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(54) **NON-COMBUSTION TYPE FLAVOR-GENERATING ARTICLE**

(57) A non-combustion type flavor generating article comprising a flavor source rod, a cooling portion and a filter portion, wherein:
the flavor source rod comprises a wrapper containing

pulp and a filler; and
the basis weight of the pulp in the wrapper is 40 g/m² or more and the basis weight of the filler is 3.9 g/m² or more.

EP 4 817 434 A1

Description

TECHNICAL FIELD

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

BACKGROUND ART

[0002] Non-combustion type flavor generating articles use wrappers made of paper. For example, PTL 1 discloses an article for use in a non-combustible aerosol provision system, the article including a wrapper comprising a cellulose based material having a basis weight of more than approximately 40 grams per square meter. The article is said to be highly resistant to wrinkling and other deformation when inserted into a heating device. Furthermore, PTL 2 discloses a wrapper paper containing 70-95% by mass of pulp fibers. The wrapper paper is said to be heat resistant or flame retardant and to have advantageous properties with regard to strength, ease of processing, biodegradability and impact on taste.

CITATION LIST

PATENT LITERATURE

[0003]

PTL 1: JP 2023-530900 A
PTL 2: JP 2023-532249 A

SUMMARY OF INVENTION

TECHNICAL PROBLEM

[0004] Non-combustion type flavor generating articles are required to be sufficiently strong not to break when the article is inserted into a heating device. This strength largely depends on the strength of the wrapper. Furthermore, the wrapper is required to be highly opaque in order to improve the appearance of the non-combustion type flavor generating article. It is generally known that increasing the filler content improves the opacity of the paper. However, as the filler content increases, the strength of the paper decreases. Therefore, there is a trade-off between the strength and opacity of the paper. The inventors conceived of the idea that if a wrapper could be provided that had both high strength and high opacity, a non-combustion type flavor generating article having high strength and excellent appearance could be provided. In view of the above circumstances, the present invention addresses the problem of providing a non-combustion type flavor generating article having high strength and excellent appearance.

SOLUTION TO PROBLEM

[0005] The above problem is solved by the following.

Aspect 1

[0006] A non-combustion type flavor generating article comprising a flavor source rod, a cooling portion and a filter portion, wherein:

the flavor source rod comprises a wrapper containing pulp and a filler; and
the basis weight of the pulp in the wrapper is 40 g/m² or more and the basis weight of the filler is 3.9 g/m² or more.

Non-combustion flavor inhalation article

Aspect 2

[0007] The non-combustion type flavor generating article according to aspect 1, wherein the thickness of the wrapper is 7.0-9.0 (mm/100).

Aspect 3

[0008] The non-combustion type flavor generating article according to aspect 1 or 2, wherein the opacity of the wrapper as measured in accordance with JIS P 8149 is 70% or more.

Aspect 4

[0009] The non-combustion type flavor generating article according to any one of aspects 1 to 3, wherein the basis weight of the pulp is 55 g/m² or less.

Aspect 5

[0010] The non-combustion type flavor generating article according to any one of aspects 1 to 4, wherein the basis weight of the filler is 9 g/m² or less.

Aspect 6

[0011] The non-combustion type flavor generating article according to any one of aspects 1 to 5, wherein the wrapper is provided with a coating layer on the surface thereof.

Aspect 7

[0012] The non-combustion type flavor generating article according to aspect 6, wherein the basis weight of the coating layer is 3-10 g/m².

Aspect 8

[0013] The non-combustion type flavor generating article according to any one of aspects 1 to 7, wherein the basis weight of the wrapper is 50-70 g/m².

Aspect 9

[0014] The non-combustion type flavor generating article according to any one of aspects 1 to 8, wherein a region of 60% or more of the lateral circumferential surface area of the flavor source rod is wrapped with the wrapper.

Aspect 10

[0015] The non-combustion type flavor generating article according to any one of aspects 1 to 9, provided with a tip plug on the upstream side of the flavor source rod, wherein the wrapper is wrapped around the flavor source rod and the tip plug so as to straddle the joint therebetween.

