



(11)

EP 4 825 193 A1

(12)

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

(43) Date of publication:
21.10.2026 Bulletin 2026/43

(51) International Patent Classification (IPC):
A24D 1/20 ^(2020.01)

(21) Application number: **23961376.3**

(52) Cooperative Patent Classification (CPC):
A24D 1/20

(22) Date of filing: **12.12.2023**

(86) International application number:
PCT/JP2023/044379

(87) International publication number:
WO 2025/126308 (19.06.2025 Gazette 2025/25)

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL
NO PL PT RO RS SE SI SK SM TR**
Designated Extension States:
BA
Designated Validation States:
KH MA MD TN

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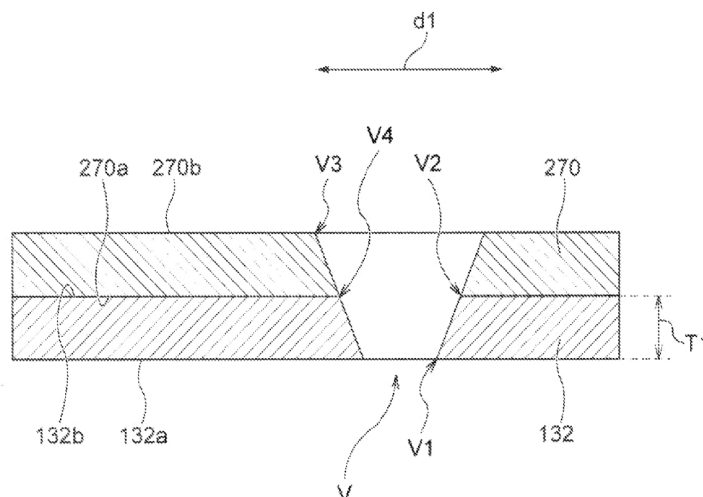
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(54) **FLAVOR-GENERATING ARTICLE**

(57) A flavor-generating article comprises: a flavor-generating portion; a hollow tube portion disposed on a downstream side of the flavor-generating portion; and a perforation formed penetrating the hollow tube portion. The perforation comprises a first perforation portion po-

sitioned on an inner surface of the hollow tube portion, and a second perforation portion positioned on an outer surface of the hollow tube portion. An area of the second perforation portion is greater than an area of the first perforation portion.

[Fig. 5]



Description

TECHNICAL FIELD

[0001] The present invention relates to a flavor-generating article.

BACKGROUND ART

[0002] Aerosol-generating devices which generate an aerosol without burning of materials are conventionally known. An aerosol-generating device includes, for example, a chamber for accommodating the aerosol-generating device, and a heater for heating an aerosol-generating article accommodated in the chamber (see, for example, PTL 1).

CITATION LIST

PATENT LITERATURE

[0003] PTL 1: WO 2021/130191 A1

SUMMARY OF INVENTION

PROBLEM TO BE SOLVED BY THE INVENTION

[0004] As disclosed in PTL 1, it is known for the aerosol-generating article to have a ventilation hole in the package thereof, in order to allow an inflow of air for lowering the temperature of the aerosol generated.

[0005] One objective of the present invention lies in making it easier for a flavor-generating article to take an external air, while also making vapor or aerosol leakage less likely.

SOLUTION TO PROBLEM

[0006] According to a first aspect, a flavor-generating article is provided. This flavor-generating article comprises: a flavor-generating portion; a hollow tube portion disposed on a downstream side of the flavor-generating portion; and a perforation formed penetrating the hollow tube portion. The perforation comprises a first perforation portion positioned on an inner surface of the hollow tube portion, and a second perforation portion positioned on an outer surface of the hollow tube portion. An area of the second perforation portion is greater than an area of the first perforation portion.

[0007] According to the first aspect, air can flow into the hollow tube portion from the outside through the perforation during use of the flavor-generating article, enabling a reduction in the temperature of air and components flowing in from the flavor-generating portion. Here, the area of the second perforation portion is greater than the area of the first perforation portion, so external air is taken in more easily than when the perforation has the area of the first perforation portion over

its entirety. Furthermore, the area of the first perforation portion is smaller than the area of the second perforation portion, so vapor or aerosol generated by the flavor-generating portion can be better inhibited from leaking to the outside from the perforation than when the perforation has the area of the second perforation portion over its entirety.

[0008] The flavor-generating article may comprise a first wrapper covering the hollow tube portion, the perforation may be formed penetrating the hollow tube portion and the first wrapper, the perforation may comprise a third perforation portion positioned on an outer surface of the first wrapper and a fourth perforation portion positioned on an inner surface of the first wrapper, and an area of the third perforation portion may be greater than the area of the first perforation portion.

[0009] In this case, the flavor-generating article has a double structure comprising the hollow tube portion and the first wrapper, therefore making it possible to further increase a difference between the area of the third perforation portion and the area of the first perforation portion. Consequently, the vapor or aerosol generated by the flavor-generating portion can be even better inhibited from leaking to the outside from the perforation, while external air from the perforation is taken in even more easily.

[0010] A shape and area of the fourth perforation portion may be substantially the same as a shape and area of the second perforation portion.

[0011] When the shape and area of the fourth perforation portion are the same as the shape and area of the second perforation portion in this way, the perforation penetrating the hollow tube portion and the first wrapper can be formed at one time by means of a laser or the like. Furthermore, in this case, substantially no step or the like is formed in the boundary region of the perforation between the first wrapper and the hollow tube, so an increase in airflow resistance in this boundary region can be inhibited.

[0012] A shape and area of the fourth perforation portion may be substantially the same as a shape and area of the third perforation portion.

[0013] In this case, a thin sheet with which it is difficult to produce a substantial difference between the area of the fourth perforation portion and the area of the third perforation portion can be used as the first wrapper. This makes it possible to reduce the cost and weight of the flavor-generating article.

[0014] A ratio of the area of the third perforation portion to the area of the first perforation portion may be 1.1 or greater.

[0015] In this case, there is a sufficient difference between the area of the first perforation portion and the area of the third perforation portion, so the vapor or aerosol generated by the flavor-generating portion can be better inhibited from leaking from the perforation, while external air is taken in more easily from the perforation. Moreover, the ratio of the area of the third

perforation portion to the area of the first perforation portion can be 2 or less.

[0016] The flavor-generating article may have an upstream portion disposed on an upstream side of the flavor-generating portion.

[0017] In this case, an end portion of the flavor-generating portion is covered by the upstream portion, which therefore makes it possible to prevent the flavor-generating portion from falling out from the flavor-generating article. Furthermore, the vapor or aerosol generated by the flavor-generating portion can be inhibited from leaking to the upstream side of the flavor-generating portion. There is also a risk here that the vapor or aerosol generated by the flavor-generating portion will stagnate inside the hollow tube portion because of the upstream portion, raising the pressure inside the hollow tube portion. However, according to the first aspect, the vapor or aerosol generated by the flavor-generating portion can be inhibited from leaking from the perforation, even if the pressure inside the hollow tube portion rises.

[0018] The length of the upstream portion in the longitudinal direction may be 5 mm-10 mm.

[0019] If this length is less than 5 mm, there is a risk that it will not be possible to sufficiently inhibit leakage of the vapor or aerosol generated by the flavor-generating article to the upstream side of the flavor-generating portion. There is also a risk here of the upstream portion falling out from the flavor-generating article because it is too short. If the length above exceeds 10 mm, then there is a risk of the flavor-generating article having excessively high airflow resistance. By adopting the range above for the length of the upstream portion, it is therefore possible to sufficiently inhibit leakage of the vapor or aerosol to the upstream side of the flavor-generating portion, while also inhibiting the airflow resistance of the flavor-generating article from becoming excessively high and inhibiting the upstream portion from falling out from the flavor-generating article.

[0020] The thickness of the hollow tube portion may be 5 μm -500 μm .

[0021] If this thickness is less than 5 μm , then the hollow tube portion becomes excessively thin, which can reduce the difference between the area of the first perforation portion and the area of the second perforation portion. If this thickness exceeds 500 μm , then the hollow tube portion becomes excessively thick and considerable energy is needed to form the perforation. In this case, if the perforation is formed by a laser, for example, there is also a risk of scorching the surface. Accordingly, a difference in opening areas is ensured within the numerical range above, thereby allowing external air to be easily taken in and leakage of the vapor or aerosol to be inhibited, while the perforation can also be easily formed. The thickness of the hollow tube portion is preferably 100 μm -300 μm .

[0022] The perforation may be formed in a region between 2 mm and 12 mm from a downstream end

portion of the hollow tube portion in the longitudinal direction.

[0023] In this case, the perforation can not only enhance the cooling capability of the hollow tube portion, but also suppress stagnation of components generated by means of heating inside the hollow tube portion, and increase the amount of delivery of those components. Moreover, when an aerosol base material is contained in the flavor-generating portion, a vapor containing the aerosol base material and the tobacco flavor component generated as a result of the flavor-generating article being heated is liquefied by a reduction in temperature caused by contact with external air, making it possible to promote aerosol generation.

[0024] The flavor-generating article may comprise a filter plug disposed on the downstream side of the hollow tube portion.

[0025] In this case, the vapor or aerosol generated by the flavor-generating portion can be cooled and filtered in the filter plug.

[0026] The first wrapper may cover the filter plug.

[0027] In this case, the hollow tube portion and the filter plug can be joined by means of the first wrapper.

[0028] The flavor-generating article may comprise a second wrapper covering the flavor-generating portion and the hollow tube portion.

[0029] In this case, the hollow tube portion and the flavor-generating portion can be joined by means of the second wrapper.

[0030] The second wrapper may partially overlap the first wrapper.

[0031] In this case, the hollow tube portion and the flavor-generating portion can be more securely joined while the hollow tube portion is prevented from being exposed.

[0032] The first perforation portion or the second perforation portion may be circular, elliptical, elongated elliptical, or rectangular.

[0033] When the perforation has such a shape, the perforation can be easily formed by means of a laser.

[0034] A circumferential length of the first perforation portion or the second perforation portion may be greater than a longitudinal length of the first perforation portion or the second perforation portion.

[0035] In this case, the flow velocity of air flowing into the hollow tube portion can be increased and the cooling capability of the hollow tube portion can be further improved, as compared to when the circumferential length of the first perforation portion (or of the second perforation portion) is the same as the longitudinal length thereof.

BRIEF DESCRIPTION OF DRAWINGS

[0036]

[Fig. 1] is a drawing showing a smoking system according to the embodiment.

[Fig. 2] is a drawing showing a smoking system according another embodiment.

[Fig. 3] is an exploded oblique view of a flavor-generating article.

[Fig. 4] is a schematic view in cross section of the flavor-generating article.

[Fig. 5] is a partial enlargement in cross section of the flavor-generating article shown in fig. 4(a).

EMBODIMENTS OF THE INVENTION

[0037] Embodiments of the present invention will be described below with reference to the drawings. In the drawings described below, identical or corresponding components are assigned the same reference symbols and duplicate descriptions will not be given. Fig. 1 is a drawing showing a smoking system 100 according to the embodiment. As shown in fig. 1, the smoking system 100 comprises a flavor-generating article 110 having a flavor source, and a flavor inhaler 120 for heating the flavor-generating article 110. Air to be inhaled by the user is directed into the oral cavity of the user, for example in the order of air flow 100A, air flow 100C, and air flow 100B. That is to say, the smoking system 100 shown in fig. 1 has what is known as a counterflow-type air flow path.

[0038] The flavor-generating article 110 is a substrate containing a flavor source such as tobacco capable of generating a smokable flavor, and has, for example, a columnar shape extending along the longitudinal direction. The flavor-generating article 110 may be a tobacco stick, for example. The flavor-generating article 110 may have a cylindrical shape, a columnar shape with a polygonal cross section, or a flat shape. It should be noted that "longitudinal direction" in the present specification means a length direction of the flavor-generating article 110, or a direction of adjacency of a tip-end plug 112 and a flavor-generating portion 220 which will be described later.

[0039] The flavor inhaler 120 comprises a battery 10, a control unit 20, and a heating unit 30. The battery 10 stores electric power for use by the flavor inhaler 120. The battery 10 is a lithium ion battery, for example. The battery 10 may be rechargeable by means of an external power source.

[0040] The control unit 20 is configured by a CPU and a memory, etc. and controls operation of the flavor inhaler 120 including the heating unit 30. For example, the control unit 20 starts heating of the flavor-generating article 110 in response to a user operation on an input device such as a push-button or slide switch (not depicted), and terminates heating of the flavor-generating article 110 once a given time has elapsed. When the number of puffing actions by the user has passed a fixed value, the control unit 20 may terminate heating of the flavor-generating article 110 even if the given time has not yet elapsed from the start of heating of the flavor-generating article 110. Puffing actions are de-

tected by a sensor (not depicted), for example.

[0041] Alternatively, the control unit 20 may start heating of the flavor-generating article 110 in response to the start of a puffing action, and may terminate heating of the flavor-generating article 110 in response to the end of the puffing action. When a given time has elapsed from the start of the puffing action, the control unit 20 may terminate heating of the flavor-generating article 110 even if the puffing action has not yet finished. In the embodiment, the control unit 20 is disposed between the battery 10 and the heating unit 30, and inhibits transfer of heat from the heating unit 30 to the battery 10.

[0042] The heating unit 30 may be configured to accommodate the flavor-generating article 110. The heating unit 30 furthermore comprises a heating source 40. The heating source 40 is a heat-generating body which generates heat by means of electrical power from the battery 10, which is to say that the temperature thereof rises. In the example depicted, the heating source 40 is a heater arranged in the flavor inhaler 120. The heater may comprise a heating wire. Furthermore, the heater may equally be configured to generate heat by means of an induction coil (not shown). The heater is configured to heat the flavor-generating article 110 accommodated in the heating unit 30 from the outside of the flavor-generating article 110. The flavor inhaler 120 is thus a flavor inhaler of what is known as the external heating type. Note that the flavor-generating article 110 may have a susceptor inside, instead of the heating source 40. In that case, the susceptor may be inductively heated by means of an induction coil disposed in the flavor inhaler 120. Alternatively, the flavor inhaler 120 may have a microwave radiation source instead of the heating source 40. In that case, a microwave absorber such as water or glycerol contained in the flavor-generating article 110 may be heated by means of microwaves from the microwave radiation source. Configurations such as these allow the flavor-generating article 110 to be heated without the need to insert a pin-type or other heater into the flavor-generating article 110, and it is possible to inhibit adhesion of parts of the flavor-generating article 110 to such a heater, which would cause a drop in heating efficiency.

[0043] Fig. 2 is a drawing showing a smoking system 100 according to another embodiment. The configuration of the heating source 40 in the smoking system 100 shown in fig. 2 differs from that of the smoking system 100 shown in fig. 1. Specifically, the flavor inhaler 120 of the smoking system shown in fig. 2 comprises a pin- or blade-type heating source 40 which is inserted into the flavor-generating article 110. That is, the flavor inhaler 120 shown in fig. 2 is a flavor inhaler of what is known as the internal heating type.

[0044] The smoking systems 100 shown in fig. 1 and 2 have what is known as a counterflow air flow path, but this is not limiting, and they may equally have what is known as a bottom-flow air flow path, where air is

supplied to the interior of the heating unit 30 and to the flavor-generating article 110 from a bottom portion of the heating unit 30.

[0045] Fig. 3 is an exploded oblique view of the flavor-generating article 110. Furthermore, fig. 4 is a schematic view in cross section of the flavor-generating article 110. Specifically, fig. 4(a) is a schematic view in side section of the flavor-generating article 110. Fig. 4(b) is a view in cross section seen along the arrows b-b in fig. 4(a). As shown in fig. 3 and 4(a), the flavor-generating article 110 comprises: a flavor-generating portion 220 for generating a flavor; and a hollow tube portion 132 disposed on a downstream side of the flavor source 220. More specifically, in the example depicted, the flavor-generating article 110 comprises, in order from the tip-end side (i.e., the opposite side to a mouthpiece): the tip-end plug 112; a flavor-generating portion 220; a hollow tube portion 132; a hollow filter portion 240; and a filter plug 250. These five components are joined by using an outer plug wrap 280 (corresponding to an example of a second wrapper), an outer plug wrap 260, and a tipping paper 270 (corresponding to an example of a first wrapper).

