formation area 46 in which no coating layer 43 is formed may be provided at a part corresponding to either the one end 41A or the other end 41B. The non-formation area 46 serves as a bonding surface 47 between the one end 41A and the other end 41B.

[0073] According to this configuration, it is possible not to provide the coating layer 43 in the portion serving as a bonding surface 47. Thus, it is possible to prevent reduction of the adhesion strength in the adhesive part of the wrapper 41 due to the provision of the coating layer 43. By leaving the coating layer 43 on either one of the one end 41A or the other end 41B, it is possible to keep the diffusion coefficient of the wrapper within the range of 0 cm/s to 0.022 cm/s.

[0074] The electric-heating flavor inhaling system 11 includes a non-combustible-heating flavor inhaling article and a heater 21 for heating the non-combustible-heating flavor inhaling article. According to the configuration, an electric-heating flavor inhaling system 11 with which the occurrence of stains on the wrapper 41 due to a volatile flavor and the occurrence of fibrous (acicular) crystals during low-temperature storage are prevented can be realized.

[0075] The heater 21 heats the non-combustible-heating flavor inhaling article at a temperature between 30 °C to 400 °C. Since a conventional cigarette involves combustion, the heating temperature of the tobacco filler 23 is very high at 700 °C to 900 °C. According to the above configuration, since the heating temperature of the tobacco part 24 is extremely low compared to traditional cigarettes, it is necessary to increase an amount of a volatile flavor contained in the tobacco filler 23 so that a user can perceive the same strength of the volatile flavor in aerosol as traditional cigarettes. If a volatile flavor is increased, there are a problems wherein more stains tend to be appear on the wrapper 41 due to the volatile flavor and more fibrous crystals tend to be produced on the wrapper 41 during low-temperature storage. According to the embodiment, even in a case where a volatile flavor is increased, it is possible to effectively prevent an occurrence of stains on the wrapper 41 and an occurrence of fibrous crystals on the wrapper 41. Thus, a high-quality non-combustible-heating flavor inhaling article and an electric-heating flavor inhaling system 11 comprised thereof can be realized.

[First Modification]

[0076] As shown in FIG. 6, the wrapper 41 may be constituted only by a paper-made base sheet 42 (base sheet 1 in FIG. 9). As a paper-made base sheet 42, glassine paper may be used, for example. Glassine paper can suppress micro pores in the base sheet 42 and can minimize a diffusion coefficient. For this reason, the coating layer 43 is not always necessary.

[0077] As long as it can inhibit micro pores in the base sheet 42 and reduce a diffusion coefficient, a non-woven fabric base sheet 42 may be used instead of a base sheet 42 made of paper such as glassine paper.

[0078] According to the first modification of the first embodiment, the following can be said.

[0079] A non-combustible-heating flavor inhaling article includes a tobacco part 24 having a tobacco filler 23 including a tobacco filling material and a volatile flavor, a wrapper 41 surrounding the tobacco filler 23, and the wrapper 41 has a paper-made or non-woven fabric-made base sheet 42, and the diffusion coefficient of the wrapper 41 is 0 cm/s to 0.006 cm/s.

[0080] According to this configuration, it is possible to prevent the volatile flavor from passing through the wrapper 41 by selecting the base sheet 42, namely the wrapper 41, as appropriate. For this reason, it is possible to prevent the volatile flavor in the tobacco filler 23 from forming stains on the wrapper 41. When the non-combustible-heating flavor inhaling article is stored at a low temperature, diffused volatile flavor may cause fibrous crystals on the surface of the wrapper 41. According to the non-combustible-heating flavor inhaling article of the present embodiment, such production of fibrous crystals of a volatile flavor is prevented. It is thereby possible to provide a high-quality non-combustible-heating flavor inhaling article without causing user discomfort from the outer appearance of the non-combustible-heating flavor inhaling article.

[Second Modification]

[0081] As shown in FIG. 7, it is also preferable if the wrapper 41 has a second base sheet 42A (the base sheet 2 (second sheet) in FIG. 9) inside the coating layer 43 and made of a material the same as or differing from the material of the base sheet 42, in addition to a paper-made base sheet 42 (the base sheet 1 (first sheet) in FIG. 9) and the coating layer 43. In other words, the coating layer 43 is interposed between the base sheet 42 and the base sheet 42A. By making the wrapper 41 a three-layer structure and inhibiting micro pores in the base sheet 42, it is possible to reduce the diffusion coefficient.

[0082] As long as it can inhibit micro pores in the base sheet 42 and reduce a diffusion coefficient, a non-woven fabric base sheet 42 may be used instead of a base sheet 42 made of paper. Similarly, as long as it can inhibit micro pores in the base sheet 42A and reduce a diffusion coefficient, a base sheet 42A made of a non-woven fabric

may be used instead of a base sheet 42A made of paper.

[0083] According to the second modification of the first embodiment, the following can be said.

[0084] A non-combustible-heating flavor inhaling article includes a tobacco part 24 having a tobacco filler 23 including a tobacco filling material and a volatile flavor, and a wrapper 41 surrounding the tobacco filler 23, and the wrapper 41 has multiple base sheets 42 and 42A made of paper or a non-woven fabric and a coating layer 43 formed between the base sheets 42 and 42A, and the diffusion coefficient of the wrapper 41 is 0.001 cm/s to 0.015 cm/s.

[0085] According to this configuration, it is possible to prevent the volatile flavor from passing through the wrapper 41 by selecting the material that constitutes the base sheets 42 and 42A and the coating layer 43, namely the wrapper 41, as appropriate. For this reason, it is possible to prevent the volatile flavor in the tobacco filler 23 from forming stains on the wrapper 41. When the non-combustible-heating flavor inhaling article is stored at a low temperature, a diffused volatile flavor may cause fibrous crystals on the surface of the wrapper 41. According to the non-combustible-heating flavor inhaling article of the present embodiment, such production of fibrous crystals of a volatile flavor is prevented. It is thereby possible to provide a high-quality non-combustible-heating flavor inhaling article without causing user discomfort from the outer appearance of the non-combustible-heating flavor inhaling article.

[Second Embodiment]

[0086] With reference to FIG. 8, the electric-heating flavor inhaling system 11 according to the second embodiment and the non-combustible-heating flavor inhaling article (rod 14) are described below. In the present embodiment, other than the shape of the rod 14, the parts are the same as those in the first embodiment. In the following, the rod 14, which is a part different from the first embodiment, will be mainly described, and descriptions of the same parts will be omitted.

[0087] The rod 14 includes a tobacco part 24 filled with the tobacco filler 23, a filter part 26 constituting a suction port 25, a connecting part 27 connecting the tobacco part 24 and the filter part 26, an additional segment 51 (second filter part) provided adjacently to the tobacco part 24, and an air vent part 28. The tobacco part 24, the filter part 26, and the air vent part 28 have the same configurations as those in the first embodiment. It is preferable that the wrapper 41 of the tobacco part 24 have the configuration similar to that in the first and second modifications in addition to the configuration similar to that in the first embodiment.

[0088] The additional segment 51 (second filter part) is formed in a cylindrical shape, and is provided so as to cover (hide) a second end surface 24B opposite to a first end surface 24A facing the filter part 26 of the tobacco part 24. More specifically, the additional segment 51 is

provided adjacently to the tobacco part 24 so as to cover the second end surface 24B of the tobacco part 24. The additional segment 51 has ventilation, particularly high ventilation in the axial direction of the column.

[0089] In the present embodiment, the additional segment 51 is a rod-shaped filter filled with cellulose acetate fibers. The additional segment 51 is configured as a center hole segment having a hollow part 51A at the center of the additional segment 51, similarly to the first segment 31 of the filter part 26 in the first embodiment; however, the embodiment of the additional segment 51 is not limited to this configuration. The additional segment 51 may be configured as a solid filter in which no center hole is provided similarly to the second segment 32 of the filter part 26, or as a circular projection in which the lining paper 36 of the connecting part 27 projects toward the distal end side (the opposite side of the suction port 25) with respect to the tobacco part 24 (tobacco filler 23) (in the latter case, the inside of the projecting portion is formed as a hollow space).

[0090] The connecting part 27 includes, for example, a paper tube 35 obtained by forming, for example, thick paper into a cylindrical shape, and a lining paper 36 surrounding the paper tube 35. One surface (inner surface) of the lining paper 36 is coated with an adhesive comprised of a vinyl acetate resin-type emulsion, etc. on the entire surface or almost the entire surface except the vicinity of the air vent part 28. The lining paper 36 is rolled in a cylindrical shape around the outside of the additional segment 51, the tobacco part 24, the paper tube 35, and the filter part 26 to connect them integrally. The plurality of air vent parts 28 are formed by performing laser processing from the outside after the tobacco part 24, the paper tube 35, and the filter part 26 are integrated by the lining paper 36.