ADVANTAGEOUS EFFECTS OF INVENTION

[0016] A non-combustion type flavor generating article having high strength and excellent appearance can be provided.

BRIEF DESCRIPTION OF DRAWINGS

[0017]

Fig. 1 is a conceptual diagram showing a first aspect of a non-combustion type flavor generating article.
 Fig. 2 is a conceptual diagram showing a second aspect of a non-combustion type flavor generating article.
 Fig. 3 is a conceptual diagram showing a third aspect of a non-combustion type flavor generating article.
 Fig. 4 is a conceptual diagram showing a fourth aspect of a non-combustion type flavor generating article.
 Fig. 5 is a conceptual diagram showing a fifth aspect of a non-combustion type flavor generating article.
 Fig. 6 is a conceptual diagram showing one aspect of a non-combustion type flavor generating system.
 Fig. 7 is a diagram showing the relationship between breaking strength and opacity.
 Fig. 8 is a diagram illustrating a method for measuring breaking strength.

DESCRIPTION OF EMBODIMENTS

[0018] In the present disclosure, the range "X-Y" includes X and Y as the end values. Unless otherwise specified, the weight is the weight when stored for two or more days in an environment at 22°C with a relative humidity of 60%. Furthermore, "downstream" means the direction toward a mouthpiece end of the non-combustion type flavor generating article.

1. Non-combustion type flavor generating article

[0019] The non-combustion type flavor generating article of the present embodiment comprises a flavor source rod, a cooling portion and a filter portion. The flavor source rod comprises a wrapper containing a pulp and a filler, the pulp in the wrapper having a basis weight of 40 g/m² or more and the filler having a basis weight of 3.9 g/m² or more. The cooling portion is preferably on the downstream side of the flavor source rod, and the filter portion is preferably on the downstream side of the cooling portion. There is no limitation as to the size of the non-combustion type flavor generating article. For example, the length thereof may be 50-80 mm, and the cross-sectional diameter thereof may be approximately 5.5-7.5 mm. In one aspect, the basis weight of the paper is measured in accordance with JIS P 8124. However, if a sufficiently large test piece cannot be prepared, a small test piece may be used. A small test piece may also be used for other measurement values if a sufficiently large test piece cannot be prepared.

1-1. First aspect

[0020] Fig. 1 shows a first aspect of the non-combustion type flavor generating article. In the drawing, 100 is the non-combustion type flavor generating article, 1 is the flavor source rod, 3 is the cooling portion, 5 is the filter portion, 51 is a first segment, 52 is a second segment, and V are ventilation holes. 20 is the wrapper containing pulp and filler, the pulp having a basis weight of 40 g/m² or more and the filler having a basis weight of 3.9 g/m² or more. 40 is tipping paper.

(1) Flavor rod 1

[Wrapper]

[0021] The wrapper 20 combines high strength and high opacity, as will be explained in detail below. Consequently, the flavor source rod 1 including the wrapper 20 has a good appearance since the flavor source rod therein does not show through. Furthermore, in the non-combustion type flavor generating article 100 including the flavor source rod 1, the flavor source rod 1 is resistant to deformation or breakage even if an external force is applied during use or transport. Whereas conventional non-combustion type flavor generating articles are liable to break or become damaged when inserted into a heating device and heated, such defects can be avoided with the non-combustion type flavor generating article 100 of the present aspect.

1) Basis weight

[0022] The flavor source rod 1 is a substantially cylindrical member for generating flavor and taste components contained in a flavor source such as tobacco raw material. The flavor source rod 1 comprises a flavor source and a wrapper 20 wrapped around the flavor source. The wrapper 20 in the present embodiment contains pulp and filler, the pulp having a basis weight of 40 g/m² or more and the filler having a basis weight of 3.9 g/m² or more. If the basis weight of the pulp is less than this value, the paper will not have sufficient strength. If the basis weight of the filler is less than this value, the paper will not have sufficient opacity. It has conventionally been known that there is a trade-off between paper strength and opacity, but if the basis weight of the pulp and the basis weight of the filler are within the abovementioned ranges, high strength and high opacity can both be achieved simultaneously. From this perspective, the lower limit of the basis weight of the pulp is preferably 41 g/m² or more. The lower limit of the basis weight of the filler is preferably 7 g/m² or more.