[0046] There is no particular restriction on the inhalation resistance in the long axis direction per flavor-generating article 110, but, from the viewpoint of ease of drawing, it is normally 8 mmH₂O or greater, preferably 10 mmH₂O or greater, and more preferably 12 mmH₂O or greater, and is also normally 150 mmH₂O or less, preferably 100 mmH₂O or less, more preferably 80 mmH₂O or less, and still more preferably 60 mmH₂O or less. As a specific example, the inhalation resistance of the flavor-generating article 110 is preferably 30 mmH₂O-150 mmH₂O. In this case the user can be provided with comfortable drawing resistance. The inhalation resistance is measured by using a filter inhalation resistance measurement instrument manufactured by Cerulean, for example, in accordance with the ISO standard method (ISO6565:2015). The inhalation resistance denotes an air pressure difference between one end face (a first end face) and another end face (a second end face) when air at a predetermined air flow rate (17.5 ml/sec) flows from the first end face to the second end face in a state in which air does not pass through the side face of the flavor-generating article 110. The units are generally expressed in mmH₂O. The relationship between inhalation resistance and length of a heat-not-burn cigarette is known to be a proportional relationship in a normal length range (a length of 5 mm-200 mm), and the inhalation resistance of the heat-not-burn cigarette doubles when the length doubles.

[0047] The rod-shaped flavor-generating article 110 preferably has a columnar shape satisfying a shape in which the aspect ratio as defined below is 1 or greater.

Aspect ratio = h/w

w is the width of a bottom face of a columnar body (in the present specification, this is the width of the bottom face on the flavor-generating portion 220 side), h is the height, and preferably $h \geq w$. In the present specification, the long axis direction is the direction represented by h . Thus, for the sake of convenience, the direction represented by h is still referred to as the long axis direction even when $w \geq h$. There is no limitation as to the shape of the bottom face, and it may be polygonal, rounded-corner polygonal, circular, or elliptical, etc. The width w is the diameter when the bottom face is circular, the major diameter when the bottom face is elliptical, and the diameter of a circumscribed circle or the major diameter of a circumscribed ellipse when the bottom face is polygonal or rounded-corner polygonal.

[0048] There is no particular restriction on the length h of the flavor-generating article 110 in the long axis direction, and it is normally 40 mm or greater, preferably 45 mm or greater, and more preferably 50 mm or greater, for example. Furthermore, the length h is normally 100 mm or less, preferably 90 mm or less, and more preferably 80 mm or less.

[0049] There is no particular restriction on the width w of the bottom face of the columnar body constituting the flavor-generating article 110, and it is normally 5 mm or greater, and preferably 5.5 mm or greater, for example. Furthermore, the width w is normally 10 mm or less, preferably 9 mm or less, and more preferably 8 mm or less.

[0050] There is no particular restriction on a ratio (hollow tube portion 132 : filter segment) between the lengths of the hollow tube portion 132 and the filter segment (total length of the hollow filter portion 240 and the filter plug 250), in the length of the flavor-generating article 110, but from the viewpoint of the amount of flavoring delivered and the appropriate aerosol temperature, this ratio is normally 0.60-1.40:0.60-1.40, preferably 0.80-1.20:0.80-1.20, more preferably 0.85-1.15:0.85-1.15, even more preferably 0.90-1.10:0.90-1.10, and particularly preferably 0.95-1.05:0.95-1.05. By setting the ratio of the lengths of the hollow tube portion 132 and the filter segment (hollow filter portion 240 and filter plug 250) within the above ranges, a balance is achieved between the cooling effect, the effect of suppressing losses due to adhesion of the generated vapor and aerosol to the inner wall of the hollow tube portion 132, and the function of the filter in adjusting the volume of air and the flavor, thereby making it possible to achieve the effect of providing a pleasing and intense flavor. In particular, a longer hollow tube portion 132 can promote aerosol particle formation, etc. and produce a good flavor, but if it is too long, substances passing through will end up adhering to the inner wall.

[0051] The flavor-generating portion 220 is disposed adjacently downstream of the tip-end plug 112. The flavor-generating portion 220 comprises: the flavor source 221; and a wrapping paper 222 wrapped around the flavor source 221. There is no particular restriction on the form of the flavor-generating portion 220 provided that it has a well-known form, and it is normally in a form in which the flavor source 221 is wrapped with the wrapping paper 222. The flavor-generating portion 220 is formed by wrapping the flavor source 221 with the wrapping paper 222 so that the flavor source 221 is on the inside. The wrapping paper 222 may be omitted from the flavor-generating portion 220 provided that there are no manufacturing problems. The flavor source 221 may contain a tobacco filling material. There is no particular restriction on the tobacco filling material, and it is possible to use a first tobacco filling material or a second tobacco filling material which will be described later. Furthermore, in the specification of this application, dried tobacco molded articles such as cut tobacco, tobacco sheets or tobacco grains may be referred to simply as "dried tobacco leaf". Furthermore, the flavor-generating portion 220 may comprise a mating portion which mates with the heating source 40 for heating the tobacco product.

[0052] The flavor-generating portion 220 formed by wrapping the flavor source 221 with the wrapping paper 222 preferably has a columnar shape, in which case the aspect ratio, which is expressed by the height in the long axis direction of the flavor-generating portion 220 to the width of the bottom face of the flavor-generating portion 220, is preferably 1 or greater. There is no limitation as to the shape of the bottom face, and it may be polygonal, rounded-corner polygonal, circular, or elliptical, etc. The width of the bottom face is the diameter when the bottom face is circular, the major diameter when the bottom face is elliptical, and the diameter of a circumscribed circle or the major diameter of a circumscribed ellipse when the bottom face is polygonal or rounded-corner polygonal.

[0053] The length of the flavor-generating portion 220 in the long axis direction may be appropriately varied according to the size of the product, but it is normally 10 mm or greater and preferably 12 mm or greater, and is normally 70 mm or less, preferably 50 mm or less, more preferably 30 mm or less, even more preferably 25 mm or less, and still more preferably 20 mm or less.

[0054] Furthermore, there is no particular restriction on the ratio of the length of the flavor-generating portion 220 to the overall length of the flavor-generating article 110 in the long axis direction, but, from the point of view of a balance between delivery amount and aerosol temperature, this ratio is normally 10% or greater and preferably 20% or greater, and is normally 80% or less, preferably 70% or less, more preferably 60% or less, even more preferably 50% or less, particularly preferably 45% or less, and most preferably 40% or less.

[0055] There is no particular restriction on the content of dried tobacco leaf in the flavor-generating portion 220, but between 150 mg/rod portion and 800 mg/rod portion may be cited, and between 200 mg/rod portion and 600 mg/rod portion is preferred.

[0056] The description will start from the first tobacco filling material (also referred to simply as the "first filling material"). There is no particular limitation as to the material of the cut tobacco contained in the first filling material, and it is possible to use a well-known material such as lamina or midrib. Furthermore, in order to produce cut tobacco, ground tobacco may be formed by grinding dried tobacco leaves to an average particle size of 20 μm -200 μm , then the material may be homogenized and processed into a sheet, and the homogenized sheet may be cut. In addition, the cut tobacco may be of what is known as the "strand-type", where the wrapping paper 222 is packed with a material obtained by cutting, in the longitudinal direction of the flavor-generating portion 220 and substantially horizontally, a homogenized sheet having a length similar to that of the flavor-generating portion 220 in the longitudinal direction. Furthermore, the width of the cut tobacco is preferably 0.5 mm-2.0 mm in order to fill the wrapping paper 222.

[0057] Various types of tobacco may be used for the tobacco leaves used in the production of the cut tobacco and the homogenized sheet. Examples that may be cited include flue-cured, Burley, Oriental, or native type, and other *Nicotiana tabacum* and *Nicotiana rustica* varieties, and mixtures thereof. A suitable blend of the abovementioned varieties may be used in a mixture to achieve the intended taste. Details on the abovementioned tobacco varieties are disclosed in "Encyclopedia of Tobacco, Tobacco Academic Studies Center, March 31, 2009". Several conventional methods are known for producing the homogenized sheet, that is, methods for grinding tobacco leaves and processing them into a homogenized sheet. According to a first method, a paper sheet is produced by using a papermaking process. According to a second method, a suitable solvent such as water is mixed with ground tobacco leaves and homogenized, after which the homogenized material is thinly cast on a metal plate or a metal plate belt and dried, to produce a cast sheet. According to a third method, a suitable solvent such as water is mixed with ground tobacco leaves and homogenized, and the homogenized material is extruded into the form of a sheet and shaped to produce a calendered sheet. Details on the abovementioned types of homogenized sheets are disclosed in "Encyclopedia of Tobacco, Tobacco Academic Studies Center, March 31, 2009".

[0058] The amount of moisture contained in the tobacco filling material is 10 wt%-15 wt%, and preferably 11 wt%-13 wt% with respect to the total weight of the tobacco sheet, for example. A moisture content such as this inhibits the formation of wrapping stains and improves rolling suitability during production of the flavor-

generating portion 220. There is no particular restriction on the size or method of preparation of the cut tobacco contained in the first tobacco filling material. For example, a material obtained by cutting dried tobacco leaves to a width of 0.5 mm-2.0 mm may be used for the first tobacco filling material. Furthermore, when ground material is used in the homogenized sheet, dried tobacco leaves may be ground to an average particle size of around 20 μm -200 μm , then homogenized and formed into a sheet which may then be cut to widths of 0.5 mm-2.0 mm for use as the first tobacco filling material.

[0059] The first tobacco filling material may comprise an aerosol base material for generating an aerosol. There is no particular limitation as to the type of aerosol base material, and various types of natural extracts and/or components thereof may be selected, according to the application. Aerosol base materials that may be cited include glycerol, propylene glycol, triacetin, 1,3-butanediol, and mixtures thereof.

[0060] There is no particular limitation as to the amount of the aerosol base material contained in the first tobacco filling material, and the amount is normally 5 wt% or greater and preferably 10 wt% or greater, and normally 50 wt% or less, and preferably 15 wt% or greater and 25 wt% or less, with respect to the total amount of tobacco filling material, from the viewpoint of sufficient aerosol generation and imparting a good flavor.

[0061] The first tobacco filling material may contain a flavoring. There is no particular limitation as to the type of flavoring, and, from the point of view of imparting a pleasant flavor, examples of flavorings that may be cited include: acetanisole, acetophenone, acetylpyrazine, 2-acetylthiazole, alfalfa extract, amyl alcohol, amyl butyrate, trans-anethole, star anise oil, apple juice, Peru Balsam oil, beeswax absolute, benzaldehyde, benzoin resinoid, benzyl alcohol, benzyl benzoate, benzyl phenylacetate, benzyl propionate, 2,3-butanedione, 2-butanol, butyl butyrate, butyric acid, caramel, cardamom oil, carob absolute, β -carotene, carrot juice, L-carvone, β -caryophyllene, cassia bark oil, cedar wood oil, celery seed oil, chamomile oil, cinnamaldehyde, cinnamic acid, cinnamyl alcohol, cinnamyl cinnamate, citronella oil, DL-citronellol, clary sage extract, cocoa, coffee, cognac oil, coriander oil, cuminaldehyde, davana oil, δ -decalactone, γ -decalactone, decanoic acid, dill herb oil, 3,4-dimethyl-1,2-cyclopentanedione, 4,5-dimethyl-3-hydroxy-2,5-dihydrofuran-2-one, 3,7-dimethyl-6-octenoic acid, 2,3-dimethylpyrazine, 2,5-dimethylpyrazine, 2,6-dimethylpyrazine, 2-ethyl methylbutyrate, ethyl acetate, ethyl butyrate, ethyl hexanoate, ethyl isovalerate, ethyl lactate, ethyl laurate, ethyl levulinate, ethyl maltol, ethyl octanoate, ethyl oleate, ethyl palmitate, ethyl phenylacetate, ethyl propionate, ethyl stearate, ethyl valerate, ethyl vanillin, ethyl vanillin glucoside, 2-ethyl-3,(5 or 6)-dimethylpyrazine, 5-ethyl-3-hydroxy-4-methyl-2(5H)-furanone, 2-ethyl-3-methylpyrazine, eucalyptol, fenugreek absolute, genet absolute,

gentian root infusion, geraniol, geranyl acetate, grape juice, guaiacol, guava extract, γ -heptalactone, γ -hexalactone, hexanoic acid, cis-3-hexen-1-ol, hexyl acetate, hexyl alcohol, hexyl phenylacetate, honey, 4-hydroxy-3-pentenoic acid lactone, 4-hydroxy-4-(3-hydroxy-1-butenyl)-3,5,5-trimethyl-2-cyclohexen-1-one, 4-(para-hydroxyphenyl)-2-butanone, 4-hydroxyundecanoic acid sodium, immortelle absolute, β -ionone, isoamyl acetate, isoamyl butyrate, isoamyl phenylacetate, isobutyl acetate, isobutyl phenylacetate, jasmine absolute, kola nut tincture, labdanum oil, lemon terpeneless oil, glycyrrhiza extract, linalool, linalyl acetate, lovage root oil, maltol, maple syrup, menthol, menthone, acetic acid L-menthyl, paramethoxybenzaldehyde, methyl-2-pyrrolyl ketone, methyl anthranilate, methyl phenylacetate, methyl salicylate, 4'-methylacetophenone, methylcyclopentenolone, 3-methylvaleric acid, mimosa absolute, molasses, myristic acid, nerol, nerolidol, γ -nonalactone, nutmeg oil, δ -octalactone, octanal, octanoic acid, orange flower oil, orange oil, orris root oil, palmitic acid, ω -pentadecalactone, peppermint oil, petitgrain Paraguay oil, phenethyl alcohol, phenethyl phenylacetate, phenylacetic acid, piperonal, plum extract, propenyl guaethol, propyl acetate, 3-propylidene phthalide, prune juice, pyruvic acid, raisin extract, rose oil, rum, sage oil, sandalwood oil, spearmint oil, styrax absolute, marigold oil, tea distillate, α -terpineol, terpinyl acetate, 5,6,7,8-tetrahydroquinoxaline, 1,5,5,9-tetramethyl-13-oxacyclo(8.3.0.0(4.9))tridecane, 2,3,5,6-tetramethylpyrazine, thyme oil, tomato extract, 2-tridecanone, triethyl citrate, 4-(2,6,6-trimethyl-1-cyclohexenyl)-2-buten-4-one, 2,6,6-trimethyl-2-cyclohexen-1,4-dione, 4-(2,6,6-trimethyl-1,3-cyclohexadienyl)-2-buten-4-one, 2,3,5-trimethylpyrazine, γ -undecalactone, γ -valerolactone, vanilla extract, vanillin, veratraldehyde, violet leaf absolute, N-ethyl-p-menthane-3-carboamide (WS-3), and ethyl-2-(p-menthane-3-carboxamide) acetate (WS-5), with menthol being especially preferred. Furthermore, one type of these flavorings may be used alone, or two or more types may be used in combination.

[0062] There is no particular limitation as to the amount of flavoring contained in the first tobacco filling material, and, from the point of view of imparting a good flavor, the content is normally 10,000 ppm or greater, preferably 20,000 ppm or greater, and more preferably 25,000 ppm or greater, and is normally 70,000 ppm or less, preferably 50,000 ppm or less, more preferably 40,000 ppm or less, and even more preferably 33,000 ppm or less.

[0063] There is no particular limitation as to the packing density of the first tobacco filling material, and it is normally 250 mg/cm³ or greater and preferably 300 mg/cm³ or greater, and normally 400 mg/cm³ or less, and preferably 350 mg/cm³ or less, from the viewpoint of ensuring the performance of the flavor-generating article 110 and imparting a good flavor.