[0091] The means of connecting the additional segment 51 to the tobacco part 24 is not limited to the lining paper 36. Naturally, the additional segment 51 and the tobacco part 24 can be coupled by a roll paper provided separate from the lining paper 36.

[0092] The effects of the rod 14 (non-combustible-heating flavor inhaling article) according to the present embodiment will be described. The rod 14 according to the present embodiment has an additional segment 51 serving as a cover provided at the distal side of the tobacco part 24. For this reason, it is possible to prevent an occurrence of capillaceous (fibrous or acicular) crystals of a volatile flavor (particularly, 1-menthol) from the part where the tobacco filler 23 is exposed from the tobacco part 24 during low-temperature storage.

[0093] In the cases where the segment 51 is constituted by a center hole segment having a hollow part 51A at the center of the additional segment 51 or a circular projecting portion made from the lining paper 36, crystals of a volatile flavor grown from the part where the tobacco filler 23 is exposed will occur inside of the hollow part 51A and the inside of the projecting portion of the additional segment 51 during low-temperature storage. How-

ever, if the crystals grow inside the hollow part 51A or the projecting portion, a user cannot visually identify the crystals from the outside, and the fibrous (acicular) crystals will dissolve within a short time when the rod is returned to a normal temperature, and the crystals substantially do not cause any troubles. Since the additional segment 51 is configured as a center hole segment or a projecting portion, it is possible to prevent the increase of ventilation resistance as much as possible, and in turn, to prevent the additional segment 51 becoming a design limitation to the rod 14.

[0094] According to the present embodiment, the following can be said.

[0095] The non-combustible-heating flavor inhaling article includes the filter part 26 provided adjacently to the tobacco part 24, and the additional segment 51 having ventilation and provided so as to cover the second end surface 24B opposite to the first end surface 24A facing the filter part 26 of the tobacco part 24. According to this configuration, even when crystals of a volatile flavor are caused from the tobacco filler 23 located at the second end surface 24B during low-temperature storage, it is possible to cover up the crystals by the additional segment 51. Thus, it is possible to prevent troubles stemming from the user's visual identification of the crystals, which leads to a misunderstanding that a product is contaminated by fibers, etc.

[0096] The non-combustible-heating flavor inhaling article and the electric-heating flavor inhaling system 11 are not limited to those described in the foregoing embodiments and modifications; they can be concretized by modifying the structural elements without departing from the gist of the invention when they are implemented. Some of the structural elements may be deleted from each of the embodiments.

[Examples]

[0097] In the following, Examples 1 to 8 and Comparative Examples 1 to 6 in which a rod 14 was formed with the change of the type of the wrapper 41 will be described according to the table shown in FIG. 9. Before the descriptions of the examples and comparative examples, a method of measuring a diffusion coefficient, a method of evaluating a stain occurrence rate, and a method of evaluating crystal occurrence are described first.

<Method of Measuring Diffusion Coefficient>

[0098] A diffusion coefficient was measured by the Diffusivity Tester manufactured by the Borgwaldt company, using N₂ and CO₂ as gas and under a temperature of 22 °C and a relative humidity of 60% as measurement conditions. The other measurement conditions were in compliance with an instruction manual issued by the company.

<Method of Evaluating Stain Occurrence Rate and Method of Evaluating Stain Suppression Effect>

[0099] A tobacco rod having a circumference of 22 mm and a length of 56 mm (a long tobacco rod for cigarettes) was evaluated. For the rod to be evaluated, a tobacco filler 23 including 1-menthol (volatile flavor) at 6 weight% with respect to the weight of the tobacco filling material was used. This final-product tobacco rod using this tobacco filler 23 was placed in an airtight (gas-barrier) container at room temperature for 14 days, and the number of stains was evaluated. A tobacco rod with 5 or more stains having a maximum diameter of 1 mm or larger, or a tobacco rod with one or more stains having a maximum diameter of 3 mm or larger was defined as a stain-occurring rod.

[0100] The stain occurrence rate was calculated as described below. 200 tobacco rods configured in the above-described manner were prepared, and they were stored under the above-described conditions and observed after 14 days of storage, and the number of stain-occurring rods was counted. The ratio of the stain-occurring rods to the total (200 rods) was calculated as a stain occurrence rate (%).

[0101] A rod with a stain occurrence rate of less than 35% is defined as a rod having the stain suppressing effect ("O"), and a rod with a stain occurrence rate of 35% or more is defined as a rod having no stain suppressing effect ("X").

<Method of Evaluating Crystal Occurrence>

[0102] As the tobacco rod used for evaluation, the same tobacco rod as that used for evaluating the above stain occurrence rate and stain suppression effect (a long tobacco rod for cigarettes) was used. For the rod to be evaluated, a tobacco filler 23 including 1-menthol (volatile flavor) at 6 weight% with respect to the weight of the tobacco filling material was used. This final-product tobacco rod using this tobacco filler 23 was placed in an airtight (gas-barrier) container and stored in a refrigerator at the temperature of 4 °C for 14 days. After the storage, the presence/absence of fibrous (acicular) crystals of 1-menthol was evaluated. A rod with no fibrous crystals on the surface of the wrapper 41 is defined as a rod having an effect ("O"), and a rod with fibrous crystals on the surface of the wrapper 41 is defined as a rod having no effect ("X").

[Example 1]

[0103] As the base sheet 42, a piece of base paper of common tipping paper (TP base paper) also used in traditional cigarettes was used. This TP base paper is commercially available from paper makers. The basis weight of this base sheet 42 was 36 g/m².

[0104] As a coating material used for the coating layer 43 of the wrapper 41, arabic gum, which is a thickening

agent, was used. This arabic gum was applied to one of the surfaces of the base sheet 42 using a flexography coater, thereby forming the wrapper 41. The amount of arabic gum applied to the base sheet 42 (an amount of coating) was 7.3 g/m².

[0105] The total basis weight of this wrapper 41 was 43 g/m². The opacity of the wrapper 41 including the base sheet 42 and the coating layer 43 was 81%. The whiteness of this wrapper 41 was 88%.

[0106] The diffusion coefficient of the wrapper 41 was 0.002 cm/s. The ventilation level of the wrapper 41 was less than 1 CORESTA unit. The stain occurrence rate was 27.5%, and there was the stain suppression effect ("O"). There was the crystal suppression effect ("O").

[Example 2]

[0107] As the base sheet 42, a piece of base paper of common tipping paper (TP base paper) also used in traditional cigarettes was used. The basis weight of this base sheet 42 was 36 g/m².

[0108] As a coating material used for the coating layer 43 of the wrapper 41, polyvinyl alcohol (PVA), which is a resin, was used. This polyvinyl alcohol was applied to one of the surfaces of the base sheet 42 using a flexography coater, thereby forming the wrapper 41. The amount of polyvinyl alcohol applied to the base sheet 42 (an amount of coating) was 3.8 g/m².

[0109] The total basis weight of this wrapper 41 was 40 g/m². The opacity of the wrapper 41 including the base sheet 42 and the coating layer 43 was 80%. The whiteness of this wrapper 41 was 88%.

[0110] The diffusion coefficient of the wrapper 41 was 0.000 cm/s. The ventilation level of the wrapper 41 was less than 1 CORESTA unit. The stain occurrence rate was 0%, and there was the stain suppression effect ("O"). There was the crystal suppression effect ("O").

[Example 3]

[0111] As the base sheet 42, a piece of base paper of common tipping paper (TP base paper) also used in traditional cigarettes was used. The basis weight of this base sheet 42 was 36 g/m².

[0112] As a coating material used for the coating layer 43 of the wrapper 41, ethylene-vinyl acetate copolymer (EVA), which is a resin, was used. This ethylene-vinyl acetate copolymer was applied to one of the surfaces of the base sheet 42 using a coater, thereby forming the wrapper 41. The amount of ethylene-vinyl acetate copolymer applied to the base sheet 42 (an amount of coating) was 4.5 g/m².

[0113] The total basis weight of this wrapper 41 was 41 g/m². The opacity of the wrapper 41 including the base sheet 42 and the coating layer 43 was 81%. The whiteness of this wrapper 41 was 89%.

[0114] The diffusion coefficient of the wrapper 41 was 0.022 cm/s. The ventilation level of the wrapper 41 was

less than 1 CORESTA unit. The stain occurrence rate was 1.5%, and there was the stain suppression effect ("O"). There was the crystal suppression effect ("O").

5 [Example 4]

[0115] As the base sheet 42, glassine paper was used. The basis weight of this base sheet 42 was 35 g/m².

10 **[0116]** There was no coating layer 43 in this wrapper 41, and therefore no coating material was used. The total basis weight of this wrapper 41, namely the base sheet 42, was the same, 35 g/m², as that of glassine paper. The opacity of the wrapper 41, namely the base sheet 42, was 14%. The whiteness of the wrapper 41, namely the base sheet 42, was 74%.