[0023] However, if the basis weight of the pulp is too large, the rigidity of the paper may be too high and the manufacturing workability (also referred to hereinafter as "wrapping suitability") of the flavor source rod may be impaired. From this perspective, the basis weight of the pulp is preferably 55 g/m² or less. Furthermore, if the basis weight of the filler is too large, the paper may become brittle. From this perspective, the basis weight of the filler is preferably 9 g/m² or less. Therefore, the basis weight of the pulp is preferably 41-55 g/m². The basis weight of the filler is preferably 7-9 g/m².

[0024] The basis weight of the pulp and the basis weight of the filler are obtained as follows:

1) Measure the basis weight of the wrapper. If the wrapper includes a coating layer, measure the basis weight of the paper with the coating layer removed in accordance with an established method. Set the basis weight obtained in this step as B.

2) Obtain the filler content of the wrapper. The filler content can be obtained by measuring the crude ash content in accordance with an established method.

3) Obtain the pulp content of the wrapper. The pulp content is obtained by subtracting the crude ash content from the weight of the paper with the coating layer removed.

4) Obtain the basis weight of the pulp and the basis weight of the filler by dividing the basis weight B proportionally using the filler content and the pulp content.

[0025] The heating temperature for obtaining the crude ash content may be set multiple times depending on the thermal decomposition temperature of the filler. For example, if calcium carbonate accounts for a large proportion of the filler, the heating temperature may be set to 400°C.

[0026] The basis weight of the wrapper is preferably 50-70 g/m² and more preferably 50-65 g/m². The basis weight of the wrapper is the sum of the basis weight of the base paper and the basis weight of the coating layer.

2) Opacity

[0027] From the perspective of achieving a good appearance, the opacity of the wrapper 20 is preferably 70% or more, more preferably 75%, and even more preferably 78% or more. The upper limit is not limited, but in one aspect is 80% or less. That is, the opacity of the wrapper 20 is preferably 70-80%, 75-80% or 70-78%.

[0028] The opacity is measured in accordance with JIS P 8149. In JIS P 8149, a sample piece of approximately 75 mm × 150 mm is used. However, if a sample piece of this size cannot be prepared, a jig for securing the sample may be used. The jig is preferably made of black metal, and consists of a material that does not transmit or reflect light.

3) Tensile strength

[0029] From the perspective of achieving a non-combustion type flavor generating article having excellent strength, the wrapper 20 preferably has a high tensile strength (MD), but an excessively high tensile strength may reduce the wrapping suitability. From this perspective, the tensile strength is preferably 50-68 N/15 mm. The tensile strength is measured in accordance with JIS P 8113.

4) Rigidity

[0030] The rigidity of the wrapper 20 is evaluated using loop stiffness. The loop stiffness of the wrapper 20 is preferably 11 g or less. A loop stiffness value in this range provides excellent wrapping suitability. The loop stiffness is measured as follows. The loop stiffness is evaluated by measuring the stress when a sample deformed into a loop shape is compressed in the radial direction of the loop using a Loop Stiffness Tester (registered trademark) DA manufactured by Toyo Seiki Seisaku-sho, Ltd. The width of the sample is 25 mm and the compression speed is 3.3 mm/s.

5) Diffusivity

[0031] The diffusivity of the wrapper 20 is preferably 1 cm/s or less, and more preferably 0.2 cm/s. The diffusivity is an indicator of the rate of diffusion of a substance, in particular a gas, and if the wrapper 20 has a diffusivity in the abovementioned range, the flame retardancy of the wrapper is improved. The diffusivity is measured in accordance with CRM No. 77.

6) Thickness

[0032] The thickness of the wrapper 20 is preferably 7.0-9.0 (mm/100), more preferably 7.2-8.6 (mm/100), and even more preferably 7.2-7.8 (mm/100). Excessively thick wrappers tend to be more opaque, but may have lower thermal conductivity and wrapping suitability. The thickness is measured in accordance with JIS P 8118.