[0064] The second tobacco filling material is formed from a tobacco sheet which is packed in a filled object

(e.g., the wrapping paper 222). There may be one tobacco sheet, or two or more tobacco sheets. When the second tobacco filling material comprises one tobacco sheet, for example, there may be cited a form of filling in which a tobacco sheet having one side of comparable length with the longitudinal direction of the filled object is folded multiple times along creases substantially parallel to the longitudinal direction of the filled object (forming what is known as a "gathered sheet"). As the abovementioned form of filling, there may also be cited a form in which a tobacco sheet having one side of comparable length with the longitudinal direction of the filled object is wound around a longitudinal axis of the filled material.

[0065] When the second tobacco filling material comprises two or more tobacco sheets, for example, there may be cited a form of filling in which a plurality of tobacco sheets each having one side of comparable length with the longitudinal direction of the filled object are wound about a longitudinal axis of the filled object so that the plurality of tobacco sheets are concentrically arranged. "Concentrically arranged" means that the centers of all of the tobacco sheets are arranged at substantially the same position. Furthermore, there is no particular restriction on the number of tobacco sheets, and forms with two sheets, three sheets, four sheets, five sheets, six sheets or seven sheets may be cited. The two or more tobacco sheets may all have the same composition or physical properties, or some or all of the tobacco sheets may have different compositions or physical properties. Furthermore, the tobacco sheets may each have the same thickness or different thicknesses.

[0066] The second tobacco filling material may be produced by preparing multiple tobacco sheets with different widths, constructing a laminate which is stacked in such a way that the width decreases from the bottom portion toward the top portion, and winding and shaping this laminate by passing the laminate through a winding tube. By virtue of this production method, the plurality of tobacco sheets are concentrically arranged about the longitudinal axis while also extending in the longitudinal direction. Furthermore, a longitudinally-extending mating portion may be formed between the longitudinal axis and the tobacco sheet on the innermost layer.

[0067] In this production method, the laminate is preferably constructed so that non-contact portions are formed between adjacent tobacco sheets after the laminate has been wound and shaped. When non-contact portions (gaps) where there is no contact between tobacco sheets are present between the plurality of tobacco sheets, this makes it possible to maintain a flavor flow path to enhance the efficiency of delivering flavor components. Meanwhile, high heat transfer efficiency can be ensured because heat from the heater can be transferred to the outer tobacco sheets through the contacting parts of the plurality of tobacco sheets.

Examples that may be cited of methods for providing non-contacting portions, where the tobacco sheets are not in contact with each other, between the plurality of tobacco sheets include: a method of using embossed tobacco sheets; a method of laminating the tobacco sheets without bonding the entire surfaces of adjacent tobacco sheets; a method of laminating the tobacco sheets with partial bonding between adjacent tobacco sheets; or a method of constructing a laminate by laminating the tobacco sheets with light bonding between adjacent tobacco sheets over the entire surface or a portion thereof so that the tobacco sheets peel after the winding and shaping. When a flavor-generating portion 220 including the wrapping paper 222 is prepared, the wrapping paper 222 may be arranged on the bottommost portion of the laminate. Furthermore, it is also possible to form a mating portion by forming the second tobacco filling material with a cylindrical dummy such as a mandrel placed on the topmost portion of the laminate, and then removing this dummy.

[0068] There is no particular limitation as to the packing density of the second tobacco filling material, and it is normally 250 mg/cm³ or greater and preferably 300 mg/cm³ or greater, and normally 400 mg/cm³ or less, and preferably 350 mg/cm³ or less, from the viewpoint of ensuring the performance of the flavor-generating article 110 and imparting a good flavor.

[0069] The tobacco sheet may comprise an aerosol base material which generates an aerosol as it is heated. An aerosol source such as a polyol, including glycerol, propylene glycol or 1,3-butanediol is added as the aerosol base material. The amount of this aerosol base material which is added is preferably 5 wt%-50 wt%, and more preferably 15 wt%-25 wt%, with respect to the dry weight of the tobacco sheet.

[0070] The tobacco sheet may be appropriately produced by well-known methods such as sheet-forming, slurry or rolling. Moreover, the homogenized sheet described above in relation to the first tobacco filling material may also be used. In the case of sheet-forming, the tobacco sheet may be produced by a method comprising the following steps. 1) Dried tobacco leaf is coarsely ground, extracted with water and then separated into water extract and residue. 2) The water extract is dried under reduced pressure and concentrated. 3) Pulp is added to the residue, the materials are fiberized using a refiner and then formed into paper. 4) The concentrated water extract is added to a sheet formed from the paper and dried to form a tobacco sheet. In this case, a step for removing some of the components such as nitrosamines may also be added (see JP 2004-510422 A). In the case of a slurry process, the tobacco sheet may be produced by a method comprising the following steps. 1) Ground tobacco leaf is mixed with water, pulp, and a binder. 2) The mixture is thinly spread (cast) and dried. In this case, a step may be added where the slurry that has been obtained by mixing the ground tobacco leaf with water, pulp, and

a binder is exposed to ultraviolet or X-ray radiation to remove some components such as nitrosamine.

[0071] In addition to the above, a nonwoven fabric tobacco sheet produced by means of a method comprising the following steps may also be used, as disclosed in WO 2014/104078 A1. 1) Granular tobacco leaf and a binder are mixed. 2) The mixture is interposed between nonwoven fabrics. 3) The laminate is molded into a fixed shape by means of thermal fusion bonding, and a tobacco sheet in the form of a nonwoven fabric is obtained. The tobacco leaf starting material used in the methods above may be the same type as described above in relation to the first tobacco filling material.

[0072] There is no particular limitation as to the composition of the tobacco sheet, but, for example, the content of tobacco starting material (tobacco leaf) is preferably 50 wt%-95 wt% with respect to the total weight of the tobacco sheet. Furthermore, the tobacco sheet may comprise a binder, and examples of such binders which may be cited include: guar gum, xanthan gum, CMC (carboxymethylcellulose), and CMC-Na (carboxymethylcellulose sodium salt), etc. The amount of binder is preferably 1 wt%-10 wt% with respect to the total weight of the tobacco sheet. The tobacco sheet may further comprise other additives. Examples of other additives which may be cited include fillers such as pulp. Furthermore, when several tobacco sheets are used in this embodiment, these tobacco sheets may all have the same composition or physical properties, or some or all of the tobacco sheets may have different compositions or physical properties.

[0073] There is no restriction on the thickness of each tobacco sheet, and the thickness is preferably 150 μm -1000 μm , and more preferably 200 μm -600 μm , from the point of view of a balance between heat transfer and strength. The tobacco sheets may have the same thickness or different thicknesses.

[0074] The flavor-generating portion 220 may contain dried tobacco leaf (tobacco leaves which have been dried) and a flavoring-containing material incorporating the flavoring in a polysaccharide gel. The flavoring-containing material is a material incorporating the flavoring in a polysaccharide gel, and blending the flavoring-containing material into the flavor-generating portion 220 makes it possible to suppress variations in the amount of flavoring delivered with each puff, and to sustain a good flavor from the start of smoking until the later stages. The present inventors infer that the reasons for this are as follows. The flavor-generating article 110 is first of all inserted into the flavor inhaler 120 shown in fig. 1 and preheating is performed for a given time, after which smoking is started, but it is thought that if the flavoring is directly blended into the flavor-generating portion 220, the flavoring is volatilized during the preheating, with the majority thereof being delivered during the initial period of smoking, and the amount of flavoring delivered in the later stages of smoking is therefore

insufficient. In contrast to this, when the flavoring-containing material is blended into the flavor-generating portion 220, volatilization of the flavoring during preheating is inhibited because the flavoring is coated with the polysaccharide gel, and the flavoring is gradually released during smoking. It is therefore inferred that a sufficient delivery amount of the flavoring can also be maintained in the later stages of smoking.

[0075] Components of the flavoring-containing material are described below. There is no particular limitation as to the type of flavoring, and, from the point of view of imparting a favorable taste, examples of flavorings that may be cited include: acetanisole, acetophenone, acetylpyrazine, 2-acetylthiazole, alfalfa extract, amyl alcohol, amyl butyrate, trans-anethole, star anise oil, apple juice, Peru Balsam oil, beeswax absolute, benzaldehyde, benzoin resinoid, benzyl alcohol, benzyl benzoate, benzyl phenylacetate, benzyl propionate, 2,3-butanedione, 2-butanol, butyl butyrate, butyric acid, caramel, cardamom oil, carob absolute, β -carotene, carrot juice, L-carvone, β -caryophyllene, cassia bark oil, cedar wood oil, celery seed oil, chamomile oil, cinnamaldehyde, cinnamic acid, cinnamyl alcohol, cinnamyl cinnamate, citronella oil, DL-citronellol, clary sage extract, cocoa, coffee, cognac oil, coriander oil, cuminaldehyde, davana oil, δ -decalactone, γ -decalactone, decanoic acid, dill herb oil, 3,4-dimethyl-1,2-cyclopentanedione, 4,5-dimethyl-3-hydroxy-2,5-dihydrofuran-2-one, 3,7-dimethyl-6-octenoic acid, 2,3-dimethylpyrazine, 2,5-dimethylpyrazine, 2,6-dimethylpyrazine, 2-ethyl methylbutyrate, ethyl acetate, ethyl butyrate, ethyl hexanoate, ethyl isovalerate, ethyl lactate, ethyl laurate, ethyl levulinate, ethyl maltol, ethyl octanoate, ethyl oleate, ethyl palmitate, ethyl phenylacetate, ethyl propionate, ethyl stearate, ethyl valerate, ethyl vanillin, ethyl vanillin glucoside, 2-ethyl-3,(5 or 6)-dimethylpyrazine, 5-ethyl-3-hydroxy-4-methyl-2(5H)-furanone, 2-ethyl-3-methylpyrazine, eucalyptol, fenugreek absolute, genet absolute, gentian root infusion, geraniol, geranyl acetate, grape juice, guaiacol, guava extract, γ -heptalactone, γ -hexalactone, hexanoic acid, cis-3-hexen-1-ol, hexyl acetate, hexyl alcohol, hexyl phenylacetate, honey, 4-hydroxy-3-pentenoic acid lactone, 4-hydroxy-4-(3-hydroxy-1-butenyl)-3,5,5-trimethyl-2-cyclohexen-1-one, 4-(para-hydroxyphenyl)-2-butanone, 4-hydroxyundecanoic acid sodium, immortelle absolute, β -ionone, isoamyl acetate, isoamyl butyrate, isoamyl phenylacetate, isobutyl acetate, isobutyl phenylacetate, jasmine absolute, kola nut tincture, labdanum oil, lemon terpeneless oil, glycyrrhiza extract, linalool, linalyl acetate, lovage root oil, maltol, maple syrup, menthol, menthone, acetic acid L-menthyl, paramethoxybenzaldehyde, methyl-2-pyrrolyl ketone, methyl anthranilate, methyl phenylacetate, methyl salicylate, 4'-methylacetophenone, methylcyclopentenolone, 3-methylvaleric acid, mimosa absolute, molasses, myristic acid, nerol, nerolidol, γ -nonalactone, nutmeg oil, δ -octalactone, octanal, octanoic acid, orange flower oil, orange oil, orris

root oil, palmitic acid, ω -pentadecalactone, peppermint oil, petitgrain Paraguay oil, phenethyl alcohol, phenethyl phenylacetate, phenylacetic acid, piperonal, plum extract, propenyl guaethol, propyl acetate, 3-propylidene phthalide, prune juice, pyruvic acid, raisin extract, rose oil, rum, sage oil, sandalwood oil, spearmint oil, styrax absolute, marigold oil, tea distillate, α -terpineol, terpinyl acetate, 5,6,7,8-tetrahydroquinoxaline, 1,5,5,9-tetramethyl-13-oxacyclo(8.3.0.0(4.9))tridecane, 2,3,5,6-tetramethylpyrazine, thyme oil, tomato extract, 2-tridecanone, triethyl citrate, 4-(2,6,6-trimethyl-1-cyclohexenyl)-2-buten-4-one, 2,6,6-trimethyl-2-cyclohexen-1,4-dione, 4-(2,6,6-trimethyl-1,3-cyclohexadienyl)-2-buten-4-one, 2,3,5-trimethylpyrazine, γ -undecalactone, γ -valerolactone, vanilla extract, vanillin, veratraldehyde, violet leaf absolute, N-ethyl-p-menthane-3-carboamide (WS-3), and ethyl-2-(p-menthane-3-carboxamide) acetate (WS-5), with menthol being especially preferred. Furthermore, one type of these flavorings may be used alone, or two or more types may be used in combination.

[0076] The amount of flavoring contained in the flavoring-containing material is normally 18 mass% or greater, preferably 50 mass% or greater, and more preferably 60 mass% or greater, and is normally 90 mass% or less, and preferably 80 mass% or less, although this also depends on the type of flavoring and the type of polysaccharide, etc.

[0077] There is no particular limitation as to the type of polysaccharide, but it is preferably a single-component system comprising carrageenan, agar, gellan gum, tamarind gum, psyllium seed gum, or konjac glucomannan; or is preferably a composite system comprising a combination of two or more components selected from the group consisting of carrageenan, locust bean gum, guar gum, agar, gellan gum, tamarind gum, xanthan gum, tara gum, konjac glucomannan, starch, cassia gum, and psyllium seed gum. These polysaccharides form a gel simply by heating at 30°C-90°C in an aqueous solution so there is no need for a gelling agent such as a metal chloride when the flavoring-containing material is prepared, which is desirable because it means that no undesirable components such as chloride decomposition products are produced in mainstream smoke during smoking.

[0078] An emulsifier which is used to emulsify the starting material during preparation of the flavoring-containing material may also be included. There is no particular limitation as to the type of emulsifier, and examples that may be cited include lecithin, glycerol fatty acid ester, polyglycerol fatty acid ester, sorbitan fatty acid ester, polyoxyethylene sorbitan fatty acid ester, propylene glycol fatty acid ester, and sucrose fatty acid ester, etc., with lecithin being preferred. Moreover, one type of these emulsifiers may be used alone, or two or more types may be used in combination.

[0079] There is no particular limitation as to the method of preparing the flavoring-containing material, and it

may be prepared in accordance with a well-known method. Well-known methods that may be cited include the methods disclosed in WO 2011/118040 A1, JP 2013-099349 A, and WO 2012/118034 A1, etc. More specifically, the flavoring-containing material may be prepared by means of a method comprising the following steps (i) and (ii), for example:

(i) a step in which a polysaccharide and water mixture is heated, normally at 30°C-90°C, preferably at 60°C-90°C, to prepare a polysaccharide aqueous solution; and

(ii) a step in which a flavoring is kneaded with the aqueous solution, with the addition of an emulsifier as required, in order to obtain an emulsion slurry.

[0080] The amount of flavoring-containing material contained in the flavor-generating portion 220 also depends on the amount of flavoring contained in the flavoring-containing material, but the content is normally 1 mass% or greater and preferably 5 mass% or greater, and normally 20 mass% or less, and preferably 10 mass% or less, with respect to the dried tobacco leaf. Furthermore, the flavor-generating portion 220 comprises the flavoring-containing material such that the content of flavoring contained in the flavoring-containing material is normally 1 mg or greater, preferably 5 mg or greater, and more preferably 10 mg or greater, and normally 30 mg or less, and preferably 20 mg or less. By setting the amount of flavoring-containing material contained in the flavor-generating portion 220 within this range, it is not only possible to impart a favorable taste, it is also possible to suppress variations in the amount of flavoring delivered with each puff from the start of smoking until the later stages, and furthermore to ensure a sufficient delivery amount throughout all stages of smoking, including the start, middle and end.