15 **[0117]** The diffusion coefficient of the wrapper 41, namely the base sheet 42, was 0.006 cm/s. The ventilation level of the wrapper 41, namely the base sheet 42, was 0.7 CORESTA units, which is less than 1 CORESTA unit. The stain occurrence rate was 0%, and there was the stain suppression effect ("O"). There was the crystal suppression effect ("O").

[Example 5]

25 **[0118]** The wrapper 42 has a first base sheet 42 on the outer side and a second base sheet 42A on the inner side. One of the surfaces of the second base sheet 42A is provided with a coating layer 43. As the first base sheet 42, TP base paper was used. The basis weight of this base sheet 42 was 37 g/m². As the second base sheet 42A, a non-woven fabric called "P1000C" was used. The basis weight of this base sheet 42A was 24 g/m².

30 **[0119]** As a coating material used for the coating layer 43 of the wrapper 41, polyvinyl acetate (PVAc), which is a resin, was used. This polyvinyl acetate was applied to one of the surfaces of the base sheet 42 or the base sheet 42A using a coater, and the base sheet 42 or the base sheet 42A was superposed on the polyvinyl acetate to form the wrapper 41. The amount of polyvinyl acetate applied to the base sheet 42 or the base sheet 42A (an amount of coating) was 1.1 g/m².

35 **[0120]** The total basis weight of this wrapper 41 was 62 g/m². The opacity of this wrapper 41 was 80%. The whiteness of this wrapper 41 was 86%.

40 **[0121]** The diffusion coefficient of the wrapper 41 was 0.015 cm/s. The ventilation level of the wrapper 41 was 2.3 CORESTA units. The stain occurrence rate was 0%, and there was the stain suppression effect ("O"). There was the crystal suppression effect ("O").

[Example 6]

45 **[0122]** The base sheet 42 has a first base sheet 42 on the outer side and a second base sheet 42A on the inner side. One of the surfaces of the second base sheet 42A is provided with a coating layer 43. As the first base sheet 42, TP base paper was used. The basis weight of this

base sheet 42 was 37 g/m². As the second base sheet 42A, glassine paper was used. The basis weight of this base sheet 42A was 25 g/m².

[0123] As a coating material used for the coating layer 43 of the wrapper 41, polyvinyl acetate (PVAc), which is a resin, was used. This polyvinyl acetate was applied to one of the surfaces of the base sheet 42 or the base sheet 42A using a coater, and the base sheet 42 or the base sheet 42A was superposed on the polyvinyl acetate to form the wrapper 41. The amount of polyvinyl acetate applied to the base sheet 42 or the base sheet 42A (an amount of coating) was 1.9 g/m².

[0124] The total basis weight of this wrapper 41 was 64 g/m². The opacity of this wrapper 41 was 81%. The whiteness of this wrapper 41 was 86%.

[0125] The diffusion coefficient of the wrapper 41 was 0.001 cm/s. The ventilation level of the wrapper 41 was 0.7 CORESTA units. The stain occurrence rate was 0%, and there was the stain suppression effect ("O"). There was the crystal suppression effect ("O").

[Example 7]

[0126] The base sheet 42 has a first base sheet 42 on the outer side and a second base sheet 42A on the inner side. One of the surfaces of the second base sheet 42A is provided with a coating layer 43. As the first base sheet 42, paper used as rolling paper for rolling the tobacco filler 23 in a cylindrical shape or a wrapper for rolling a filter in a cylindrical shape in traditional cigarettes (the product name: NPNP1) was used. This NPNP1 is commercially available from paper makers. The basis weight of this base sheet 42 was 35 g/m². As the second base sheet 42A, glassine paper was used. The basis weight of this base sheet 42A was 25 g/m².

[0127] As a coating material used for the coating layer 43 of the wrapper 41, polyvinyl acetate (PVAc), which is a resin, was used. This polyvinyl acetate was applied to one of the surfaces of the base sheet 42 or the base sheet 42A using a coater, and the base sheet 42 or the base sheet 42A was superposed on the polyvinyl acetate to form the wrapper 41. The amount of polyvinyl acetate applied to the base sheet 42 or the base sheet 42A (an amount of coating) was 1.8 g/m².

[0128] The total basis weight of this wrapper 41 was 62 g/m². The opacity of this wrapper 41 was 78%. The whiteness of this wrapper 41 was 89%.

[0129] The diffusion coefficient of the wrapper 41 was 0.003 cm/s. The ventilation level of the wrapper 41 was 1.5 CORESTA units. The stain occurrence rate was 0%, and there was the stain suppression effect ("O"). There was the crystal suppression effect ("O").

[Example 8]

[0130] The base sheet 42 has a first base sheet 42 on the outer side and a second base sheet 42A on the inner side. One of the surfaces of the second base sheet 42A

is provided with a coating layer 43. As the first base sheet 42, TP base paper was used. The basis weight of this base sheet 42 was 37 g/m². As the second base sheet 42A, TP base paper was used. The basis weight of this base sheet 42 was 37 g/m².

[0131] As a coating material used for the coating layer 43 of the wrapper 41, polyvinyl acetate (PVA), which is a resin, was used. This polyvinyl acetate was applied to one of the surfaces of the base sheet 42 or the base sheet 42A using a coater, and the base sheet 42 or the base sheet 42A was superposed on the polyvinyl acetate to form the wrapper 41. The amount of polyvinyl acetate applied to the base sheet 42 (an amount of coating) was 1.5 g/m².

[0132] The total basis weight of this wrapper 41 was 76 g/m². The opacity of this wrapper 41 was 87%. The whiteness of this wrapper 41 was 88%.

[0133] The diffusion coefficient of the wrapper 41 was 0.009 cm/s. The ventilation level of the wrapper 41 was 1.0 CORESTA unit. The stain occurrence rate was 0%, and there was the stain suppression effect ("O"). There was the crystal suppression effect ("O").

[Comparative Example 1]

[0134] As the base sheet 42, paper used as rolling paper for rolling the tobacco filler 23 in a cylindrical shape or a wrapper for rolling a filter in a cylindrical shape in traditional cigarettes (the product name: NPNP1) was used. This NPNP1 is commercially available from paper makers. The basis weight of this base sheet 42 was 35 g/m². Neither resin nor thickening agent was applied to this base sheet 42, and the wrapper 41 of Comparative Example 1 did not have the coating layer 43. The opacity of this wrapper 41 (base sheet 42) was 83%. The whiteness of this wrapper 41 was 94%.

[0135] The diffusion coefficient of the wrapper 41 was 1.009 cm/s. The ventilation level of the wrapper 41 was 15 CORESTA units. The stain occurrence rate was 100%, and there was no stain suppression effect ("X"). There was no crystal suppression effect ("X").

[Comparative Example 2]

[0136] As the base sheet 42, a piece of base paper of common tipping paper (TP base paper) also used in traditional cigarettes was used. The basis weight of this base sheet 42 was 36 g/m². Neither resin nor thickening agent was applied to this base sheet 42, and the wrapper 41 of Comparative Example 2 did not have the coating layer 43. The opacity of this wrapper 41 (base sheet 42) was 79%. The whiteness of this wrapper 41 was 86%.

[0137] The diffusion coefficient of the wrapper 41 was 0.101 cm/s. The ventilation level of the wrapper 41 was less than 1 CORESTA unit. The stain occurrence rate was 100%, and there was no stain suppression effect ("X"). There was no crystal suppression effect ("X").

[Comparative Example 3]

[0138] As the base sheet 42, paper (the product name: NPNP1) was used. The basis weight of this base sheet 42 was 35 g/m². As a coating material used for the coating layer 43 of the wrapper 41, polyvinyl alcohol (PVA), which is a resin, was used. This polyvinyl alcohol was applied to one of the surfaces of the base sheet 42 using a dye coater, thereby forming the wrapper 41. The amount of polyvinyl alcohol applied to the base sheet 42 (an amount of coating) was 1.2 g/m². The opacity of this wrapper 41 was 83%. The whiteness of this wrapper 41 was 94%.

[0139] The diffusion coefficient of the wrapper 41 was 0.599 cm/s. The ventilation level of the wrapper 41 was 8.5 CORESTA units. The stain occurrence rate was 100%, and there was no stain suppression effect ("X"). There was no crystal suppression effect ("X").

[Comparative Example 4]

[0140] As the base sheet 42, paper (product name: NPNP1) was used. The basis weight of this base sheet 42 was 35 g/m². As a coating material used for the coating layer 43 of the wrapper 41, pectin, which is a thickening agent, was used. This pectin was applied to one of the surfaces of the base sheet 42 using a gravure coater, thereby forming the wrapper 41. The amount of pectin applied to the base sheet 42 (an amount of coating) was 0.7 g/m². The opacity of this wrapper 41 was 82%. The whiteness of this wrapper 41 was 93%.