7) Coating layer

[0033] From the perspective of reducing wrapping stain, the wrapper 20 may have a coating layer. The basis weight of the coating layer is preferably 3-10 g/m², and more preferably 5-8 g/m². The basis weight of the coating layer is

measured using the weight of the coating layer as measured from the difference between the weight of the wrapper before coating and the weight of the wrapper after coating. The weight of the wrapper before coating may be estimated as the weight of the wrapper obtained by removing the coating layer from the coated wrapper.

[0034] Although there is no limitation on the substance constituting the coating layer, the following substances are preferred from the perspective of reducing the impact on flavor and taste: Alginic acid and salts thereof (e.g. sodium salts); polysaccharides such as pectin, guar gum, and gum arabic; cellulose derivatives such as ethyl cellulose, methylcellulose, carboxymethyl cellulose, and nitrocellulose; and starch and derivatives thereof. Examples of starch and derivatives thereof that can be cited include: ether derivatives such as carboxymethyl starch, hydroxyalkyl starch, and cationic starch; and ester derivatives such as starch acetate, starch phosphate, and starch octenyl succinate. Particularly preferred substances include gum arabic, pectin and starch. The wrapper 20 preferably wraps the flavor source such that the coating layer is disposed on the inside of the wrapper 20. The spread of wrapping stain can be suppressed by disposing the coating layer on the inside of the wrapper 20.

8) Wrapping region

[0035] Preferably, a region of 60% or more of the lateral circumferential area of the flavor source rod 1 is wrapped with the wrapper 20. The ratio W/T between the region W wrapped by the wrapper 20 and the total lateral circumferential area T of the flavor source rod 1 is preferably 60-100%, 70-100%, or 75-100%. If W/T is 60% or more, sufficient strength is achieved even when not used together with another wrapper. Therefore, in a more preferred aspect, the region W is wrapped only with the wrapper 20. As shown in fig. 1, the wrapper 20 may be continuous around the lateral circumference of the flavor source rod 1. Furthermore, the wrapper 20 may equally be discontinuous around the lateral circumference of the flavor source rod 1. Aspects in which the wrapper 20 is discontinuous around the lateral circumference of the flavor source rod 1 include the following. An aspect in which the wrapper 20 exists in stripes such that the longitudinal direction of the regions in which the wrapper 20 exists are substantially parallel to the longitudinal direction of the flavor source rod 1. An aspect in which the wrapper 20 exists in stripes such that the longitudinal direction of the regions in which the wrapper 20 exists are substantially parallel to the circumferential direction of the flavor source rod 1. An aspect in which the wrapper 20 exists in a helical shape extending in the longitudinal direction of the flavor source rod 1. However, the wrapper 20 is preferably continuous around the lateral circumference of the flavor source rod 1 from the perspective of manufacturing efficiency, etc.

[Flavor source]

[0036] There is no limitation as to the shape of the flavor source packed inside the wrapper, and examples of shapes that may be cited include a sheet, a cut material obtained by cutting the sheet into widths of 0.8-1.2 mm, and shreds obtained by cutting the sheet to widths of 0.8-1.2 mm, etc. The flavor source rod may also be obtained by packing the wrapper with the sheet which has been gathered, folded or rolled, rather than being cut. The sheet may also be cut into strips and filled concentrically in the wrapper to obtain the flavor source rod. Alternatively, the flavor source rod may be obtained by cutting the sheet into strips and filling the wrapper with the strips such that the longitudinal direction of the strips is parallel to the longitudinal direction of the flavor source rod.

[0037] There is no particular limitation as to the packing density of the flavor source, but it is normally 200-800 mg/cm³, and preferably 250-600 mg/cm³, from the perspective of ensuring the characteristics of the non-combustion type flavor generating article and imparting a pleasant smoking flavor. There is no limitation as to the length of the flavor source rod, but it is preferably 10-25 mm. There is also no limitation as to the diameter thereof, but it is preferably 6-8 mm.