[0081] There is no particular limitation as to the form of blending the flavoring-containing material with the flavor-generating portion 220, and the flavoring-containing material may be arranged inside and/or outside the wrapping paper 222 wrapped around the flavor source 221, the wrapping paper 222 may be impregnated with the flavoring-containing material, or the flavoring-containing material may be blended into the flavor source 221. When the flavoring-containing material is arranged inside and/or outside the wrapping paper 222 wrapped around the flavor source 221, the wrapping paper 222 may be coated with the emulsion slurry, or the emulsion slurry may be successively cast onto a base material and dried to form a flavoring-containing sheet which is then wrapped around the flavor source 221 together with the wrapping paper. The wrapping paper 222 impregnated with the flavoring-containing material may be produced by impregnating the wrapping paper 222 with the emulsion slurry and then drying the materials. Furthermore, when the flavoring-contain-

ing material is blended into the flavor source 221, the dried tobacco leaf may be coated or impregnated with the emulsion slurry, or the abovementioned flavoring-containing sheet or cut material or ground material therefrom may be mixed with dried tobacco.

[0082] The flavor source 221 may be block-shaped, or may be cylindrical, for example. When the flavor source 221 is cylindrical, a void extending in the direction of adjacency of the flavor source 221 and the tip-end plug 112 may be formed on the inside of the flavor source 221. In this case, the flavor source 221 is positioned on the outside of the flavor-generating article 110, and the void is positioned on the inside of the flavor source 221, so when the flavor-generating article 110 is heated from the outside in the flavor inhaler 120, the flavor source 221 can be efficiently heated. Furthermore, when a flavor inhaler 120 which heats the flavor-generating article 110 from the outside is used, the flavor source 221 is not disposed on the inside of the flavor-generating article 110, which would be a position that is not conducive to heat transmission or conducive to contributing to vapor or aerosol generation, so it is possible to save on the amount of flavor source 221 while inhibiting a reduction in the amount of vapor or aerosol. The cylindrical flavor source 221 may be formed into a cylindrical shape by rounding a sheet-shaped flavor source 221, for example.

[0083] There is no particular restriction on the configuration of the wrapping paper 222 used in the flavor-generating article 110, and it may take a general form. Specifically, the wrapping paper may comprise pulp as its main component, for example. Pulps which may be used include wood pulps such as softwood pulp and hardwood pulp, flax pulp, hemp pulp, sisal pulp, and esparto, etc., and it is possible to use a pulp which is generally used in a wrapping paper for a tobacco product, and the wrapping paper may be obtained by a papermaking process employing one or more of these pulps. These pulps may be used alone, or several types of pulps may be combined in any proportions for use. Forms of pulp which may be used include chemical pulp, ground pulp, chemiground pulp, and thermo-mechanical pulp, etc. which are obtained by means of kraft digestion, acid/neutral/alkaline sulfite digestion, and soda digestion, etc.

[0084] The wrapping paper may be produced by using the abovementioned pulp in a paper making process employing a Fourdrinier machine, a cylinder paper machine, or a round-short combination paper machine, etc., then adjusting the texture and homogenizing the resulting paper. It should be noted that, if necessary, a wet strength agent can be added to impart water resistance to the wrapping paper, or a sizing agent can be added to adjust a printing condition of the wrapping paper. A papermaking internal sizing agent and a paper manufacturing additive may further be added to the wrapping paper. Papermaking internal sizing agents may include, for example, aluminum sulfate, various

types of anionic, ionic, nonionic or amphoteric yield improving agents, water filtration improving agents, and paper strength agents, etc. Paper manufacturing additives may include, for example, dyes, pH regulators, defoaming agents, pitch control agents, and slime control agents, etc.

[0085] The basis weight of the base paper of the wrapping paper is normally 30 gsm or greater, and preferably 35 gsm or greater, for example. Meanwhile, the basis weight is normally 70 gsm or less, preferably 50 gsm or less, and even more preferably 45 gsm or less. There is no particular limitation as to the thickness of the wrapping paper having the characteristics above, but it is preferably 40 μm or greater, and is normally 100 μm or less, preferably 75 μm or less, and more preferably 60 μm or less, from the viewpoint of rigidity and air permeability, and ease of making adjustments during papermaking. Square or rectangular may be cited as shapes of the wrapping paper of the flavor-generating article 110. In the case of a wrapping paper 222 for wrapping the flavor source 221 (for producing the flavor-generating portion 220), the length of one side of the wrapping paper 222 may be around 12 mm-70 mm, and the length of the other side (the side connecting to said one side) may be 15 mm-28 mm, may preferably be 22 mm-24 mm, and may even more preferably be around 23 mm.

[0086] When the flavor source 221 is wrapped into a columnar shape by the wrapping paper 222, an end portion of the wrapping paper 222 in the width direction may be glued to an end portion on the opposite side with an overlap of around 2 mm, for example. As a result, the wrapping paper 222 has the shape of a columnar paper tube internally filled with the flavor source 221. The size of a rectangular wrapping paper 222 may be determined by the size of the flavor-generating portion 220. In the case of a wrapping paper for joining and wrapping the flavor-generating portion 220 and another member adjacent to the flavor-generating portion 220, the length of one side may be 20 mm-60 mm, and the length of the other side (the side connecting to said one side) may be 15 mm-28 mm.

[0087] In addition to the abovementioned pulp, the wrapping paper may also comprise a loading material. The content of the loading material may be 10 wt% or greater and less than 60 wt%, and is preferably 15 wt%-45 wt%, with respect to the total weight of the wrapping paper. The content of the loading material is preferably 15 wt%-45 wt% when the basis weight of the wrapping paper is in the preferred range (35 gsm-50 gsm). In addition, the content of the loading material is preferably 25 wt%-45 wt% when the basis weight of the wrapping paper is greater than 35 gsm and no greater than 50 gsm. Calcium carbonate, titanium dioxide, or kaolin, etc. may be used as the loading material, but calcium carbonate is preferably used from the point of view of improving flavor and whiteness, etc.

[0088] Various auxiliaries other than the base paper

and the loading material may also be added to the wrapping paper. A water-resistance improving agent may be added to the wrapping paper in order to improve water resistance, for example. Water-resistance improving agents may include wet-strength agents (WS agents) and sizing agents. The wet strength agent may comprise, for example, a urea formaldehyde resin, a melamine formaldehyde resin, and polyamide epichlorohydrin (PAE), etc. Furthermore, the sizing agent may comprise, for example, rosin soap, alkyl ketene dimer (AKD), alkenyl succinic anhydride (ASA), and high saponification polyvinyl alcohol having a degree of saponification of 90% or greater, etc. A paper strength agent may be added to the wrapping paper as an auxiliary. The paper strength agent may comprise, for example, polyacrylamide, cationic starch, oxidized starch, CMC, polyamide epichlorohydrin resin, and polyvinyl alcohol, etc. Using a minute amount of oxidized starch in particular as an auxiliary in the wrapping paper is known to improve air permeability (e.g., see JP 2017-218699 A).

[0089] A coating agent may be added to at least one of the front surface and the rear surface of the wrapping paper. There is no particular restriction on the coating agent, but a coating agent that can form a film on the surface of the paper and reduce liquid permeability is preferred. Examples of coating agents that may be cited include polysaccharides such as alginic acid and salts thereof (e.g., sodium salt), and pectin; cellulose derivatives such as ethyl cellulose, methyl cellulose, carboxymethyl cellulose, and nitrocellulose; and starch and derivatives thereof (e.g., ether derivatives such as carboxymethyl starch, hydroxyalkyl starch, and cationic starch, and ester derivatives such as acetate starch, phosphate starch, and octenyl succinate starch).

[0090] As shown in fig. 3 and 4(a), the flavor-generating article 110 may comprise the tip-end plug 112 (corresponding to an example of an upstream portion) disposed on the upstream side of the flavor-generating portion 220. As a result, an end portion of the flavor-generating portion 220 is covered by the tip-end plug 112, which therefore makes it possible to prevent the flavor-generating portion 220 from falling out from the flavor-generating article 110. Furthermore, the vapor or aerosol generated by the flavor-generating portion 220 can be inhibited from leaking to the upstream side of the flavor-generating portion 220. The tip-end plug 112 is positioned at the tip end of the flavor-generating article 110 and is configured to cover the end portion of the flavor source 221. Specifically, the tip-end plug 112 comprises a first filtration material 211, and a first inner plug wrap 212 wrapped around the first filtration material 211. The tip-end plug 112 may further include an aerosol source supported by the first filtration material 211.

[0091] The first filtration material 211 may employ a material which is generally usable as a filtration material in a flavor-generating article. Specifically, the first filtration material 211 may be, for example: paper, plas-

tic film, cellulose acetate, or nonwoven fabric, etc. The first filtration material 211 is preferably paper. The length of the tip-end plug 112 in the long axis direction may be 1 mm or greater, and is preferably 3 mm or greater and more preferably 5 mm or greater, and may be 10 mm or less, and preferably 8 mm or less. The tip-end plug 112 may be produced to a predetermined length, and may then be produced by being cut to any length. If the tip-end plug 112 has a length of less than 1 mm, then there is a risk of deformation such as crushing occurring, for example, because the shape cannot be maintained during cutting. The tip-end plug 112 can be produced relatively easily when the length of the tip-end plug 112 is 1 mm or greater in the longitudinal direction. More specifically, the length of the tip-end plug 112 in the longitudinal direction is preferably 5 mm-10 mm. If this length is less than 5 mm, there is a risk that it will not be possible to sufficiently inhibit leakage of the vapor or aerosol generated by the flavor-generating article 110 to the upstream side of the flavor-generating portion 220. There is also a risk here of the tip-end plug 112 falling out from the flavor-generating article 110 because it is too short. If the length above exceeds 10 mm, then there is a risk of the flavor-generating article 110 having excessively high air-flow resistance. By adopting the range above for the length of the tip-end plug 112, it is therefore possible to sufficiently inhibit leakage of the vapor or aerosol to the upstream side of the flavor-generating portion 220, while also inhibiting the airflow resistance of the flavor-generating article 110 from becoming excessively high and inhibiting the tip-end plug 112 from falling out from the flavor-generating article 110.

[0092] There is no particular restriction on the material of the first inner plug wrap 212 and a well-known material may be used. The first inner plug wrap 212 may contain a filler such as calcium carbonate, or the like. There is no particular restriction on the thickness of the first inner plug wrap 212, and it is normally 20 μm -140 μm , preferably 30 μm -130 μm , and more preferably 30 μm -120 μm . There is no particular restriction on the basis weight of the first inner plug wrap 212, but it is normally 20 gsm-100 gsm, preferably 22 gsm-95 gsm, and more preferably 23 gsm-90 gsm. Furthermore, the first inner plug wrap 212 may be coated or uncoated, but is preferably coated with a desired material from the viewpoint of allowing functions other than strength and structural rigidity to be imparted.

[0093] As shown in fig. 3, the flavor-generating article 110 preferably has a downstream portion 130 disposed on the downstream side of the flavor source 221. In this case, the vapor or aerosol generated by the flavor source 221 can be cooled and filtered in the downstream portion 130. Specifically, the flavor-generating article 110 preferably comprises a filter plug 250 disposed on the downstream side of the hollow tube portion 132. This enables the vapor or aerosol generated by the flavor-generating portion 220 to be cooled and

filtered in the filter plug 250.

[0094] The filter plug 250 is positioned in the end portion, on the mouthpiece side, of the flavor-generating article 110. The filter plug 250 comprises: a second filtration material 251, and a second inner plug wrap 252 wrapped around the second filtration material 251. There is no particular restriction as to the filter material used in the second filtration material 251, provided that it has the general functions of a filter. Examples of general functions of the filter which may be cited include adjusting the amount of air which is mixed when the aerosol, etc. is drawn in, lightening the flavor, and lightening nicotine and tar, etc., but the filter material used in the second filtration material 251 need not have all of these functions. Furthermore, in an electrically heated tobacco product, which generates fewer components and tends to have a lower filling ratio of tobacco filling material than a cigarette product, an important function of the filter also lies in preventing the tobacco filling material from falling out, while controlling a filtration function.

[0095] The filter plug 250 has a substantially circular shape in a cross section orthogonal to the longitudinal direction. The diameter of the circle may be suitably varied according to the size of the product, but it is normally 4.0 mm-9.0 mm, preferably 4.5 mm-8.5 mm, and more preferably 5.0 mm-8.0 mm. It should be noted that when the filter plug 250 does not have the abovementioned circular cross section, the diameter which is applied is the diameter of a circle having the same area as the area of the cross section thereof.

[0096] The circumferential length of the filter plug 250 in a cross section orthogonal to the longitudinal direction may be appropriately varied according to the size of the product, but it is normally 14.0 mm-27.0 mm, preferably 15.0 mm-26.0 mm, and more preferably 16.0 mm-25.0 mm.

[0097] The length of the filter plug 250 in the longitudinal direction may be appropriately varied according to the size of the product, but is normally 15 mm-35 mm, preferably 17.5 mm-32.5 mm, and more preferably 20.0 mm-30.0 mm. The shape and dimensions of the filter material used in the second filtration material 251 may be suitably adjusted so that the shape and dimensions of the filter plug 250 are in the ranges above.

[0098] There is no particular restriction on the inhalation resistance per 120 mm length of the filter plug 250 in the longitudinal direction, but it is normally 40 mmH₂O-300 mmH₂O, preferably 70 mmH₂O-280 mmH₂O, and more preferably 90 mmH₂O-260 mmH₂O. The inhalation resistance is measured by using a filter inhalation resistance measurement instrument manufactured by Cerulean, for example, in accordance with the ISO standard method (ISO6565). The inhalation resistance of the filter plug denotes an air pressure difference between one end face (a first end face) and another end face (a second end face) when air at a predetermined air flow rate (17.5 ml/sec) flows from

the first end face to the second end face in a state in which air does not pass through the side face of the filter plug. The units are generally expressed in mmH₂O. The relationship between inhalation resistance of the filter plug and length of the filter plug is known to be a proportional relationship in a normal length range (a length of 5-200 mm), and the inhalation resistance of the filter plug 250 doubles when the length doubles.

[0099] A material produced by means of a production method to be described below, for example, may be used for the filter material constituting the second filtration material 251 of the filter plug 250, and it is also possible to use a commercially available product. Furthermore, there is no particular restriction on the form of the filter plug 250, and it is possible to form a plain filter comprising a single filter segment, or a multi-segment filter comprising multiple filter segments, such as a dual filter or a triple filter, or the like.

[0100] The filter plug 250 may be produced by a well-known method, and when synthetic fibers such as a cellulose acetate tow are used as the material of the second filtration material 251, for example, the filter plug 250 may be produced by means of a method in which a polymer solution comprising a polymer and a solvent are spun and then crimped. For this method, it is possible to use the method disclosed in WO 2013/067511 A1, for example. The inhalation resistance and additives which are added to the second filtration material 251 (well-known adsorbents and flavorings (e.g., menthol), granular activated charcoal, and flavoring retention agents, etc.) may be appropriately designed in the production of the filter plug 250.

[0101] There is no particular restriction on the form of the second filtration material 251 constituting the filter plug 250, and a well-known form may be adopted. For example, a component obtained by processing cellulose acetate tow into a cylindrical shape may be used as the second filtration material 251. There is no particular limitation as to the single-yarn fineness and total fineness of the cellulose acetate tow, but in the case of a filter plug 250 having a circumference of 22 mm, the single-yarn fineness is preferably 5 g/9000 m-12 g/9000 m, and the total fineness is preferably 12,000 g/9000 m-35,000 g/9000 m. Cross-sectional shapes of the fibers of cellulose acetate tow that may be cited include circular, elliptical, Y-shaped, I-shaped, and R-shaped, etc. In the case of a filter filled with cellulose acetate tow, triacetin may be added in an amount of 5 wt%-10 wt% with respect to the weight of the cellulose acetate tow, in order to improve filter hardness. Furthermore, a paper filter filled with sheet-like paper pulp may also be used instead of the acetate filter.

[0102] There is no particular restriction on the density of the second filtration material 251, but it is normally 0.10 g/cm³-0.25 g/cm³, preferably 0.11 g/cm³-0.24 g/cm³, and more preferably 0.12 g/cm³-0.23 g/cm³.