[0141] The diffusion coefficient of the wrapper 41 was 0.358 cm/s. The ventilation level of the wrapper 41 was 4.8 CORESTA units. The stain occurrence rate was 100%, and there was no stain suppression effect ("X"). There was no crystal suppression effect ("X").

[Comparative Example 5]

[0142] As the base sheet 42, a paper called "FXASNP" was used. FXASNP is made from fibrillated wood pulp. The basis weight of this base sheet 42 was 36 g/m². As a coating material used for the coating layer 43 of the wrapper 41, pectin, which is a thickening agent, was used. This pectin was applied to one of the surfaces of the base sheet 42 using a gravure coater, thereby forming the wrapper 41. The amount of pectin applied to the base sheet 42 (an amount of coating) was 0.2 g/m². The opacity of this wrapper 41 was 75%. The whiteness of this wrapper 41 was 86%.

[0143] The diffusion coefficient of the wrapper 41 was 1.352 cm/s. The ventilation level of the wrapper 41 was 12.6 CORESTA units. The stain occurrence rate was 100%, and there was no stain suppression effect ("X"). There was no crystal suppression effect ("X").

[Comparative Example 6]

[0144] The base sheet 42 has a first base sheet 42 on

the outer side and a second base sheet 42A on the inner side. One of the surfaces of the second base sheet 42A is provided with a coating layer 43. As the first base sheet 42, a paper called "NPNP1" was used. The basis weight of this base sheet 42 was 35 g/m². As the second base sheet 42A, P10000C was used. The basis weight of this base sheet 42A was 24 g/m².

[0145] As a coating material used for the coating layer 43 of the wrapper 41, polyvinyl acetate (PVAc), which is a resin, was used. This polyvinyl acetate was applied to one of the surfaces of the base sheet 42 or the base sheet 42A using a coater, and the base sheet 42 or the base sheet 42A was superposed on the polyvinyl acetate to form the wrapper 41. The amount of polyvinyl acetate applied to the base sheet 42 or the base sheet 42A (an amount of coating) was 1.8 g/m².

[0146] The total basis weight of this wrapper 41 was 61 g/m². The opacity of this wrapper 41 was 83%. The whiteness of this wrapper 41 was 88%.

[0147] The diffusion coefficient of the wrapper 41 was 0.245 cm/s. The ventilation level of the wrapper 41 was 5.7 CORESTA units. The stain occurrence rate was 0%, and there was the stain suppression effect ("O"). There was no crystal suppression effect ("X").

[Discussion]

[0148] From the examination of the above-described Examples 1 to 8 and Comparative Examples 1 to 6, the following can be said.

[0149] The diffusion coefficient of the wrapper 41 in the Comparative Example 1 is 1 cm/s or greater, which is greater than the diffusion coefficient in Examples 1 to 8. The diffusion coefficient of the wrapper 41 of the Comparative Example 2 is 0.101 cm/s or greater, which is greater than the diffusion coefficient in Examples 1 to 8. The diffusion coefficient of the wrapper 41 in the Comparative Examples 3 to 6 is 0.245 cm/s or greater, which is greater than the diffusion coefficient in Examples 1 to 8. The lower limit of the diffusion coefficient in Comparative Examples 1 to 6 is 0.101 cm/s, which is the diffusion coefficient in Comparative Example 2. For this reason, in order to have the stain suppression effect and the crystal suppression effect, it is realized that the diffusion coefficient of the wrapper 41 needs to be less than at least 0.101 cm/s. Particularly, the wrapper 41 having the diffusion coefficient of 0 cm/s to 0.022 cm/s is realized as an example having the stain suppression effect and the crystal suppression effect, as in Examples 1 to 8. The upper limit of the diffusion coefficient of the wrapper 41 falls within the range from 0.022 cm/s to 0.101 cm/s.

[0150] Thus, it is recognized that the diffusion coefficient of the wrapper 41 makes a great contribution to the stain suppression effect and the crystal suppression effect. It was found that the diffusion coefficient of the wrapper 41 is 0 cm/s or greater, and an upper limit of the diffusion coefficient is between 0.022 cm/s and 0.10 cm/s.

[0151] In six out of eight examples of Examples 1-8, the ventilation level was lower than 1 CORESTA unit, and the highest value was 2.3 CORESTA units in Example 5. As to the ventilation level in Comparative Examples 1 to 6, it was less than 1 CORESTA unit in Comparative Example 2 but it was 4.8 CORESTA units or greater in the rest of the examples. For this reason, the ventilation level in Examples 1 to 8 is lower than the ventilation level in the comparative examples. In other words, although there is a relationship between the ventilation level and the diffusion coefficient, it is preferable that the ventilation level be 1 CORESTA unit or lower, for example.

[0152] It was found that the coating layer 43 is not always necessary and the material of the coating layer 43 is irrelevant as long as it is a non-metal resin (polyvinyl alcohol, polyvinyl acetate) or a thickening agent (arabic gum). This finding suggests that the coating agent that consists of the coating layer 43 can be of any composition as long as the coating agent can invade into micro pores of the base sheet 42 and become solid therein so as to clog the micro pores. Furthermore, as in Examples 1 to 4, it was found that a standard ventilation level of a two- or single-layer wrapper 41 having the base sheet 42 but not base sheet 42A is less than 1 CORESTA unit.

[0153] In Comparative Example 6, NPNP1 was used as the base sheet 42 and P1000C was used as the base sheet 42A. Although the amount of coating in the coating layer 43 differs, the base sheet 42 used in Comparative Example 6 differs from that in Comparative Example 5. It is assumed that NPNP1 contributes to the increase in the diffusion coefficient and the ventilation level, compared to the TP base paper. For this reason, it can be said that the selection of not only the base sheet 42A in the inner side but also the base sheet 42 in the outer side is also crucial for the wrapper 41.

[0154] The present invention is not limited to the above described embodiments and various modifications can be made without departing from the scope of the present invention as defined in the appended claims. The respective embodiments may be appropriately combined and implemented as much as possible, in which case a combined effect is obtained.

REFERENCE SIGNS LIST

[0155] 11... electric-heating flavor inhaling system, 12...mainbody, 14...rod, 23...tobacco filler, 24...tobacco part, 24A...first end surface, 24B...second end surface, 25...suction port, 26...filterpart, 27...connecting part, 41...wrapper, 41A... one end, 41B...other end, 42...base sheet, 43...coating layer, 44...overlapping part, 45...adhesive, 46...non-formation area, 47...bonding surface, 51...additional segment, 51A...hollow part

Claims

1. A non-combustible-heating flavor inhaling article

comprising:

a tobacco part (24) that has:

5 a tobacco filler (23) that includes a tobacco filling material and a volatile flavor; and a wrapper (41) surrounding the tobacco filler,

10 wherein, when a diffusion coefficient is measured by the Diffusivity Tester manufactured by the Borgwaldt company, using N₂ and CO₂ as gas and under a temperature of 22 °C and a relative humidity of 60% as measurement conditions, the diffusion coefficient of the wrapper is 0 cm/s or greater, and an upper limit of the diffusion coefficient is between 0.022 cm/s and 0.10 cm/s, wherein the tobacco filler includes 5 weight % to 30 weight% of an aerosol-generating base material with respect to a weight of the tobacco filling material.

25 2. The non-combustible-heating flavor inhaling article according to claim 1, wherein the diffusion coefficient of the wrapper (41) falls under a range of 0 cm/s to 0.022 cm/s.

30 3. The non-combustible-heating flavor inhaling article according to claim 1 or 2, wherein the wrapper (41) has a paper-made and/or non-woven fabric-made base sheet having the diffusion coefficient.

35 4. The non-combustible-heating flavor inhaling article according to claim 1 or 2, wherein the wrapper (41) has a paper-made and/or non-woven fabric-made base sheet (42) and a non-metal coating layer (43) provided in the base sheet, and the diffusion coefficient is defined by the base sheet and the coating layer.

45 5. The non-combustible-heating flavor inhaling article according to claim 4, wherein the base sheet (42) has a first base sheet made of a paper or non-woven fabric and a second base sheet made of a paper or non-woven fabric, and the coating layer (43) is interposed between the first sheet and the second sheet.