[0038] The flavor source may generate a vapor when heated. There is no limitation as to the heating temperature, but it is normally approximately 30-400°C. An aerosol source such as a polyol, including glycerol, propylene glycol or 1,3-butanediol, may be added to the tobacco material in order to promote aerosol generation. The amount of aerosol source which is added is preferably 5-50 wt%, and more preferably 10-30 wt% with respect to the dry weight of the flavor source. Flavor sources that can be cited include tobacco materials derived from tobacco, and materials in which a flavoring is supported on a carrier, etc. Of these, the flavor source is preferably a tobacco material. Well-known flavorings may also be added to the tobacco material.

(2) Cooling portion

[0039] The cooling portion 3 is adjacently downstream of the flavor source rod 1. Downstream refers to the direction toward the mouthpiece end. The cooling portion 3 is a member for promoting aerosol formation by, for example, cooling the smoking flavor components and vapor generated by the flavor source rod 1. The cooling portion 3 may be a hollow paper tube. The paper tube is preferably made of cardboard having a higher rigidity than the tipping paper.

Ventilation holes V (openings) may be provided in the paper tube. Multiple ventilation holes are preferably provided along the circumference of the paper tube. The cooling portion 3 may furthermore be packed with a gathered sheet in order to improve heat exchange efficiency. There is no limitation as to the dimensions of the cooling portion 3, but it preferably has a length of 10-25 mm and preferably has a diameter of 5.5-7.5 mm. The tipping paper may be made of known paper.

(3) Filter portion

[0040] In the present aspect, the filter portion 5 comprises a first segment 51 and a second segment 52. The first segment 51 is preferably a solid filter, for example an acetate filter. Furthermore, the second segment 52 may be a center hole filter, for example a hollow acetate filter. There is no limitation as to the dimensions of the filter portion 5, but it preferably has a length of 15-30 mm and preferably has a diameter of 5.5-7.5 mm. The length of the first segment 51 is preferably 5-10 mm, and the length of the second segment 52 is preferably 10-20 mm.

[0041] In the present aspect, the first segment 51 is wrapped with an inner plug wrapper 61. The first segment 51 and the second segment 52 are joined by being wrapped with an outer plug wrapper 62. Furthermore, the filter portion 5 and the cooling portion 3 are joined using tipping paper 40. The inner plug wrapper and the outer plug wrapper may be made of known paper.

1-2. Second aspect

[0042] Fig. 2 shows a second aspect of a combustion-type flavor generating article 100. In the drawing, 9 represents a tip plug, and 42 represents a second tipping paper. Other reference signs are defined in the same way as in fig. 1. The tip plug 9 is provided to impart functionality. For example, the tip plug 9 can be a solid filter. In this case, the flavor source can be prevented from falling out from the tip end of the combustion-type flavor generating article 100. Furthermore, if the tip plug 9 supports a flavoring, the tip plug 9 can also deliver a flavor. The second tipping paper may be made of known paper.

[0043] In the present aspect, the tip plug 9 and the flavor source rod 1 are wrapped and joined with the wrapper 20. Then, the tip plug 9, the flavor source rod 1 and the cooling portion 3 are joined together with the second tipping paper 42. Since the wrapper 20 exists across the joint between the tip plug 9 and the flavor source rod 1, the strength of the joint can be increased. Although conventional combustion-type flavor generating articles are prone to breaking at the joints between members, such defects are avoided in the combustion-type flavor generating article 100 of the present aspect. The second aspect differs from the first aspect by the provision of the tip plug 9 and in terms of the wrapping, but is otherwise identical to the first aspect. Generally, the term "wrapper" is often used to mean a material that wraps one member, but in the present disclosure a material that wraps one or more members is referred to as a "wrapper".

1-3. Third aspect

[0044] Fig. 3 shows a third aspect of a combustion-type flavor generating article. The reference signs in the drawing are defined as in fig. 2. In the present aspect, the tip plug 9 and the flavor source rod 1 are wrapped and joined with the second tipping paper 42. Then, the tip plug 9, the flavor source rod 1 and the cooling portion 3 are joined together with the wrapper 20. In the present aspect also, since the wrapper 20 exists across the joint between the tip plug 9 and the flavor source rod 1, the strength of the joint can be increased. The third aspect differs from the second aspect in terms of wrapping, but is otherwise identical to the second aspect.