[0103] The filter plug 250 may comprise a second

inner plug wrap 252 (wrap paper) wrapped around the second filtration material 251 (to be described later), from the point of view of improving strength and structural rigidity. There is no particular restriction on the form of the second inner plug wrap 252, and it may include a seam comprising one or more lines of adhesive. There is no particular limitation as to the adhesive, but it may comprise a vinyl acetate-based adhesive or a hot-melt adhesive, and the hot-melt adhesive may comprise polyvinyl alcohol. Furthermore, if the filter segment comprises two or more segments, the second inner plug wrap 252 is preferably wrapped around both of these two or more segments.

[0104] There is no particular restriction on the material of the second inner plug wrap 252, and a well-known material may be used, and it may furthermore include a filler such as calcium carbonate, etc. There is no particular restriction on the thickness of the second inner plug wrap 252, and it is normally 20 μm -140 μm , preferably 30 μm -130 μm , and more preferably 30 μm -120 μm . There is no particular restriction on the basis weight of the second inner plug wrap 252, but it is normally 20 gsm-100 gsm, preferably 22 gsm-95 gsm, and more preferably 23 gsm-90 gsm. Furthermore, the second inner plug wrap 252 may be coated or uncoated, but is preferably coated with a desired material from the viewpoint of allowing functions other than strength and structural rigidity to be imparted.

[0105] As shown in fig. 3 and 4(a), the hollow filter portion 240 and the filter plug 250 may be joined by the outer plug wrap 260 (outside wrap paper), for example. The outer plug wrap 260 may be a cylindrical paper, for example.

[0106] The second filtration material 251 may comprise a crushable additive release container (e.g., a capsule) comprising a crushable outer shell made of gelatin or the like. There is no particular restriction on the form of the capsule (also referred to as an "additive release container" in this technical field), and a well-known form may be adopted. For example, it is possible to adopt a crushable additive release container comprising a crushable outer shell made of gelatin or the like. In this case, when a capsule is ruptured before use, during use or after use by a tobacco product user, a liquid or a substance (normally a flavorant) contained inside the capsule is released, the liquid or substance is then transmitted to tobacco smoke while the tobacco product is being used, and is transmitted to the ambient environment after use.

[0107] There is no particular limitation as to the form of the capsule, and it may be an easily-breakable capsule, for example, and the shape thereof is preferably spherical. Any of the abovementioned additives may be contained as the additive included in the capsule, but a flavorant or activated carbon is especially preferably contained. Furthermore, one or more types of materials serving as an aid to filtering smoke may be added as an additive. There is no particular limitation as to the

form of the additive, and it is normally a liquid or a solid. It should be noted that use of a capsule containing an additive is well known in this technical field. Easily-breakable capsules and methods for producing same are well known in this technical field. Examples of flavorants include: menthol, spearmint, peppermint, fennugreek, or clove, and medium-chain fatty acid triglycerides (MCT), etc. The flavorant is menthol, or menthol, etc. may be used in combination.

[0108] A flavoring may be added to the second filtration material 251 in this embodiment. By adding a flavoring to the second filtration material 251, the amount of flavoring delivered during use is increased as compared to the prior art, where flavoring is added to the tobacco filling material constituting the tobacco rod. The degree of increase in the amount of flavoring delivered is further increased according to the position of perforations provided in the hollow tube portion 132 which will be described later. There is no particular restriction on the method of adding the flavoring to the second filtration material 251, and the flavoring should be added so as to be roughly uniformly dispersed in the second filtration material 251 which has the flavoring added thereto. As the amount of flavoring added to the second filtration material 251, there may be cited a form in which the flavoring is added to a 10-100 vol% portion of the second filtration material 251. The method of addition may comprise adding the flavoring in advance to the second filtration material 251, before the filter segment is constructed, or adding the flavoring after a filter cigarette has been constructed.

[0109] There is no particular limitation as to the type of flavoring, and, from the point of view of imparting a pleasant flavor, examples of flavorings that may be cited include: acetanisole, acetophenone, acetylpyrazine, 2-acetylthiazole, alfalfa extract, amyl alcohol, amyl butyrate, trans-anethole, star anise oil, apple juice, Peru Balsam oil, beeswax absolute, benzaldehyde, benzoin resinoid, benzyl alcohol, benzyl benzoate, benzyl phenylacetate, benzyl propionate, 2,3-butanedione, 2-butanol, butyl butyrate, butyric acid, caramel, cardamom oil, carob absolute, β -carotene, carrot juice, L-carvone, β -caryophyllene, cassia bark oil, cedar wood oil, celery seed oil, chamomile oil, cinnamaldehyde, cinnamic acid, cinnamyl alcohol, cinnamyl cinnamate, citronella oil, DL-citronellol, clary sage extract, cocoa, coffee, cognac oil, coriander oil, cuminaldehyde, davana oil, δ -decalactone, γ -decalactone, decanoic acid, dill herb oil, 3,4-dimethyl-1,2-cyclopentanedione, 4,5-dimethyl-3-hydroxy-2,5-dihydrofuran-2-one, 3,7-dimethyl-6-octenoic acid, 2,3-dimethylpyrazine, 2,5-dimethylpyrazine, 2,6-dimethylpyrazine, 2-ethyl methylbutyrate, ethyl acetate, ethyl butyrate, ethyl hexanoate, ethyl isovalerate, ethyl lactate, ethyl laurate, ethyl levulinate, ethyl maltol, ethyl octanoate, ethyl oleate, ethyl palmitate, ethyl phenylacetate, ethyl propionate, ethyl stearate, ethyl valerate, ethyl vanillin, ethyl vanillin glucoside, 2-ethyl-3,(5 or 6)-dimethylpyrazine, 5-ethyl-3-

hydroxy-4-methyl-2(5H)-furanone, 2-ethyl-3-methylpyrazine, eucalyptol, fenugreek absolute, genet absolute, gentian root infusion, geraniol, geranyl acetate, grape juice, guaiacol, guava extract, γ -heptalactone, γ -hexalactone, hexanoic acid, cis-3-hexen-1-ol, hexyl acetate, hexyl alcohol, hexyl phenylacetate, honey, 4-hydroxy-3-pentenoic acid lactone, 4-hydroxy-4-(3-hydroxy-1-butenyl)-3,5,5-trimethyl-2-cyclohexen-1-one, 4-(para-hydroxyphenyl)-2-butanone, 4-hydroxyundecanoic acid sodium, immortelle absolute, β -ionone, isoamyl acetate, isoamyl butyrate, isoamyl phenylacetate, isobutyl acetate, isobutyl phenylacetate, jasmine absolute, kola nut tincture, labdanum oil, lemon terpeneless oil, glycyrrhiza extract, linalool, linalyl acetate, lovage root oil, maltol, maple syrup, menthol, menthone, acetic acid L-menthyl, paramethoxybenzaldehyde, methyl-2-pyrrolyl ketone, methyl anthranilate, methyl phenylacetate, methyl salicylate, 4'-methylacetophenone, methylcyclopentenolone, 3-methylvaleric acid, mimosa absolute, molasses, myristic acid, nerol, nerolidol, γ -nonalactone, nutmeg oil, δ -octalactone, octanal, octanoic acid, orange flower oil, orange oil, orris root oil, palmitic acid, ω -pentadecalactone, peppermint oil, petitgrain Paraguay oil, phenethyl alcohol, phenethyl phenylacetate, phenylacetic acid, piperonal, plum extract, propenyl guaethol, propyl acetate, 3-propylidene phthalide, prune juice, pyruvic acid, raisin extract, rose oil, rum, sage oil, sandalwood oil, spearmint oil, styrax absolute, marigold oil, tea distillate, α -terpineol, terpinyl acetate, 5,6,7,8-tetrahydroquinoxaline, 1,5,5,9-tetramethyl-13-oxacyclo(8.3.0.0(4.9))tridecane, 2,3,5,6-tetramethylpyrazine, thyme oil, tomato extract, 2-tridecanone, triethyl citrate, 4-(2,6,6-trimethyl-1-cyclohexenyl)-2-buten-4-one, 2,6,6-trimethyl-2-cyclohexen-1,4-dione, 4-(2,6,6-trimethyl-1,3-cyclohexadienyl)-2-buten-4-one, 2,3,5-trimethylpyrazine, γ -undecalactone, γ -valerolactone, vanilla extract, vanillin, veratraldehyde, violet leaf absolute, N-ethyl-p-menthane-3-carboxamide (WS-3), and ethyl-2-(p-menthane-3-carboxamide) acetate (WS-5), with menthol being especially preferred. Furthermore, one type of these flavorings may be used alone, or two or more types may be used in combination.

[0110] The filter plug 250 in this embodiment may comprise the second filtration material 251, and activated charcoal may be added to at least a portion of the second filtration material 251. The amount of activated charcoal which is added may be $15.0 \text{ m}^2/\text{cm}^2$ - $80.0 \text{ m}^2/\text{cm}^2$, as a value which is specific surface area of activated charcoal $\times$ weight of activated charcoal / cross-sectional area of second filtration material 251 in a direction perpendicular to air flow direction, in one flavor-generating article 110. For convenience, the abovementioned "specific surface area of activated charcoal $\times$ weight of activated charcoal / cross-sectional area of second filtration material 251 in a direction perpendicular to air flow direction" may also be expressed as "surface area of activated charcoal per unit cross-sectional area". The surface area of acti-

vated charcoal per unit cross-sectional area may be calculated on the basis of the specific surface area of the activated charcoal added to the second filtration material 251 of one flavor-generating article 110, the weight of activated charcoal added, and the cross-sectional area of the second filtration material 251. It should be noted that the activated charcoal need not be uniformly dispersed in the filter material to which it is added, and it is not necessary for the range above to be satisfied over the entire cross section of the filter material (the cross section in a direction perpendicular to the air flow direction).

[0111] In this embodiment, as a result of the surface area of activated charcoal per unit cross-sectional area being within the range above, components generated by heating can be delivered in the desired amount to the user, and the user can also be provided with the desired sense of flavor. If the surface area of activated charcoal per unit cross-sectional area is smaller than the lower limit of the range above, then the effect of adding the activated charcoal cannot be sufficiently achieved. Meanwhile, if the surface area of activated charcoal per unit cross-sectional area is greater than the upper limit of the range above, then the components generated by heating decrease more than necessary. The surface area of activated charcoal per unit cross-sectional area is more preferably $17.0 \text{ m}^2/\text{cm}^2$ or greater, and even more preferably $35.0 \text{ m}^2/\text{cm}^2$ or greater. Meanwhile, the surface area of activated charcoal per unit cross-sectional area is more preferably $77.0 \text{ m}^2/\text{cm}^2$ or less, and even more preferably $73.0 \text{ m}^2/\text{cm}^2$ or less.

[0112] The surface area of activated charcoal per unit cross-sectional area may be adjusted, for example, by adjusting the specific surface area of the activated charcoal and the added amount thereof, and by adjusting the cross-sectional area of the second filtration material 251 in the direction perpendicular to air flow direction. The surface area of activated charcoal per unit cross-sectional area is calculated on the basis of the filter material to which the activated charcoal is added. When the filter plug 250 is formed from multiple filter materials, the calculation above is based on the cross-sectional area and length of only the filter material to which the activated charcoal is added.

[0113] Examples of activated charcoal which may be used in this embodiment that may be cited include those comprising wood, bamboo, coconut shell, walnut shell, and coal, etc. as a starting material. Furthermore, as the activated charcoal which may be used in this embodiment, activated charcoal having a BET specific area of $1100 \text{ m}^2/\text{g}$ - $1600 \text{ m}^2/\text{g}$ may be used, activated charcoal having a BET specific surface area of $1200 \text{ m}^2/\text{g}$ - $1500 \text{ m}^2/\text{g}$ may preferably be used, and activated charcoal having a BET specific surface area of $1250 \text{ m}^2/\text{g}$ - $1380 \text{ m}^2/\text{g}$ may more preferably be used. The BET specific surface area may be determined by the nitrogen gas adsorption method (BET multipoint meth-

od).

[0114] Furthermore, as the activated charcoal which may be used in this embodiment, activated charcoal having a pore volume of 400 $\mu\text{L/g}$ -800 $\mu\text{L/g}$ may be used, activated charcoal having a pore volume of 500 $\mu\text{L/g}$ -750 $\mu\text{L/g}$ may preferably be used, and activated charcoal having a pore volume of 600 $\mu\text{L/g}$ -700 $\mu\text{L/g}$ may more preferably be used. The pore volume may be calculated from a maximum adsorption amount obtained using the nitrogen gas adsorption method.

[0115] In this embodiment, the amount of activated charcoal which is added per unit length, in the air flow direction, of the second filtration material 251 to which the activated charcoal has been added, is preferably 5 mg/cm-50 mg/cm, more preferably 8 mg/cm-40 mg/cm, and even more preferably 10 mg/cm-35 mg/cm. In this embodiment, the surface area of the activated charcoal per unit cross-sectional area may be adjusted to the desired value as a result of the specific surface area of the activated charcoal and the amount of activated charcoal added being in the ranges above.

[0116] Furthermore, for the activated charcoal which may be used in this embodiment, the cumulative 10 vol% particle size (particle size D10) of activated charcoal particles is preferably 250 μm -1200 μm . Furthermore, the cumulative 50 vol% particle size (particle size D50) of activated charcoal particles is preferably 350 μm -1500 μm . It should be noted that D10 and D50 are measured by means of a laser diffraction scattering method. Apparatuses suitable for this measurement that may be cited include the "LA-950" laser diffraction/-scattering particle size distribution measurement apparatus produced by HORIBA, Ltd. A powder is poured into cells of the apparatus together with pure water, and the particle size is detected on the basis of light scattering information of the particles. The measurement conditions used in this apparatus are as follows.

Measurement mode: manual flow mode-type cell measurement

Dispersion medium: ion exchange water

Dispersion method: measurement after 1 minute of ultrasound irradiation

Refractive index: 1.92-0.00i (sample refractive index)/1.33-0.00i (dispersion medium refractive index)

Number of measurements: two measurements with different samples

[0117] In this embodiment, there is no particular restriction on the method of adding the activated charcoal to the second filtration material 251, and the activated charcoal should be added so as to be roughly uniformly dispersed in the second filtration material 251 to which the activated charcoal is added.

[0118] It should be noted that a commercially available article may be used for the filter plug 250, for example. Furthermore, there is no particular restriction on the form of the filter plug 250, and it is possible to form

a filter comprising a single filter segment, or a multi-segment filter comprising multiple filter segments, such as a dual filter or a triple filter, or the like. When the filter plug 250 comprises a single filter segment, the second filtration material 251 to which activated charcoal is added serves as the filter plug 250 without further modification. Meanwhile, when the filter plug 250 is formed by multiple filter segments, the second filtration material 251 comprising the filter material to which activated charcoal has been added is preferably disposed on the upstream side of the filter material constituting the mouthpiece end. Meanwhile, activated charcoal may also be added to the filter material constituting the mouthpiece end. It should be noted that when the filter segments constitute a multi-segment filter, the length of the filter segments, which is the basis for the amount of activated charcoal added, corresponds to the length of the filter material to which the activated charcoal has been added. The amount of activated charcoal added is, for example, 4.0 mg-24.0 mg, preferably 4.5 mg-23.0 mg, and more preferably 10.5 mg-22.0 mg, in terms of weight in relation to all of the filter segments.

[0119] The downstream portion 130 may further comprise the hollow tube portion 132 and the hollow filter portion 240. The hollow filter portion 240 is arranged adjacently downstream of the hollow tube portion 132. The hollow filter portion 240 comprises: a third filtration material 241, and a third inner plug wrap 242 wrapped around the third filtration material 241. The third inner plug wrap 242 which is used may be the same as a plug wrap used in cigarettes. The third inner plug wrap 242 may be omitted. Furthermore, the hollow filter portion 240 may be omitted.