55 6. The non-combustible-heating flavor inhaling article according to claim 4, wherein the coating layer (43) is provided on a surface of the

- base sheet on which the tobacco filler (23) is abutted.
7. The non-combustible-heating flavor inhaling article according to claim 4, wherein the coating layer contains a resin, a thickening agent, or a mixture thereof. 5
8. The non-combustible-heating flavor inhaling article according to claim 7, wherein the resin is polyvinyl alcohol, ethylene-vinyl acetate copolymer, or polyvinyl acetate. 10
9. The non-combustible-heating flavor inhaling article according to claim 7, wherein the thickening agent is arabic gum, starch, sodium alginate, pectin, carboxymethyl cellulose, methylcellulose, ethyl cellulose, or hydroxypropyl methyl cellulose (HPMC). 15
10. The non-combustible-heating flavor inhaling article according to claim 4, wherein the coating layer (43) further includes a filler. 20
11. The non-combustible-heating flavor inhaling article according to claim 10, wherein the filler is calcium carbonate, aluminum hydroxide, aluminum oxide, titanium dioxide, microcrystalline cellulose, kaolin, talc, or silica. 25
12. The non-combustible-heating flavor inhaling article according to any one of claims 1 to 4, wherein the volatile flavor is 1-menthol. 30
13. The non-combustible-heating flavor inhaling article according to any one of claims 1 to 4, wherein the tobacco filler includes 1.2 weight% of the volatile flavor with respect to the weight of the tobacco filling material. 35
14. An electric-heating flavor inhaling system (11) comprising: 40
- a non-combustible-heating flavor inhaling article according to any one of claims 1 to 4; and 45
- a heater (21) configured to heat the non-combustible-heating flavor inhaling article.

Patentansprüche

1. Geschmacksinhalationsartikel ohne Verbrennung, umfassend: 50
- einen Tabakteil (24), der Folgendes aufweist:
- einen Tabakfüllstoff (23), der ein Tabakfüllmaterial und einen flüchtigen Geschmack einschließt; und 55
2. Geschmacksinhalationsartikel ohne Verbrennung nach Anspruch 1, wobei der Diffusionskoeffizient der Umhüllung (41) in einem Bereich von 0 cm/s bis 0,022 cm/s liegt.
3. Geschmacksinhalationsartikel ohne Verbrennung nach Anspruch 1 oder 2, wobei die Umhüllung (41) ein aus Papier und/oder Vliesstoff hergestelltes Basisblatt aufweist, das den Diffusionskoeffizienten aufweist.
4. Geschmacksinhalationsartikel ohne Verbrennung nach Anspruch 1 oder 2, wobei die Umhüllung (41) ein aus Papier und/oder Vliesstoff hergestelltes Basisblatt (42) und eine in dem Basisblatt bereitgestellte nichtmetallische Beschichtungsschicht (43) aufweist, und der Diffusionskoeffizient durch das Basisblatt und die Beschichtungsschicht definiert ist.
5. Geschmacksinhalationsartikel ohne Verbrennung nach Anspruch 4, wobei das Basisblatt (42) ein erstes Basisblatt, hergestellt aus einem Papier oder Vliesstoff, und ein zweites Basisblatt, hergestellt aus einem Papier oder Vliesstoff, aufweist, und die Beschichtungsschicht (43) zwischen dem ersten Blatt und dem zweiten Blatt eingefügt ist.
6. Geschmacksinhalationsartikel ohne Verbrennung nach Anspruch 4, wobei die Beschichtungsschicht (43) auf einer Oberfläche des Basisblatts bereitgestellt ist, an die der Tabakfüllstoff (23) angrenzt.
7. Geschmacksinhalationsartikel ohne Verbrennung nach Anspruch 4, wobei die Beschichtungsschicht ein Harz, ein Verdickungsmittel oder eine Mischung

davon enthält.

8. Geschmacksinhalationsartikel ohne Verbrennung nach Anspruch 7, wobei das Harz Polyvinylalkohol, Ethylen-Vinylacetat-Copolymer oder Polyvinylacetat ist. 5
9. Geschmacksinhalationsartikel ohne Verbrennung nach Anspruch 7, wobei das Verdickungsmittel Gummi arabicum, Stärke, Natriumalginat, Pektin, Carboxymethylcellulose, Methylcellulose, Ethylcellulose oder Hydroxypropylmethylcellulose (HPMC) ist. 10
10. Geschmacksinhalationsartikel ohne Verbrennung nach Anspruch 4, wobei die Beschichtungsschicht (43) weiter einen Füllstoff einschließt. 15
11. Geschmacksinhalationsartikel ohne Verbrennung nach Anspruch 10, wobei der Füllstoff Calciumcarbonat, Aluminiumhydroxid, Aluminiumoxid, Titandioxid, mikrokristalline Cellulose, Kaolin, Talk oder Kieselsäure ist. 20
12. Geschmacksinhalationsartikel ohne Verbrennung nach einem der Ansprüche 1 bis 4, wobei der flüchtige Geschmack 1-Menthol ist. 25
13. Geschmacksinhalationsartikel ohne Verbrennung nach einem der Ansprüche 1 bis 4, wobei der Tabakfüllstoff 1,2 Gewichts% des flüchtigen Geschmacks in Bezug auf das Gewicht des Tabakfüllmaterials einschließt. 30
14. Geschmacksinhalationsystem mit elektrischer Heizung (11), umfassend: 35
- einen Geschmacksinhalationsartikel ohne Verbrennung nach einem der Ansprüche 1 bis 4; und 40
- eine Heizvorrichtung (21), die dazu konfiguriert ist, den Geschmacksinhalationsartikel ohne Verbrennung zu erhitzen. 45

Revendications

1. Article d'inhalation d'arôme à chauffage sans combustible comprenant : 50
- une partie tabac (24) qui présente :
- une charge (23) de tabac qui inclut un matériau de charge de tabac et un arôme volatil ; et 55
- une enveloppe (41) entourant la charge de tabac,

dans lequel,

lorsqu'un coefficient de diffusion est mesuré par un Testeur de Diffusivité fabriqué par la société Borgwaldt, utilisant du N₂ et du CO₂ comme gaz et sous une température de 22 °C et une humidité relative de 60 % en tant que conditions de mesure,

le coefficient de diffusion de l'enveloppe est de 0 cm/s ou plus, et

une limite supérieure du coefficient de diffusion est entre 0,022 cm/s et 0,10 cm/s, dans lequel la charge de tabac inclut de 5 % en poids à 30 % en poids d'un matériau de base générateur d'aérosol par rapport à un poids du matériau de charge de tabac.

2. Article d'inhalation d'arôme à chauffage sans combustible selon la revendication 1, dans lequel le coefficient de diffusion de l'enveloppe (41) tombe sous une plage de 0 cm/s à 0,022 cm/s.

3. Article d'inhalation d'arôme à chauffage sans combustible selon la revendication 1 ou la revendication 2, dans lequel l'enveloppe (41) présente une feuille de base composée de papier et/ou composée de tissu non tissé présentant le coefficient de diffusion.

4. Article d'inhalation d'arôme à chauffage sans combustible selon la revendication 1 ou la revendication 2, dans lequel

l'enveloppe (41) présente une feuille de base (42) composée de papier et/ou composée de tissu non tissé et une couche de revêtement non métallique (43) située dans la feuille de base, et le coefficient de diffusion est défini par la feuille de base et la couche de revêtement.

5. Article d'inhalation d'arôme à chauffage sans combustible selon la revendication 4, dans lequel

la feuille de base (42) présente une première feuille de base composée d'un papier ou d'un tissu non tissé et une seconde feuille de base composée d'un papier ou d'un tissu non tissé, et la couche de revêtement (43) est intercalée entre la première feuille et la seconde feuille.

6. Article d'inhalation d'arôme à chauffage sans combustible selon la revendication 4, dans lequel la couche de revêtement (43) est disposée sur une surface de la feuille de base contre laquelle la charge (23) de tabac vient en butée.

7. Article d'inhalation d'arôme à chauffage sans combustible selon la revendication 4, dans lequel la couche de revêtement contient une résine, un agent épaississant, ou un mélange de ceux-ci.

8. Article d'inhalation d'arôme à chauffage sans combustible selon la revendication 7, dans lequel la résine est un alcool polyvinylique, un copolymère d'éthylène-acétate de vinyle, ou un acétate polyvinylique. 5
9. Article d'inhalation d'arôme à chauffage sans combustible selon la revendication 7, dans lequel l'agent épaississant est une gomme arabique, de l'amidon, un alginat de sodium, une pectine, une carboxyméthylcellulose, une méthylcellulose, une éthylcellulose, ou une hydroxypropylméthylcellulose (HPMC). 10
10. Article d'inhalation d'arôme à chauffage sans combustible selon la revendication 4, dans lequel la couche de revêtement (43) inclut en outre une charge. 15
11. Article d'inhalation d'arôme à chauffage sans combustible selon la revendication 10, dans lequel la charge est du carbonate de calcium, de l'hydroxyde d'aluminium, de l'oxyde d'aluminium, du dioxyde de titane, de la cellulose microcristalline, du kaolin, du talc ou de la silice. 20
12. Article d'inhalation d'arôme à chauffage sans combustible selon l'une quelconque des revendications 1 à 4, dans lequel l'arôme volatil est du 1-menthol. 25
13. Article d'inhalation d'arôme à chauffage sans combustible selon l'une quelconque des revendications 1 à 4, dans lequel la charge de tabac inclut 1,2 % en poids de l'arôme volatil par rapport au poids du matériau de charge de tabac. 30
14. Système (11) d'inhalation d'arôme à chauffage électrique comprenant : 35
- un article d'inhalation d'arôme à chauffage sans combustible selon l'une quelconque des revendications 1 à 4 ; et 40
- un élément chauffant (21) configuré pour chauffer l'article d'inhalation d'arôme à chauffage sans combustible.