1-4. Fourth aspect

[0045] Fig. 4 shows a fourth aspect a combustion-type flavor generating article 100. The reference signs in the drawing are defined as in fig. 2. In the present aspect, the tip plug 9 is wrapped with a second wrapper 22 and the flavor source rod 1 is wrapped with the wrapper 20. Then, the tip plug 9, the flavor source rod 1 and the cooling portion 3 are joined together with the second tipping paper 42. The second wrapper 22 may be made of known paper different from the wrapper 20, or may be made of the same paper as the wrapper 20. The fourth aspect differs from the second aspect in terms of wrapping, but is otherwise identical to the second aspect.

1-5. Fifth aspect

[0046] Fig. 5 shows a fifth aspect of a combustion-type flavor generating article 100. The reference signs in the drawing are defined as in fig. 2. In the present embodiment, the tip plug 9 is wrapped with the second wrapper 22 and the flavor source rod is wrapped with a third wrapper 23. Then, the tip plug 9, the flavor source rod 1 and the cooling

portion 3 are joined together with the wrapper 20. The second wrapper may use the same paper as the wrapper 20. The second wrapper may use paper having a lower pulp basis weight than the wrapper 20. The third wrapper 23 may be made of known paper different from the wrapper 20, or may be made of the same paper as the wrapper 20. Furthermore, the third wrapper 23 may be made of paper having a lower pulp basis weight than the wrapper 20. The second wrapper 22 and the third wrapper 23 are made of paper having a lower pulp basis weight than the wrapper 20 to maintain manufacturability. The fifth aspect differs from the second aspect in terms of wrapping, but is otherwise identical to the second aspect.

2. Non-combustion type flavor generating system

[0047] A combination of a non-combustion type flavor generating article and a heating unit is also referred to as a non-combustion type flavor generating system. Fig. 6 shows one aspect of such a system. In the drawing, 100 is a non-combustion type flavor generating article, and 30 is a heating unit comprising a heater. The heating unit comprises the heater, a housing, and a power source, etc.

[0048] The heater preferably heats the flavor source rod 1 electrically. A type of heater that heats from the outer circumference of the flavor source rod 1 (external heating system) can be used. Furthermore, a type of heater that is inserted into the flavor source rod 1 and heats from the inside may equally be used. In particular, the non-combustion type flavor generating article according to the present embodiment exhibits the remarkable effect that the flavor source rod 1 can be prevented from breaking in an external heating system.

[0049] Furthermore, the non-combustion type flavor generating system may equally be a system that employs induction heating (IH). In this aspect, the heating unit 30 is configured by an induction coil. The heating unit is normally disposed at the outer circumference of the flavor source rod 1. Then, the flavor source rod 1 may include a susceptor that is heated by means of a magnetic field generated by energizing the induction coil.

[0050] Preferred embodiments are disclosed below.

Aspect 1

[0051] A non-combustion type flavor generating article comprising a flavor source rod, a cooling portion and a filter portion, wherein:

the flavor source rod comprises a wrapper containing pulp and a filler; and
the basis weight of the pulp in the wrapper is 40 g/m² or more and the basis weight of the filler is 3.9 g/m² or more.

Non-combustion flavor inhalation article

Aspect 2

[0052] The non-combustion type flavor generating article according to aspect 1, wherein the thickness of the wrapper is 7.0-9.0 (mm/100).

Aspect 3

[0053] The non-combustion type flavor generating article according to aspect 1 or 2, wherein the opacity of the wrapper as measured in accordance with JIS P 8149 is 70% or more.

Aspect 4

[0054] The non-combustion type flavor generating article according to any one of aspects 1 to 3, wherein the basis weight of the pulp is 55 g/m² or less.

Aspect 5

[0055] The non-combustion type flavor generating article according to any one of aspects 1 to 4, wherein the basis weight of the filler is 9 g/m² or less.

Aspect 6

[0056] The non-combustion type flavor generating article according to any one of aspects 1 to 5, wherein the

wrapper is provided with a coating layer on the surface thereof.

Aspect 7

- 5 **[0057]** The non-combustion type flavor generating article according to aspect 6, wherein the basis weight of the coating layer is 3-10 g/m².