[0120] The hollow filter portion 240 may comprise: the third filtration material 241 having one or more hollow portions; and the third inner plug wrap 242 covering the third filtration material 241. The hollow filter portion 240 has the function of increasing the strength of the downstream portion 130. The third filtration material 241 may be formed, for example, as a rod having an inner diameter of $\phi 1.0\text{ mm}$ - $\phi 5.0\text{ mm}$ packed with a high density of cellulose acetate fibers, a plasticizer comprising triacetin being added thereto in an amount of 6 mass%-20 mass%, in relation to the mass of cellulose acetate, and the plasticizer being cured. The third filtration material 241 has a high packing density of fibers, so only the air and aerosol flow through the hollow portion during drawing, with virtually none flowing through the third filtration material 241. The third filtration material 241 inside the hollow filter portion 240 is a fiber filled layer, and the user will therefore have little sense of incongruity when touching the outside during use.

[0121] The hollow filter portion 240 may comprise the third inner plug wrap 242 (wrap paper) wrapped around the third filtration material 241, from the point of view of improving strength and structural rigidity. There is no particular restriction on the form of the third inner plug wrap 242, and it may include a seam comprising one or

more lines of adhesive. There is no particular limitation as to the type of adhesive, but it may comprise a vinyl acetate-based adhesive or a hot-melt adhesive. The hot-melt adhesive may comprise polyvinyl alcohol. Furthermore, when the hollow filter portion 240 comprises two or more segments, the third inner plug wrap 242 is preferably wrapped around both of these two or more segments.

[0122] There is no particular restriction on the material of the third inner plug wrap 242, and a well-known material may be used, and it may furthermore comprise a filler such as calcium carbonate, etc. There is no particular restriction on the thickness of the third inner plug wrap 242, and it is normally 20 μm -140 μm , preferably 30 μm -130 μm , and more preferably 30 μm -120 μm . There is no particular restriction on the basis weight of the third inner plug wrap 242, but it is normally 20 gsm-100 gsm, preferably 22 gsm-95 gsm, and more preferably 23 gsm-90 gsm. Furthermore, the third inner plug wrap 242 may be coated or uncoated, but is preferably coated with a desired material from the point of view of enabling functions other than strength and structural rigidity to be imparted.

[0123] The hollow tube portion 132 is a rod-shaped member which is adjacently interposed between the flavor-generating portion 220 and the hollow filter portion 240 or the filter plug 250 (when there is no hollow filter portion 240), and is normally provided with a cavity which is cylindrical or the like, a circumferential cross section thereof forming a hollow (enclosed space). The length of the hollow tube portion 132 in the long axis direction may be appropriately varied according to the size of the product, but it is normally 15 mm or greater and preferably 20 mm or greater, and is normally 40 mm or less, preferably 35 mm or less, and more preferably 30 mm or less. By setting the length of the hollow tube portion 132 in the long axis direction at or above the abovementioned lower limit, it is possible to ensure a sufficient cooling effect and to obtain a pleasant flavor, and by setting the length at or below the abovementioned upper limit, it is possible to inhibit loss caused by adhesion of the generated vapor and aerosol to an inner wall of the hollow tube portion 132.

[0124] When the hollow tube portion 132 is filled with a sheet, etc. for cooling (e.g., a polylactic acid sheet, etc. packed in a gathered form), there is no particular restriction on the total surface area of the hollow tube portion 132, and it may be 300 mm^2/mm -1000 mm^2/mm , for example. This surface area is the surface area per length (mm) of the hollow tube portion 132 in the air flow direction. The total surface area of the hollow tube portion 132 is preferably 400 mm^2/mm or greater and more preferably 450 mm^2/mm , while preferably being 600 mm^2/mm or less, and more preferably 550 mm^2/mm or less.

[0125] The hollow tube portion 132 preferably comprises an internal structure having a large total surface area. Accordingly, in a preferred embodiment, the hol-

low tube portion 132 may be formed by a sheet which is a thin material that is creased and then fluted, gathered and folded in order to form channels. When the hollow tube portion 132 has many folds or flutes, this increases the total surface area of the hollow tube portion 132. There is no particular restriction on the thickness of the material constituting the hollow tube portion 132, and it may be 5 μm -500 μm , or may be 10 μm -250 μm .

[0126] As shown in fig. 3 and 4(a), the hollow tube portion 132 may be provided with a plurality of perforations V (also referred to as a "ventilation filter" in this technical field) which are in the circumferential direction and concentric. One perforation V may equally be provided in the hollow tube portion 132. The presence of the perforations V allows air to flow into the hollow tube portion 132 from the outside during use, and enables a reduction in the temperature of air and components flowing in from the flavor-generating portion 220. The perforations V are preferably formed in a region between 2 mm and 12 mm from the downstream end portion of the hollow tube portion 132 in the longitudinal direction (the boundary between the hollow tube portion 132 and the hollow filter portion 240 or the filter plug 250 (when there is no hollow filter portion 240)). In this case, the perforations V can not only enhance the cooling capability of the hollow tube portion 132, but also suppress stagnation of components generated by means of heating inside the hollow tube portion 132, and increase the amount of delivery of those components. It should be noted that when an aerosol base material is used in the flavor-generating portion 220, a vapor containing the aerosol base material and the tobacco flavor component generated as a result of the flavor-generating article 110 being heated is liquefied by a reduction in temperature caused by contact with external air, making it possible to promote aerosol generation.

[0127] Furthermore, if a plurality of concentric perforations V are treated as a single group of perforations, then there may be one group of perforations, or there may be two or more groups of perforations. When there are two or more groups of perforations, the groups of perforations are preferably not provided in a region less than 2 mm from the boundary between the hollow tube portion 132 and the hollow filter portion 240 or the filter plug 250 (when there is no hollow filter portion 240) (the downstream end portion of the hollow tube portion 132), from the point of view of increasing the amount of delivery of components generated by means of heating.

[0128] Furthermore, in this embodiment, the tipping paper 270 covers (wraps) the hollow tube portion 132. In this case, perforations are preferably provided in the tipping paper 270 at positions directly above the perforations V provided in the hollow tube portion 132. When a flavor-generating article 110 such as this is produced, it is possible to prepare a tipping paper 270 in which perforations have been provided in such a way

as to lie over the perforations V, and then to wrap this tipping paper 270 around, but from the perspective of ease of production, a flavor inhalation article 110 is preferably produced by using a hollow tube portion 132 without the perforations V, after which holes simultaneously penetrating the hollow tube portion 132 and the tipping paper 270 are preferably formed.

[0129] The region where the perforations V are present is preferably a region lying at least 24 mm, preferably a region lying at least 24.5 mm, preferably a region lying at least 25 mm, and more preferably a region lying at least 25.5 mm in the direction of the hollow tube portion 132 side from the mouthpiece end of the flavor-generating article 110, from the point of view of increasing delivery of components generated by means of heating. Furthermore, the region where the perforations V are present is preferably a region lying no more than 35 mm, more preferably a region lying no more than 30 mm, and even more preferably a region lying no more than 27 mm in the direction of the hollow tube portion 132 side from the mouthpiece end of the flavor-generating article 110, from the point of view of ensuring a cooling function.

[0130] Furthermore, when the axial length of the hollow tube portion 132 is 20 mm or greater, the region where the perforations V are present is preferably a region lying at least 5 mm, more preferably a region lying at least 10 mm, and even more preferably a region lying at least 13 mm in the direction of the hollow tube portion 132 side from the boundary between the hollow tube portion 132 and the flavor-generating portion 220, from the point of view of ensuring a cooling function. Furthermore, when the axial length of the hollow tube portion 132 is 20 mm or greater, the region where the perforations V are present is preferably no more than 16 mm, more preferably a region lying no more than 15.5 mm, even more preferably a region lying no more than 15 mm, and particularly preferably a region lying no more than 14.5 mm, from the boundary between the hollow tube portion 132 and the flavor-generating portion 220, from the point of view of improving delivery of components generated by means of heating.

[0131] The perforations V may be provided so that an air inflow ratio from the perforations V when the article is sucked by an automatic smoking machine at 17.5 ml/sec (a volume ratio of air that has flowed in from the perforations V when the ratio of air sucked from the mouthpiece end is 100 vol%) is 10-90 vol%, preferably 50-80 vol%, and more preferably 55-75 vol%. This air inflow ratio may be achieved by selecting a number of perforations V per group of perforations from a range of 5-50, and by selecting the diameter of the perforations V from a range of 0.1-0.5 mm. The air inflow ratio may be measured by a method based on ISO9512, using a wound article measurement machine (e.g., SODIMAX d74/SODIM, produced by S.A.S.).

[0132] There is no particular restriction on the con-

figuration of the outer plug wrap 280, and it may take a general form. Specifically, the outer plug wrap 280 may comprise pulp as its main component, for example. Pulps which may be used include wood pulps such as softwood pulp and hardwood pulp, flax pulp, hemp pulp, sisal pulp, and esparto, etc., and it is possible to use a pulp which is generally used in a wrapping paper for a tobacco article, and the outer plug wrap 280 may be obtained by a papermaking process employing one or more of these pulps. These pulps may be used alone, or several types of pulps may be combined in any proportions for use. Forms of pulp which may be used include chemical pulp, ground pulp, chemiground pulp, and thermomechanical pulp, etc. which are obtained by means of kraft digestion, acid/neutral/alkaline sulfite digestion, and soda digestion, etc. It should be noted that a commercially available article may be used for the outer plug wrap 280. There is no particular restriction on the shape of the outer plug wrap 280, and it may have a square or rectangular shape, for example.

[0133] There is no particular restriction on the basis weight of the outer plug wrap 280, but it is normally 20 gsm-70 gsm, preferably 30 gsm-50 gsm, and more preferably 34 gsm-38 gsm. There is no particular restriction on the thickness of the outer plug wrap 280, but it is normally 30 mm-80 mm, preferably 33 mm-50 mm, and more preferably 35 mm-40 mm, for example. There is no particular restriction on the air permeability of the outer plug wrap 280, and it is normally 0 CORESTA units-30,000 CORESTA units, and preferably greater than 0 CORESTA units and no greater than 10,000 CORESTA units. The air permeability is a value measured in accordance with ISO 2965:2009, and is expressed as the flow rate (cm³) of a gas passing through a surface area of 1 cm² per minute at a differential pressure of 1 kPa on both surfaces of the paper. 1 CORESTA unit (1 C.U.) constitutes cm³/(min·cm²) under 1 kPa.

[0134] The outer plug wrap 280 may comprise a loading material. Examples of loading materials which may be cited include metal carbonates such as calcium carbonate and magnesium carbonate, metal oxides such as titanium oxide, titanium dioxide, and aluminum oxide, metal sulfates such as barium sulfate and calcium sulfate, metal sulfides such as zinc sulfide, quartz, kaolin, talc, diatomaceous earth, and gypsum, etc. The outer plug wrap 280 preferably comprises calcium carbonate, especially from the point of view of improving whiteness and opaqueness, and increasing heating rate. These loading materials may be used alone, or two or more may be used in combination.

[0135] Various types of auxiliaries may be added to the outer plug wrap 280. The outer plug wrap 280 may comprise a water-resistance improving agent, for example. Water-resistance improving agents may include wet-strength agents (WS agents) and sizing agents. The wet strength agent may comprise, for example, a urea formaldehyde resin, a melamine formaldehyde re-

sin, and polyamide epichlorohydrin (PAE), etc. Furthermore, the sizing agent may comprise, for example, rosin soap, alkyl ketene dimer (AKD), alkenyl succinic anhydride (ASA), and high saponification polyvinyl alcohol having a degree of saponification of 90% or greater, etc.

[0136] A coating agent may be added to at least one of the front surface and the back surface of the outer plug wrap 280. There is no particular restriction on the coating agent, but a coating agent that can form a film on the surface of the paper and reduce liquid permeability is preferred.

[0137] There is no particular restriction on the configuration of the tipping paper 270, and it may take a general form. Specifically, the tipping paper 270 may comprise pulp as its main component, for example. Pulps which may be used include wood pulps such as softwood pulp and hardwood pulp, flax pulp, hemp pulp, sisal pulp, and esparto, etc., and it is possible to use a pulp which is generally used in a wrapping paper for a tobacco article, and the tipping paper 270 may be obtained by a papermaking process employing one or more of these pulps.

[0138] These pulps may be used alone, or several types of pulps may be combined in any proportions for use. Forms of pulp which may be used include chemical pulp, ground pulp, chemiground pulp, and thermomechanical pulp, etc. which are obtained by means of kraft digestion, acid/neutral/alkaline sulfite digestion, and soda digestion, etc. It should be noted that a commercially available article may be used for the tipping paper 270. There is no particular restriction on the shape of the tipping paper 270, and it may have a square or rectangular shape, for example. Furthermore, the flavor-generating article 110 may include one tipping paper 270, but it may equally include multiple tipping papers 270.

[0139] There is no particular restriction on the basis weight of the tipping paper 270, but it is normally 32 gsm-40 gsm, preferably 33 gsm-39 gsm, and more preferably 34 gsm-38 gsm, for example. There is no particular restriction on the air permeability of the tipping paper 270, and it is normally 0 CORESTA units-30,000 CORESTA units, and preferably greater than 0 CORESTA units and no greater than 10,000 CORESTA units. The air permeability is a value measured in accordance with ISO 2965:2009, and is expressed as the flow rate (cm³) of a gas passing through a surface area of 1 cm² per minute at a differential pressure of 1 kPa on both surfaces of the paper. 1 CORESTA unit (1 C.U.) constitutes cm³/(min·cm²) under 1 kPa.

[0140] The tipping paper 270 may comprise a loading material. Examples of loading materials which may be cited include metal carbonates such as calcium carbonate and magnesium carbonate, metal oxides such as titanium oxide, titanium dioxide, and aluminum oxide, metal sulfates such as barium sulfate and calcium sulfate, metal sulfides such as zinc sulfide, quartz, kaolin,

talc, diatomaceous earth, and gypsum, etc. The tipping paper 270 preferably comprises calcium carbonate, especially from the point of view of improving whiteness and opaqueness, and increasing heating rate. These loading materials may be used alone, or two or more may be used in combination.

[0141] Various auxiliaries may be added to the tipping paper 270. The tipping paper 270 may comprise a water-resistance improving agent, for example. Water-resistance improving agents may include wet-strength agents (WS agents) and sizing agents. The wet strength agent may comprise, for example, a urea formaldehyde resin, a melamine formaldehyde resin, and polyamide epichlorohydrin (PAE), etc. Furthermore, the sizing agent is, for example, rosin soap, alkyl ketene dimer (AKD), alkenyl succinic anhydride (ASA), and high saponification polyvinyl alcohol having a degree of saponification of 90% or greater, etc.

[0142] A coating agent may be added to at least one of the front surface and the back surface of the tipping paper 270. There is no particular restriction on the coating agent, but a coating agent that can form a film on the surface of the paper and reduce liquid permeability is preferred.

[0143] A portion of an outer surface of the tipping paper 270 may be coated with a lip-release material. A lip-release material means a material for assisting in easy separation, substantially without adhesion, of the lips and the tipping paper 270 when the user holds the mouthpiece of the flavor-generating article 110 in their mouth. The lip-release material may comprise ethyl cellulose or methyl cellulose, etc., for example. For example, the outer surface of the tipping paper 270 may be coated with a lip-release material by applying an ethyl cellulose-based or methyl cellulose-based ink to the outer surface of the tipping paper 270. In this embodiment, the lip-release material is provided at least on a predetermined mouthpiece region contacted by the user's lips when the user holds the mouthpiece in their mouth. More specifically, the lip-release material may be provided on the outer surface of the tipping paper 270 between the mouthpiece end (end portion of the filter plug 250) and the perforations V.