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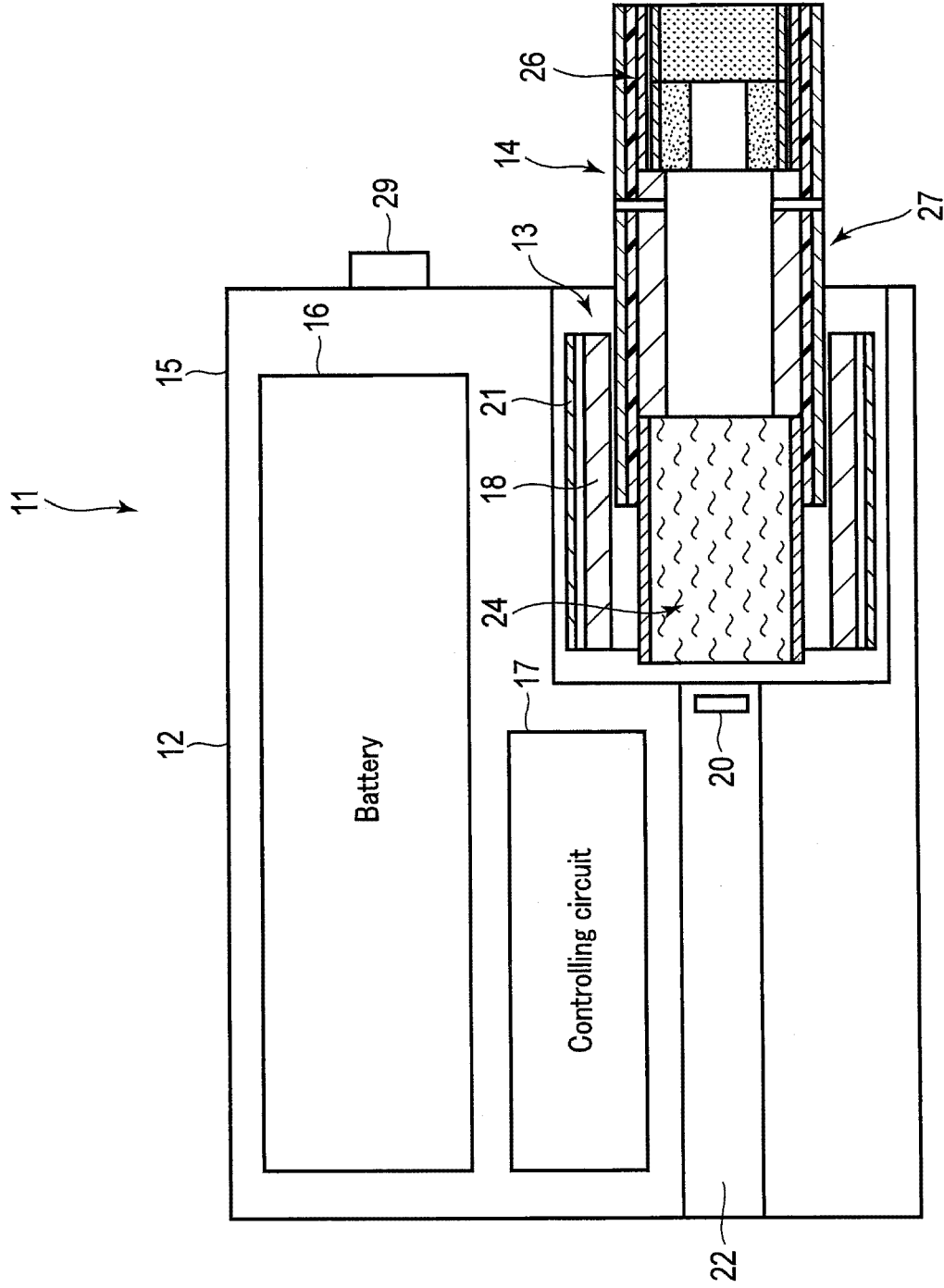