Aspect 8

- 10 **[0058]** The non-combustion type flavor generating article according to any one of aspects 1 to 7, wherein the basis weight of the wrapper is 50-70 g/m².

Aspect 9

- 15 **[0059]** The non-combustion type flavor generating article according to any one of aspects 1 to 8, wherein a region of 60% or more of the lateral circumferential surface area of the flavor source rod is wrapped with the wrapper.

Aspect 10

- 20 **[0060]** The non-combustion type flavor generating article according to any one of aspects 1 to 9, provided with a tip plug on the upstream side of the flavor source rod, wherein the wrapper is wrapped around the flavor source rod and the tip plug so as to straddle the joint therebetween.

EXAMPLES

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[Example 1]

[0061] Paper having a pulp basis weight of 42.6 g/m², a filler basis weight of 7.6 g/m², and an overall basis weight of 50.2 g/m² was prepared. The physical properties shown in Table 1 were evaluated for the paper.

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[0062] The paper was used as a wrapper which was wrapped around tobacco shreds in accordance with an established method to produce a tobacco rod having a diameter of 6.9 mm and a length of 14 mm, and the workability (wrapping suitability) during wrapping was evaluated. Furthermore, a pseudo-rod sample was prepared and the breaking strength of the tobacco rod was measured by the method described below. Specifically, the sample was produced as follows. First, a paper tube X having a length of 15.5 mm and a paper tube Y having a length of 44.5mm were prepared. Next, the two tubes were wrapped with the paper (wrapper) to prepare a sample in which the paper tubes X and Y were connected. The measurement results are shown in Table 1.

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EXAMPLES 2-6

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[0063] Other than that the paper shown in Table 1 was used, the same method as for example 1 was used to evaluate the paper, tobacco rod and pseudo rod sample. However, in examples 3 to 5 paper with a coating layer was used.

COMPARATIVE EXAMPLES 1-8

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[0064] Other than that the paper shown in Table 1 was used, the same method as for example 1 was used to evaluate the paper, tobacco rod and pseudo rod sample. However, in comparison examples 1-4, paper with a coating layer was used. The relationship between breaking strength and opacity is shown in fig. 7.

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REFERENCE EXAMPLES 1-3

[0065] The paper shown in Table 1 was prepared and evaluated using the same method as for example 1.

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[Table 1]

	Paper basis weight gsm	Coating basis weight gsm	Filler content wt%	Fill basis weight gsm	Pulp basis weight gsm	Tensile strength (MD) N/15mm	Breaking strength N	Whiteness %	Opacity %	Loop stiffness g	Wrapping suitability	Diffusivity cm/sec	Thickness mm/100
Example 1	50.2	0	15.2	7.6	42.6	53.5	3.60	86.3	78.7	5.8	A	0.17	7.2
Example 2	54.9	0	15.4	8.5	46.4	55.6	3.70	86.2	78.9	7.6	A	0.20	7.6
Example 3	54.7	5	16.7	8.6	41.1	60.3	3.90	86.8	77.7	7	A	0.00	7.2
Example 4	58.6	5	14.6	8.5	45.1	65.9	3.80	85.6	77.6	8.8	A	0.00	7.7
Example 5	64.6	5	6.0	3.9	55.7	76.8	5.40	86.7	76.3	14.1	B	0.00	6.6
Example 6	60	0	6.5	3.9	55.1	66.4	4.37	87.6	78.3	11.1	B	0.20	8.2
Comparative example 1	42.6	5.9	21.5	9.2	27.5	36.3	2.58	87.5	79.4		A	0.01	4.5
Comparative example 2	49.9	5.6	24.9	12.4	32.0	44.9	2.95	87.5	84.1		A	0.00	
Comparative example 3	50.9	7.4	6.1	2.6	40.9	64.6	3.87	84.4	63.2	4.5	A	0.00	5.4
Comparative example 4	56.3	5.4	0.0	0.0	60.9	61.2	7.66	82.3	62.9		A	0.00	
Comparative example 5	35.69	0	25.1	9.2	27.5	35.4	2.90	88.9	79.8			0.10	4.25
Comparative example 6	36.7	0	25.0	9.2	27.5	35.4	2.86	88.9	79.8		A	0.11	
Comparative example 7	43.5	0	6.0	2.6	40.9	54.5	4.09	86.2	63.9		A	0.08	5
Comparative example 8	50.9	0	0.0	0.0	50.9	59.2	6.83	84.3	62.3			0.07	
Reference example 1	46	0	4.7	21.6	24.4			92.9	97.3				
Reference example 2	25.9	0	28.5	7.4	18.5			89.8	76.6				
Reference example 3	27.5	0	16.7	4.6	22.9			88.8	64.8				