[0144] A mode of joining of the components constituting the flavor-generating article 110 will be described next. In fig. 3, gaps are provided between the components to make it easier to see how the components are joined, but the components of the actual flavor-generating article 110 are adjacent without gaps, as shown in fig. 4. In the flavor-generating article 110 shown in fig. 3, the five components are joined by using the outer plug wrap 280, the outer plug wrap 260, and the tipping paper 270. The outer plug wrap 280 preferably covers the flavor-generating portion 220 and the hollow tube portion 132. The flavor-generating portion 220 and the hollow tube portion can be joined by this means. Specifically, as shown in fig. 2, the outer plug wrap 280 joins the tip-end plug 112, the flavor-generating portion 220,

and the hollow tube portion 132. Here, the outer plug wrap 280 is wound so as to cover the whole of the tip-end plug 112 and the flavor-generating portion 220, and part of the hollow tube portion 132. This joined body will be referred to as a first joined body 285. Furthermore, the outer plug wrap 260 is wound so as to join the hollow filter portion 240 and the filter plug 250 while also covering same in their entirety. This joined body will be referred to as a second joined body 265. The tipping paper 270 preferably covers the filter plug 250. In this case, the hollow tube portion 132 and the filter plug 250 can be joined by means of the tipping paper 270. Specifically, the tipping paper 270 joins the first joined body 285 and the second joined body 265. Here, the tipping paper 270 covers the whole of the second joined body 265 and part of the first joined body 285, while exposing the first joined body 285 at its upstream end.

[0145] It should be noted that in the example shown in fig. 3, the outer plug wrap 280 exposes the hollow tube portion 132 at its downstream end, without covering the hollow tube portion 132 as far as its downstream end, but the hollow tube portion 132 may equally be covered as far as its downstream end. In this case, perforations are preferably provided in the outer plug wrap 280 at positions directly above the perforations V provided in the hollow tube portion 132. As a result, the perforations V are preferably provided so as to penetrate through the tipping paper 270, the outer plug wrap 280, and the hollow tube portion 132.

[0146] As shown in fig. 3, the outer plug wrap 280 preferably partially overlaps the tipping paper 270. In this case, the flavor-generating portion 220 and the hollow tube portion 132 can be more securely joined while the hollow tube portion 132 (first joined body 285) is prevented from being exposed.

[0147] As shown in fig. 1 and 2, when the flavor-generating article 110 has been suitably inserted into the heating unit 30 of the flavor inhaler 120, part of the flavor-generating article 110 may be exposed to the outside of the flavor inhaler 120. Specifically, in the state shown in fig. 1 and 2, part or all of the second joined body 265 shown in fig. 3 may be exposed to the outside of the flavor inhaler 120. Furthermore, in the state shown in fig. 1 and 2, part of the hollow tube portion 132 shown in fig. 3 or fig. 4 may be exposed to the outside of the flavor inhaler 120. In this case, the perforations V formed in the hollow tube portion 132 may be exposed to the outside of the flavor inhaler 120, or the perforations V may be positioned on the inside of the flavor inhaler 120 (upstream of an opening for insertion of the flavor-generating article 110). The perforations V formed in the hollow tube portion 132 are preferably on the inside of the flavor inhaler 120 so that the perforations V cannot easily be obstructed by the user.

[0148] The flavor-generating portion 220 may comprise: a first part which overlaps the heating source 40

of the flavor inhaler 120 along the longitudinal direction of the flavor-generating article 110; and a second part which does not overlap the heating source 40 when the flavor-generating article 110 is accommodated at the desired location in the flavor inhaler 120 shown in fig. 1. The longitudinal length of the first part of the flavor-generating portion 220 is preferably 40%-60% of the longitudinal length of the flavor-generating portion 220. Furthermore, the longitudinal length of the flavor-generating portion 220 is preferably 10 mm or less.

[0149] As described above, the flavor-generating article 110 comprises the perforations V formed penetrating the hollow tube portion 132. Preferably, external air is readily taken in from the perforations V in the flavor-generating article 110, and vapor or aerosol leakage from the perforations V is less likely. Fig. 5 is a partial enlargement in cross section of the flavor-generating article 110 shown in fig. 4(a). Specifically, fig. 5 is a partial enlargement in cross section of a perforation V formed in the hollow tube portion 132. As shown in fig. 5, the perforation V comprises a first perforation portion V1 positioned on an inner surface 132a of the hollow tube portion 132, and a second perforation portion V2 positioned on an outer surface 132b of the hollow tube portion 132. The area of the second perforation portion V2 is greater than the area of the first perforation portion V1. External air is taken in more easily than when the perforation V has the area of the first perforation portion V1 over its entirety. Furthermore, the area of the first perforation portion V1 is smaller than the area of the second perforation portion V2, so vapor or aerosol generated by the flavor-generating portion 220 can be better inhibited from leaking to the outside from the perforation V than when the perforation V has the area of the second perforation portion V2 over its entirety.

[0150] In this embodiment in particular, as shown in fig. 3 and 4, the flavor-generating article 110 comprises the tip-end plug 112 disposed upstream of the flavor-generating portion 220. There is a risk here that the vapor or aerosol generated by the flavor-generating portion 220 will stagnate inside the hollow tube portion 132 because of the tip-end plug 112, raising the pressure inside the hollow tube portion 132. However, by virtue of the flavor-generating article 110 of this embodiment, the vapor or aerosol generated by the flavor-generating portion 220 can be inhibited from leaking from the perforation V, even if the pressure inside the hollow tube portion 132 rises.

[0151] As shown in fig. 4(a) and 5, the perforation V is formed penetrating the hollow tube portion 132 and the tipping paper 270. As shown in fig. 5, the perforation V further comprises a third perforation portion V3 positioned on an outer surface 270b of the tipping paper 270, and a fourth perforation portion V4 positioned on an inner surface 270a of the tipping paper 270. Here, the area of the third perforation portion V3 is preferably greater than the area of the first perforation portion V1. In this case, the flavor-generating article 110

has a double structure comprising the hollow tube portion 132 and the tipping paper 270, therefore making it possible to further increase a difference between the area of the third perforation portion V3 and the area of the first perforation portion V1. Consequently, the vapor or aerosol generated by the flavor-generating portion 220 can be even better inhibited from leaking to the outside from the perforation V, while external air from the perforation V is taken in even more easily.

[0152] Here, a ratio of the area of the third perforation portion V3 to the area of the first perforation portion V1 is preferably 1.1 or greater. In this case, there is a sufficient difference between the area of the first perforation portion V1 and the area of the third perforation portion V3, so the vapor or aerosol generated by the flavor-generating portion 220 can be better inhibited from leaking from the perforation V, while external air is taken in more easily from the perforation V. Moreover, the ratio of the area of the third perforation portion V3 to the area of the first perforation portion V1 is preferably 2 or less.

[0153] As shown in fig. 5, the shape and area of the fourth perforation portion V4 are preferably substantially the same as the shape and area of the second perforation portion V2. When the shape and area of the fourth perforation portion V4 are the same as the shape and area of the second perforation portion V2 in this way, the perforation V penetrating the hollow tube portion 132 and the tipping paper 270 can be formed at one time by means of a laser or the like. Furthermore, in this case, substantially no step or the like is formed in the boundary region of the perforation V between the tipping paper 270 and the hollow tube, so an increase in airflow resistance in this boundary region can be inhibited.

[0154] As shown in fig. 5, the area of the third perforation portion V3 may be greater than the area of the second perforation portion V2. In this case, the third perforation portion V3 has a larger area than the second perforation portion V2, which in turn has a larger area than the first perforation portion V1, therefore making it possible to further increase the difference between the area of the third perforation portion V3 and the area of the first perforation portion V1. Consequently, the vapor or aerosol generated by the flavor-generating portion 220 can be even better inhibited from leaking to the outside from the perforation V, while external air from the perforation V is taken in even more easily.

[0155] Meanwhile, the shape and area of the fourth perforation portion V4 may be substantially the same as the shape and area of the third perforation portion V3. In this case, a thin sheet with which it is difficult to produce a substantial difference between the area of the fourth perforation portion V4 and the area of the third perforation portion V3 can be used as the tipping paper 270. This makes it possible to reduce the cost and weight of the flavor-generating article 110.

[0156] A thickness T1 of the hollow tube portion 132 is preferably 5 μm -500 μm .

[0157] If the thickness T1 is less than 5 μm , then the hollow tube portion 132 becomes excessively thin, which can reduce the difference between the area of the first perforation portion V1 and the area of the second perforation portion V2. If the thickness T1 exceeds 500 μm , then the hollow tube portion 132 becomes excessively thick and considerable energy is needed to form the perforation V. Accordingly, a difference in opening areas is ensured within the numerical range above, thereby allowing external air to be easily taken in and leakage of the vapor or aerosol to be inhibited, while the perforation V can also be easily formed. The thickness T1 of the hollow tube portion 132 is more preferably 100 μm -300 μm .

[0158] The shape of the perforation V is preferably circular, elliptical, elongated elliptical, or rectangular. When the perforation V has such a shape, the perforation V can be easily formed by means of a laser. Specifically, the first perforation portion V1 or the second perforation portion V2 is preferably circular, elliptical, elongated elliptical, or rectangular. Similarly, the third perforation portion V3 or the fourth perforation portion V4 is preferably circular, elliptical, elongated elliptical, or rectangular.

[0159] Furthermore, the length of the first perforation portion V1 in the circumferential direction is preferably greater than the length of the first perforation portion V1 in a longitudinal direction d1. In this case, the flow velocity of air flowing into the hollow tube portion 132 can be increased and the cooling capability of the hollow tube portion 132 can be further improved, as compared to when the length of the first perforation portion V1 in the circumferential direction is the same as the length thereof in the longitudinal direction d1. Similarly, the length of the second perforation portion V2 in the circumferential direction is preferably greater than the length of the second perforation portion V2 in the longitudinal direction d1. The length of the third perforation portion V3 in the circumferential direction is preferably greater than the length of the third perforation portion V3 in the longitudinal direction d1. The length of the fourth perforation portion V4 in the circumferential direction is preferably greater than the length of the fourth perforation portion V4 in the longitudinal direction d1.

[0160] Furthermore, the total of the circumferential lengths of the plurality of perforations V is preferably 40%-70% of the circumferential length of the hollow tube portion 132. Specifically, the total of the circumferential lengths of the first perforation portions V1 in the plurality of perforations V is preferably 40%-70% of the circumferential length of the inner surface 132a of the hollow tube portion 132. Furthermore, the total of the circumferential lengths of the second perforation portions V2 in the plurality of perforations V is preferably 40%-70% of the circumferential length of the outer sur-

face 132b of the hollow tube portion 132.

[0161] Embodiments of the present invention have been described above, but the present invention is not limited to those embodiments, and various modifications are possible within the scope of the technical concept disclosed in the claims, specification and drawings. Moreover, any shape or material not directly stated in the specification or drawings is also within the scope of the technical concept of the invention of this application, provided that it exhibits the action and effect of the invention of this application. For example, the flavor inhaler 120 in the embodiments above employs a configuration in which air flows in what is known as a counterflow system, but this is not limiting, and it may equally employ a configuration in which air flows in what is known as a bottom-flow system.

[0162] A number of aspects disclosed in the present specification are given below.

- (1) A flavor-generating article comprising:
a flavor-generating portion;

a hollow tube portion disposed on a downstream side of the flavor-generating portion;
and
a perforation formed penetrating the hollow tube portion, wherein
the perforation comprises a first perforation portion positioned on an inner surface of the hollow tube portion, and a second perforation portion positioned on an outer surface of the hollow tube portion, and
an area of the second perforation portion is greater than an area of the first perforation portion.

- (2) The flavor-generating article as disclosed in (1),

comprising a first wrapper covering the hollow tube portion, wherein
the perforation is formed penetrating the hollow tube portion and the first wrapper,
the perforation comprises a third perforation portion positioned on an outer surface of the first wrapper and a fourth perforation portion positioned on an inner surface of the first wrapper, and
an area of the third perforation portion is greater than the area of the first perforation portion.

- (3) The flavor-generating article as disclosed in (2), wherein

a shape and area of the fourth perforation portion are substantially the same as a shape and area of the second perforation portion.

- (4) The flavor-generating article as disclosed in (2) or (3), wherein
a shape and area of the fourth perforation portion

are substantially the same as a shape and area of the third perforation portion.

- (5) The flavor-generating article as disclosed in any of (2) to (4), wherein

a ratio of the area of the third perforation portion to the area of the first perforation portion is 1.1 or greater.

- (6) The flavor-generating article as disclosed in any one of (1) to (5),

comprising an upstream portion disposed on an upstream side of the flavor-generating portion.

- (7) The flavor-generating article as disclosed in (6), wherein

the length of the upstream portion in the longitudinal direction is 5 mm-10 mm.

- (8) The flavor-generating article as disclosed in any of (1) to (7), wherein

the thickness of the hollow tube portion is 5 μ m-500 μ m.

- (9) The flavor-generating article as disclosed in any of (1) to (8), wherein

the perforation is formed in a region between 2 mm and 12 mm from a downstream end portion of the hollow tube portion in the longitudinal direction.

- (10) The flavor-generating article as disclosed in any one of (1) to (9),

comprising a filter plug disposed on the downstream side of the hollow tube portion.

- (11) The flavor-generating article as disclosed in (10) citing (2), wherein

the first wrapper covers the filter plug.

- (12) The flavor-generating article as disclosed in any of (1) to (11),

comprising a second wrapper covering the flavor-generating portion and the hollow tube portion.

- (13) The flavor-generating article as disclosed in (12) citing (2), wherein

the second wrapper partially overlaps the first wrapper.

- (14) The flavor-generating article as disclosed in any of (1) to (13), wherein

the first perforation portion or the second perforation portion is circular, elliptical, elongated elliptical, or rectangular.

- (15) The flavor-generating article as disclosed in any of (1) to (14), wherein

a circumferential length of the first perforation portion or the second perforation portion is greater than a longitudinal length of the first perforation portion or the second perforation portion.

REFERENCE SIGNS LIST

[0163]

110: Flavor-generating article

112: Tip-end plug

132: Hollow tube portion

132a: Inner surface
 132b: Outer surface
 220: Flavor-generating portion
 250: Filter plug
 270: Tipping paper
 270a: Inner surface
 270b: Outer surface
 280: Outer plug wrap
 T1: Thickness
 d1: Longitudinal direction
 V: Perforation
 V1: First perforation portion
 V2: Second perforation portion
 V3: Third perforation portion
 V4: Fourth perforation portion

Claims

1. A flavor-generating article comprising:
 a flavor-generating portion;
 a hollow tube portion disposed on a downstream side of the flavor-generating portion;
 and
 a perforation formed penetrating the hollow tube portion, wherein
 the perforation comprises a first perforation portion positioned on an inner surface of the hollow tube portion, and a second perforation portion positioned on an outer surface of the hollow tube portion, and
 an area of the second perforation portion is greater than an area of the first perforation portion.
2. The flavor-generating article as claimed in claim 1,
 comprising a first wrapper covering the hollow tube portion, wherein
 the perforation is formed penetrating the hollow tube portion and the first wrapper,
 the perforation comprises a third perforation portion positioned on an outer surface of the first wrapper and a fourth perforation portion positioned on an inner surface of the first wrapper, and
 an area of the third perforation portion is greater than the area of the first perforation portion.
3. The flavor-generating article as claimed in claim 2,
 wherein
 a shape and area of the fourth perforation portion are substantially the same as a shape and area of the second perforation portion.
4. The flavor-generating article as claimed in claim 2 or 3, wherein
 a shape and area of the fourth perforation portion are substantially the same as a shape and area of the third perforation portion.
5. The flavor-generating article as claimed in any one of claims 2 to 4, wherein
 a ratio of the area of the third perforation portion to the area of the first perforation portion is 1.1 or greater.
6. The flavor-generating article as claimed in any one of claims 1 to 5,
 comprising an upstream portion disposed on an upstream side of the flavor-generating portion.
7. The flavor-generating article as claimed in claim 6,
 wherein
 the length of the upstream portion in the longitudinal direction is 5 mm-10 mm.
8. The flavor-generating article as claimed in any one of claims 1 to 7, wherein
 the thickness of the hollow tube portion is 5 μm -500 μm .
9. The flavor-generating article as claimed in any one of claims 1 to 8, wherein
 the perforation is formed in a region between 2 mm and 12 mm from a downstream end portion of the hollow tube portion in the longitudinal direction.
10. The flavor-generating article as claimed in any one of claims 1 to 9,
 comprising a filter plug disposed on the downstream side of the hollow tube portion.
11. The flavor-generating article as claimed in claim 10
 citing claim 2, wherein
 the first wrapper covers the filter plug.
12. The flavor-generating article as claimed in any one of claims 1 to 11,
 comprising a second wrapper covering the flavor-generating portion and the hollow tube portion.
13. The flavor-generating article as claimed in claim 12
 citing claim 2, wherein
 the second wrapper partially overlaps the first wrapper.
14. The flavor-generating article as claimed in any one of claims 1 to 13, wherein
 the first perforation portion or the second perforation portion is circular, elliptical, elongated elliptical, or rectangular.
15. The flavor-generating article as claimed in any one of claims 1 to 14, wherein

a circumferential length of the first perforation portion or the second perforation portion is greater than a longitudinal length of the first perforation portion or the second perforation portion.