FIG. 1

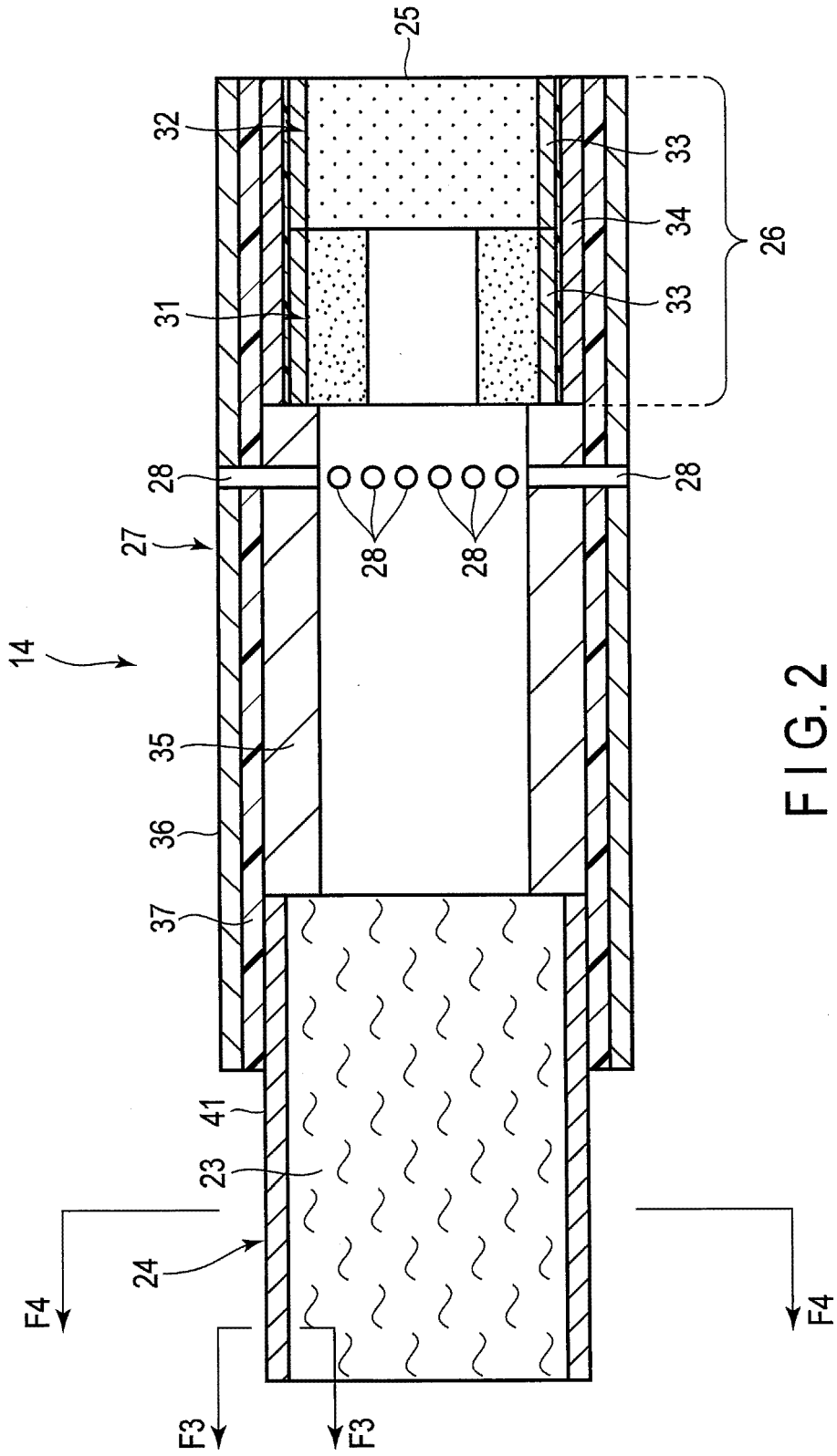


FIG. 2

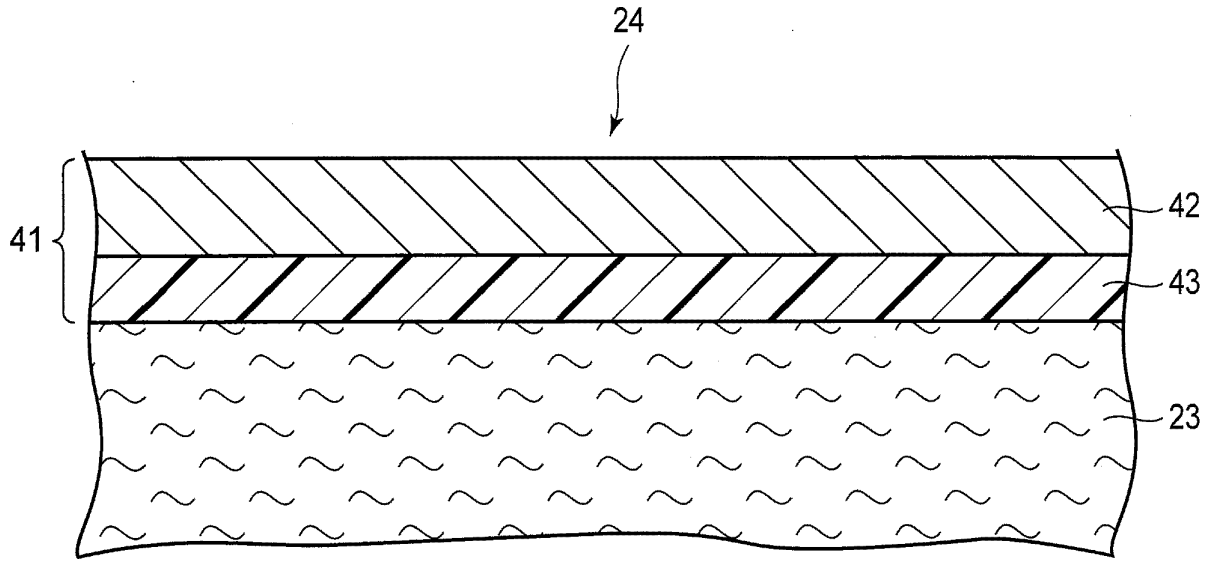


FIG. 3

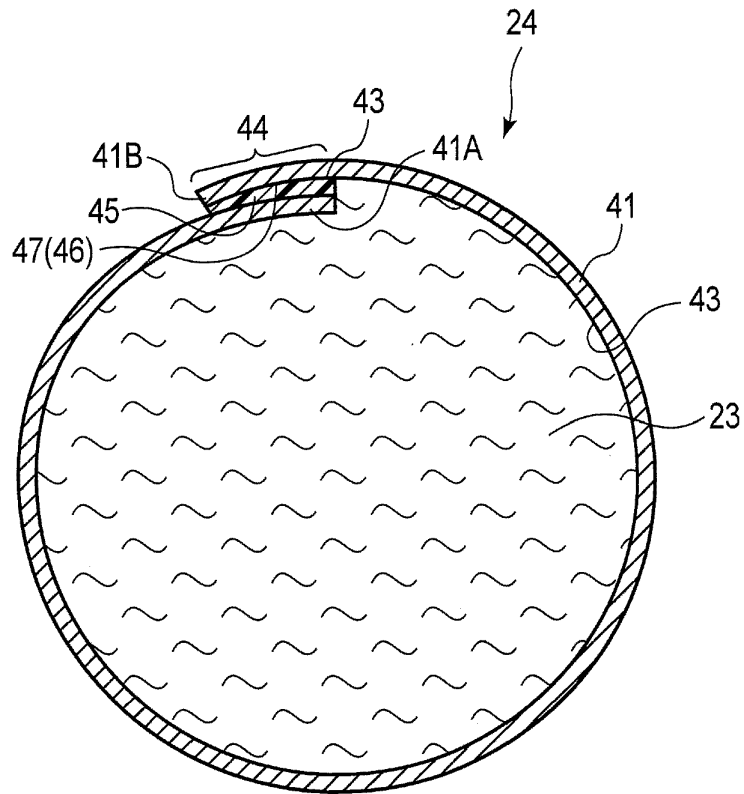


FIG. 4

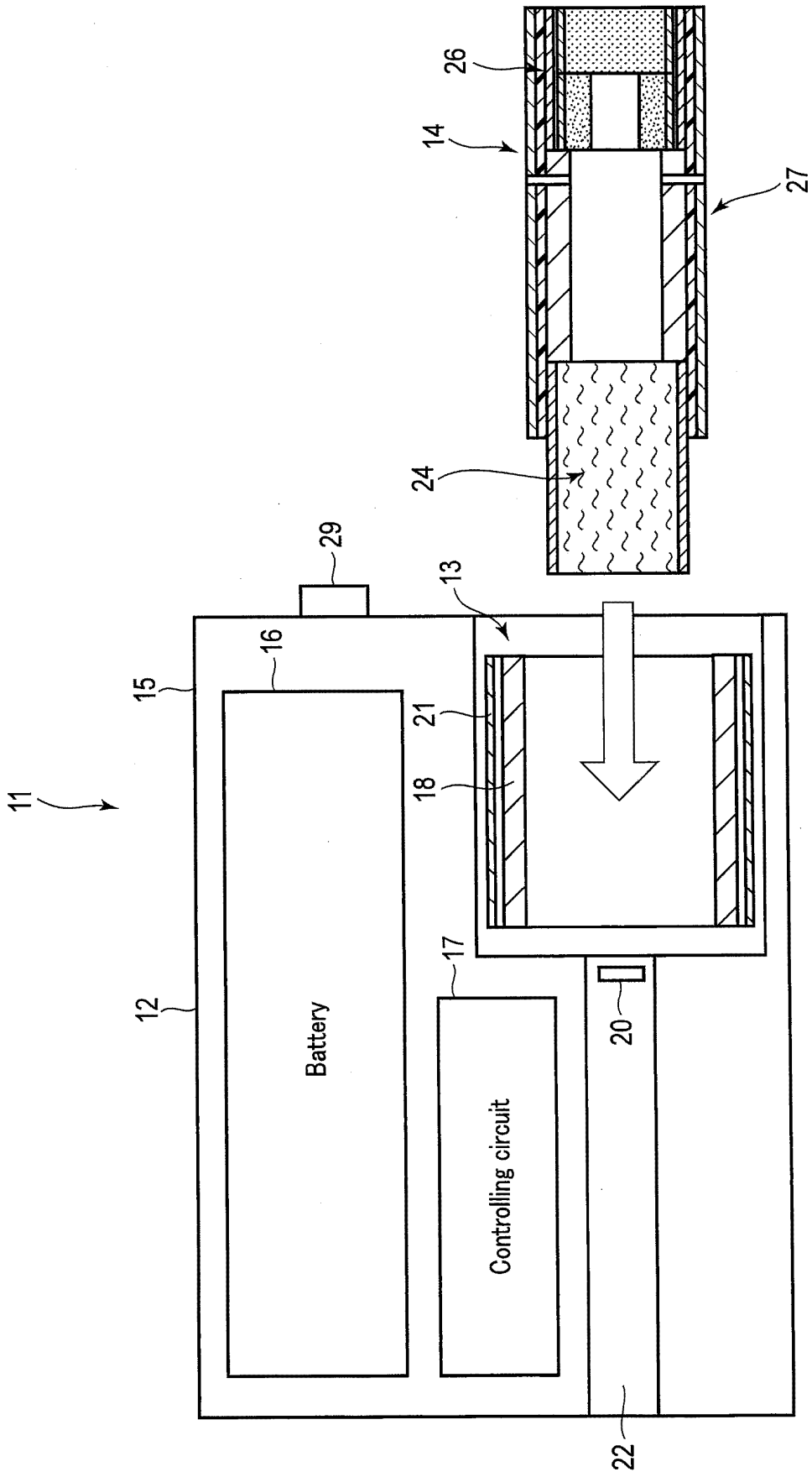


FIG. 5

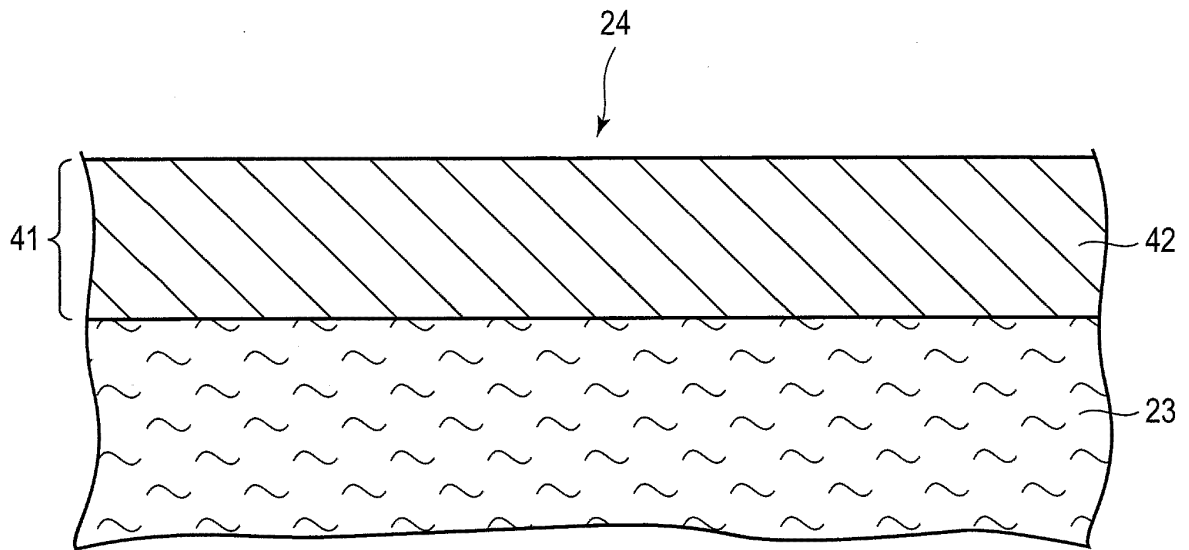


FIG. 6

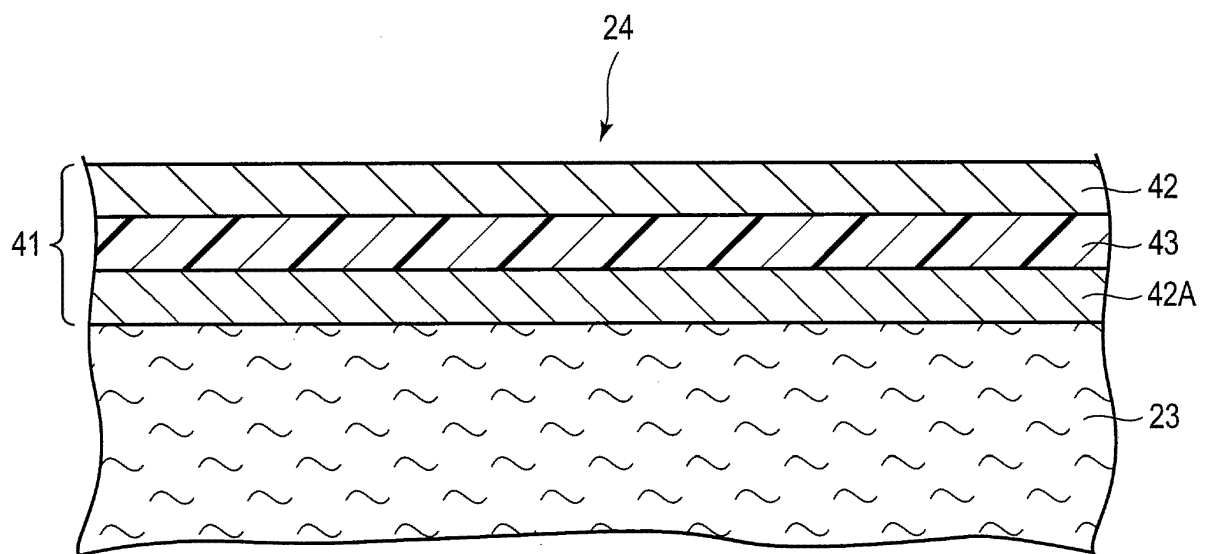


FIG. 7

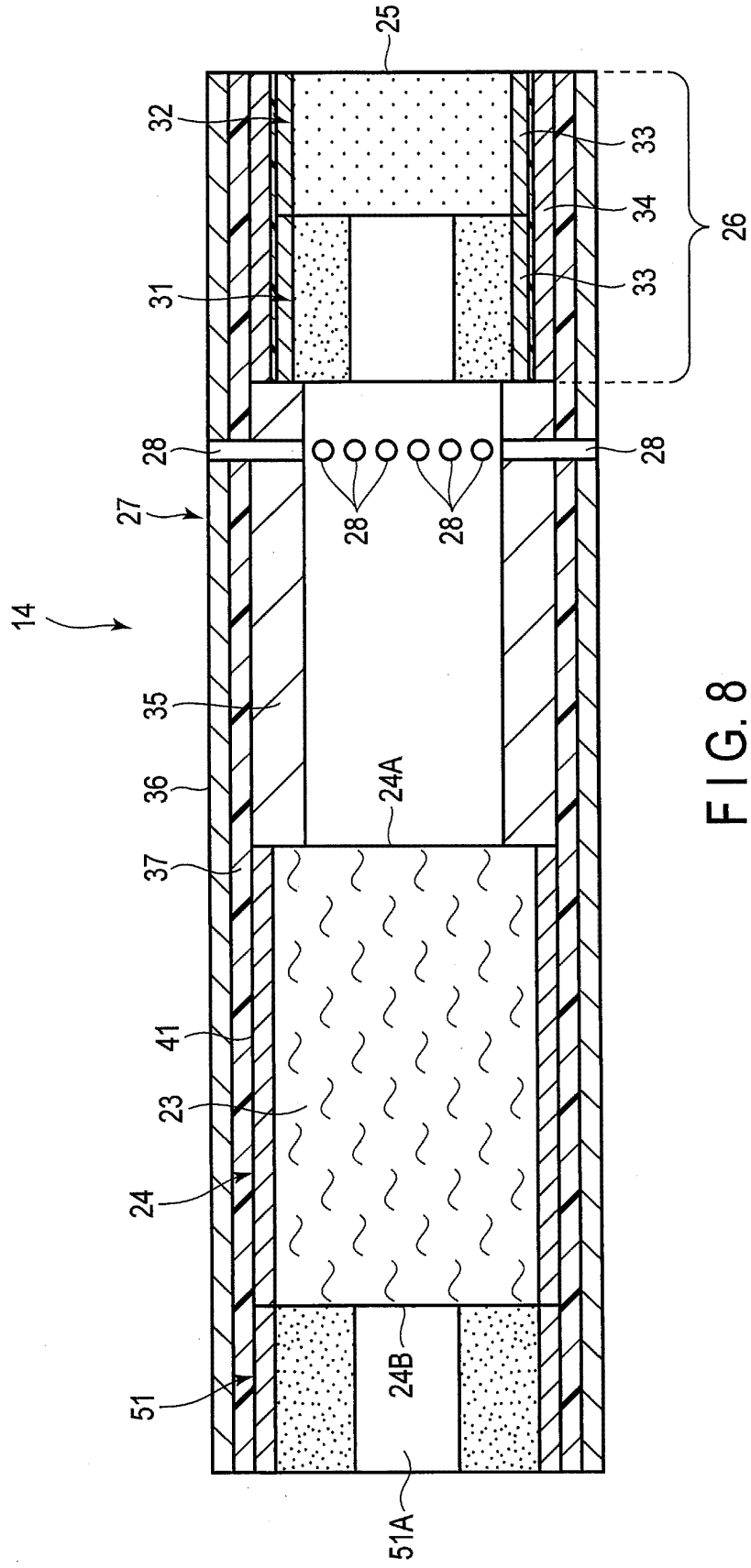


FIG. 8

	Base sheet 1	Basis weight of base sheet 1 (g/m ²)	Base sheet 2	Basis weight of base sheet 2 (g/m ²)	Opacity (%)	Whiteness (%)	Coating material	Amount of coating (g/m ²)	Total basis weight (g/m ²)	Diffusion coefficient (cm/s)	Ventilation level (C.U.)	Stain occurrence rate (%)	Stain suppression effect	Crystal suppression effect
Example 1	TP base paper	36	-	-	81	88	Arabic gum	7.3	43	0.002	<1	27.5	○	○
Example 2	TP base paper	36	-	-	80	88	PVA	3.8	40	0	<1	0	○	○
Example 3	TP base paper	36	-	-	81	89	EVA	4.5	41	0.022	<1	1.5	○	○
Example 4	Glassine paper	35	-	-	14	74	-	-	35	0.006	0.7	0	○	○
Example 5	TP base paper	37	P10000C	24	80	86	PVAc	1.1	62	0.015	2.3	0	○	○
Example 6	TP base paper	37	Glassine paper	25	81	87	PVAc	1.9	64	0.001	0.7	0	○	○
Example 7	NPNP1	35	Glassine paper	25	78	89	PVAc	1.8	62	0.003	1.5	0	○	○
Example 8	TP base paper	37	TP base paper	37	87	88	PVAc	1.5	76	0.009	1.0	0	○	○
Comparative example 1	NPNP1	35	-	-	83	94	-	-	35	1.009	15	100	×	×
Comparative example 2	TP base paper	36	-	-	79	88	-	-	36	0.101	<1	100	×	×
Comparative example 3	NPNP1	35	-	-	83	94	PVA	1.2	36	0.599	8.5	100	×	×
Comparative example 4	NPNP1	35	-	-	82	93	Pectin	0.7	36	0.358	4.8	100	×	×
Comparative example 5	FXASNP	36	-	-	75	86	Pectin	0.2	36	1.352	13	100	×	×
Comparative example 6	NPNP1	35	P10000C	24	83	88	PVAc	1.8	61	0.245	5.7	0	○	×

FIG. 9

REFERENCES CITED IN THE DESCRIPTION

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