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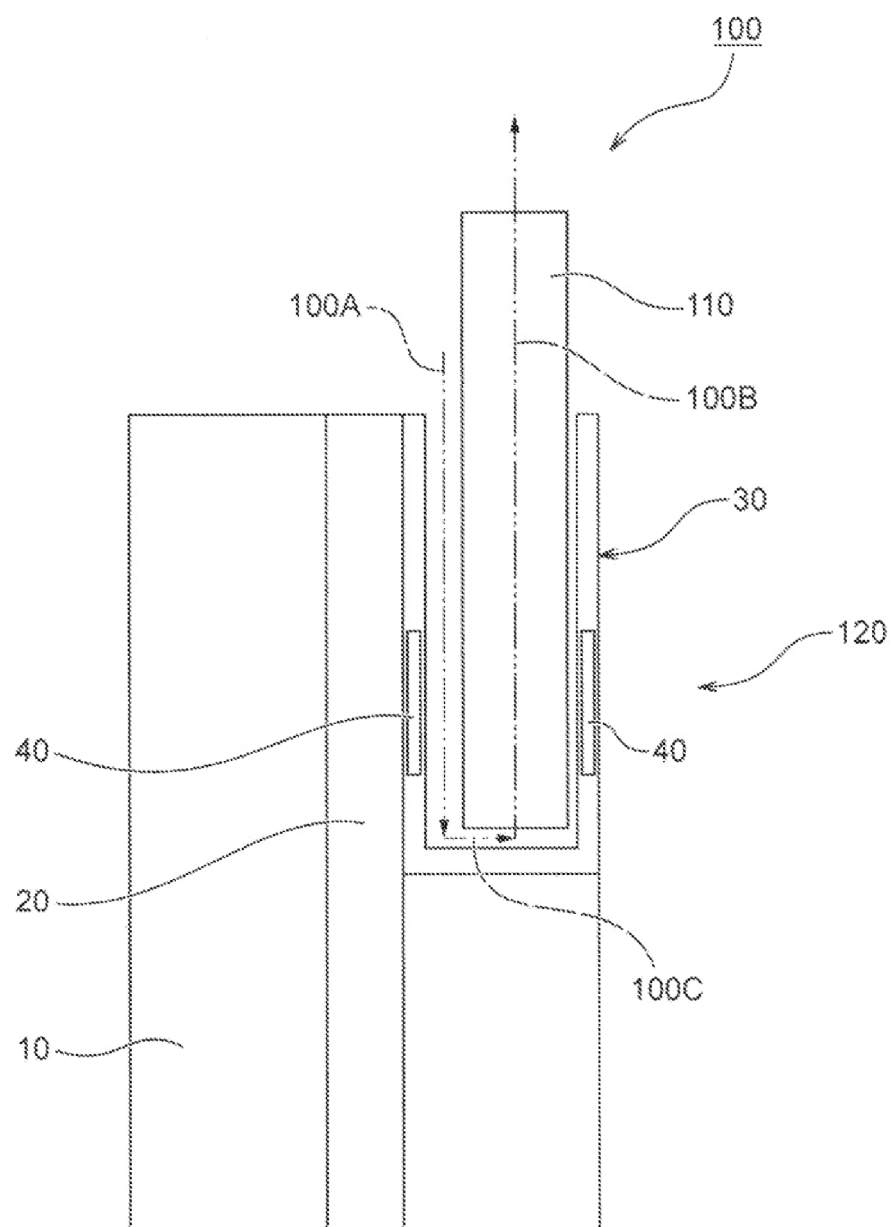
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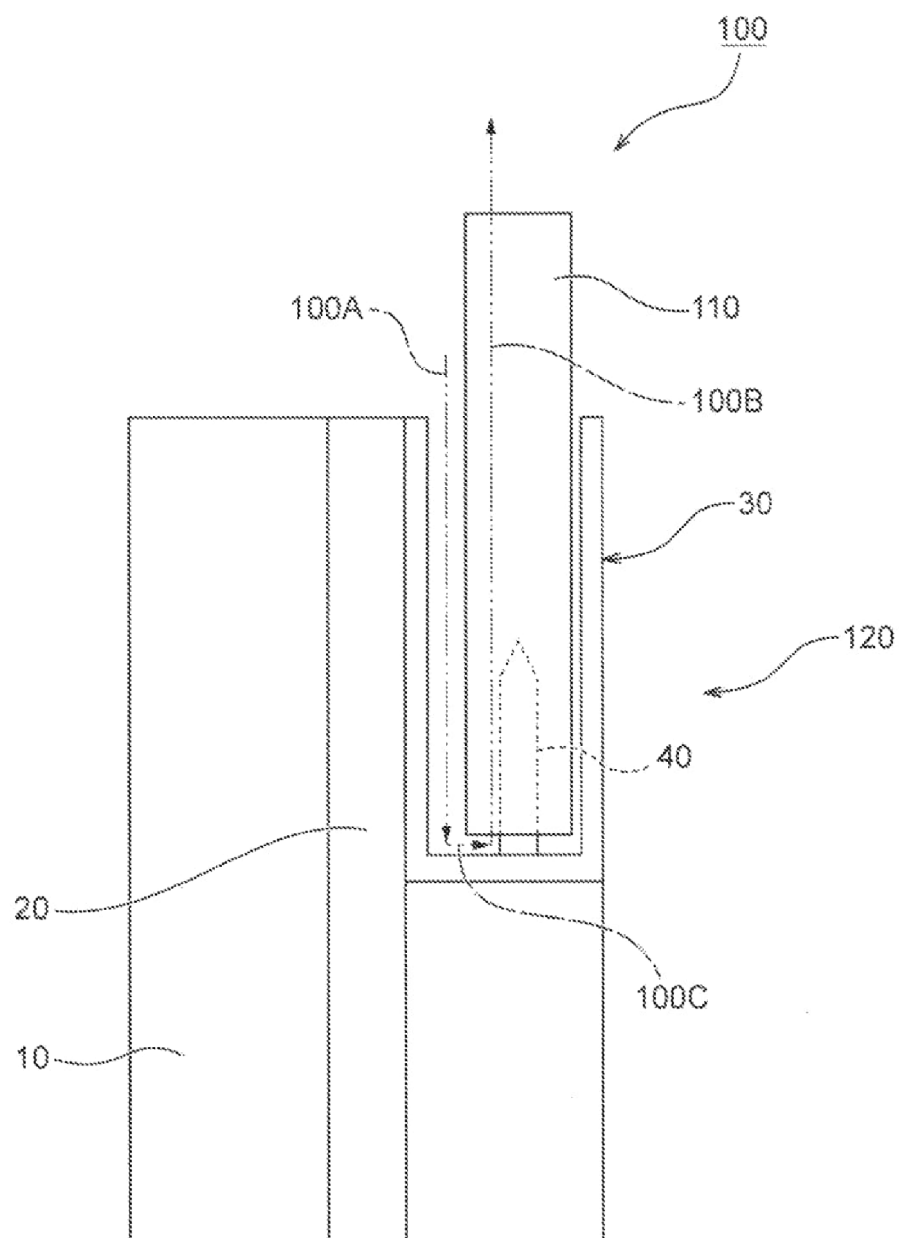
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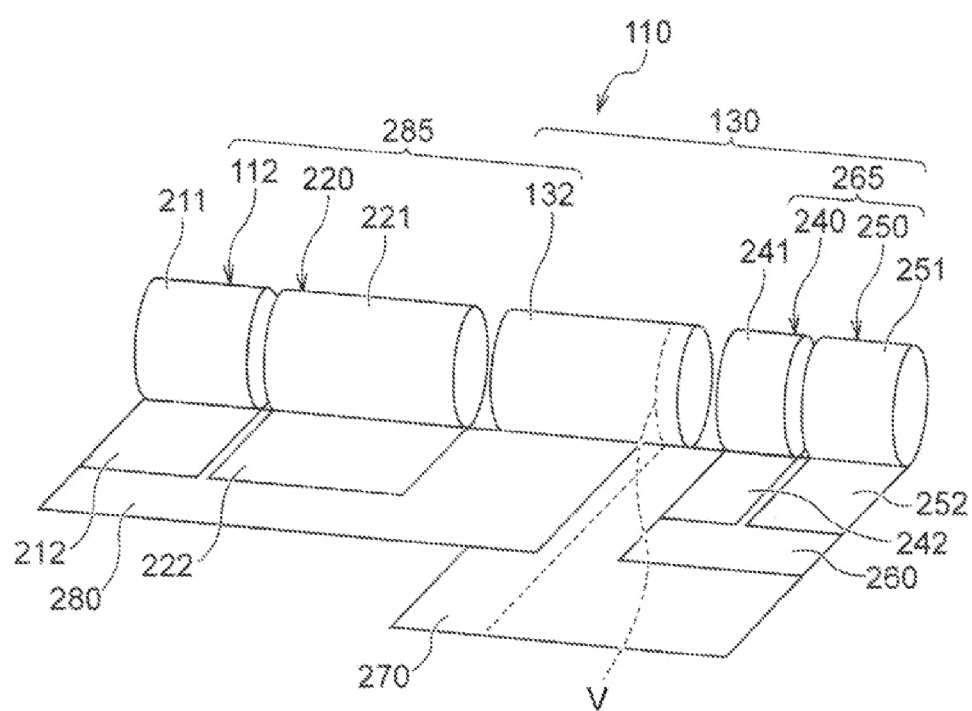
[Fig. 1]



[Fig. 2]

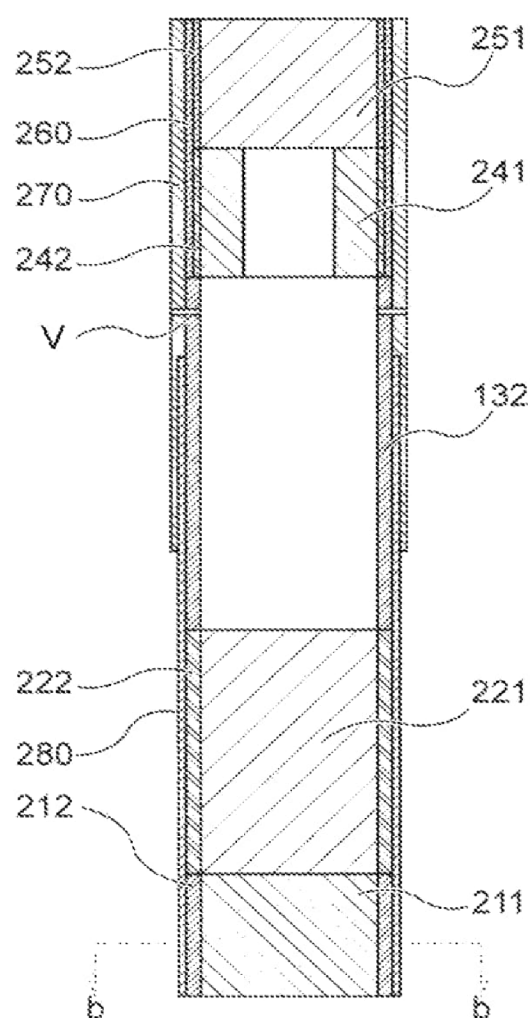


[Fig. 3]

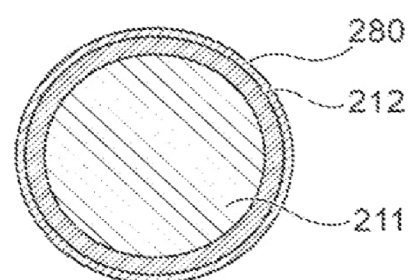


[Fig. 4]

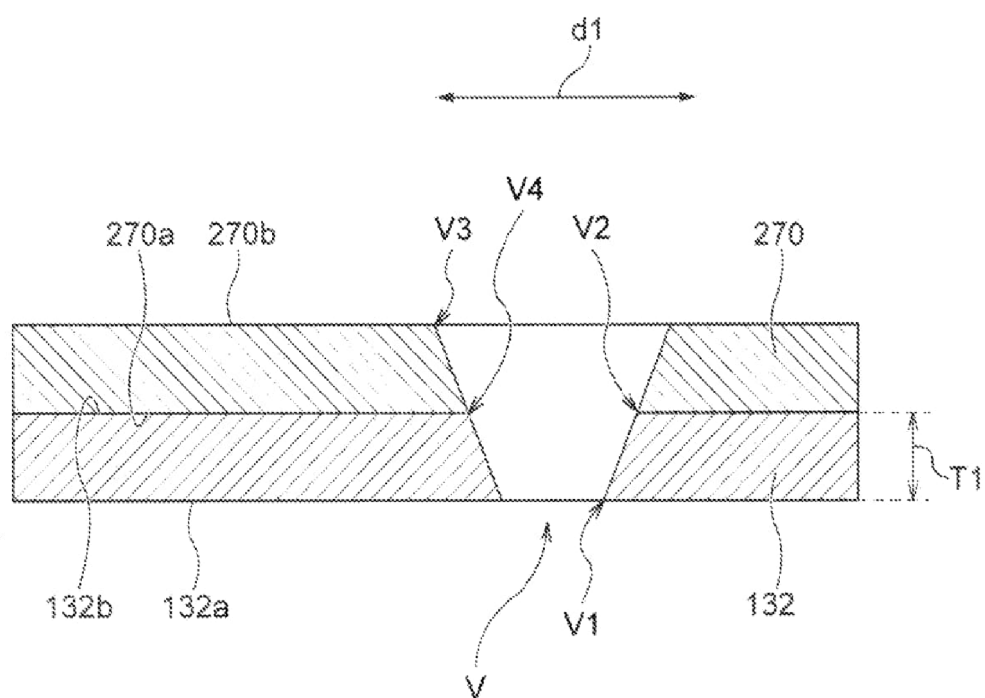
(a)



(b)



[Fig. 5]



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2023/044379

A. CLASSIFICATION OF SUBJECT MATTER**A24D 1/20**(2020.01)i

FI: A24D1/20

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A24D1/20

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

Published examined utility model applications of Japan 1922-1996
 Published unexamined utility model applications of Japan 1971-2024
 Registered utility model specifications of Japan 1996-2024
 Published registered utility model applications of Japan 1994-2024

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2022-545138 A (KT&G CORPORATION) 26 October 2022 (2022-10-26) paragraphs [0028]-[0029], [0047]-[0080], fig. 1-14	1-15
A	JP 6-46821 A (KUROKI, Setsuo) 22 February 1994 (1994-02-22) paragraphs [0025]-[0032], fig. 1-13	1-15
A	JP 2001-502900 A (ROTHMANS, BENSON & HEDGES, INC.) 06 March 2001 (2001-03-06) page 29, line 22 to page 30, line 11, fig. 20-21	1-15
A	JP 2017-507660 A (JT INTERNATIONAL S.A.) 23 March 2017 (2017-03-23) paragraphs [0017]-[0034], fig. 1-2, 5	1-15
A	WO 2020/100872 A1 (JAPAN TOBACCO INC.) 22 May 2020 (2020-05-22) paragraphs [0027]-[0028], [0033], fig. 2	1-15

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

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Date of the actual completion of the international search

06 February 2024

Date of mailing of the international search report

20 February 2024

Name and mailing address of the ISA/JP

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 Japan

Authorized officer

Telephone No.

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

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