[0066] The evaluation was carried out as follows.

[Opacity]

[0067] Measurements were performed in accordance with JIS P 8149 using a WMS-1 (manufactured by Murakami Color Research Laboratory Co., Ltd.). However, if a sample piece with a size of 75 mm × 150 mm could not be prepared, a jig was used to secure the sample. The jig was made of black metal, a material that suppresses light transmission and reflection.

[Tensile strength]

[0068] Measurements were carried out in accordance with JIS P 8113.

[Brightness]

[0069] Measurements were carried out in accordance with JIS P 8148 using a WMS-1 (manufactured by Murakami Color Research Laboratory Co., Ltd.). However, if a sample piece with a size of 75 mm × 150 mm could not be prepared, a jig was used to secure the sample. The jig was made of black metal, a material that suppresses light transmission and reflection.

[Loop stiffness]

[0070] The specimen was deformed into a loop shape and was evaluated by measuring the stress when the specimen was compressed in the radial direction of the loop using a Loop Stiffness Tester (registered trademark) DA manufactured by Toyo Seiki Seisaku-sho, Ltd. The width of the sample was 25 mm and the compression speed was 3.3 mm/s.

[Wrapping suitability]

[0071] Tobacco rods were produced under the following conditions using a 3D-100 tobacco rod making machine (manufactured by Decouflé), and the workability at that time was evaluated.

Amount of glue: 10 g/500 m

Temperature: 200°C

Rod cutting length: 56 mm

Examples 1 to 4 were rated A because no punctures occurred even when produced at 3,500 rods/min or more.

Examples 5 and 6 were rated B because there were weakly glued rods at 2,700 rods/min, although there were no punctures at 2,500 rods/min.

[Diffusivity]

[0072] Measurements were carried out in accordance CRM No. 77.

[Breaking strength]

[0073] Fig. 8 shows an overview of the measurement method. A paper tube X having a length of 15.5 mm and a paper tube Y having a length of 44.5 mm were prepared. The two tubes were wrapped with the paper (wrapper) to prepare a pseudo-rod sample 200 in which the paper tubes X and Y were connected. The joint J between the paper tubes X and Y was heated at 295°C for 5 minutes. The sample was fixed onto a stage S such that the joint J acted as a fulcrum, and the end face of the paper tube X was depressed with a plunger P to break the sample at the joint J. The stress at this time was taken as the breaking strength.

REFERENCE SIGNS LIST

[0074]

100 Non-combustion type flavor generating article

1 Flavor source rod

3 Cooling portion

5 Filter portion

51 First segment

52 Second segment

9 Tip plug

V Ventilation hole

20 Wrapper having specific pulp and filler basis weights

22 Second wrapper

40 Tipping paper

42 Second tipping paper
 200 Sample
 X Paper tube
 Y Paper tube
 J Joint
 S Stage
 P Plunger

Claims

1. A non-combustion type flavor generating article comprising a flavor source rod, a cooling portion and a filter portion, wherein:

the flavor source rod comprises a wrapper containing pulp and a filler; and
 the basis weight of the pulp in the wrapper is 40 g/m² or more and the basis weight of the filler is 3.9 g/m² or more.

Non-combustion flavor inhalation article

2. The non-combustion type flavor generating article as claimed in claim 1, wherein the thickness of the wrapper is 7.0-9.0 (mm/100).

3. The non-combustion type flavor generating article as claimed in claim 1 or 2, wherein the opacity of the wrapper as measured in accordance with JIS P 8149 is 70% or more.

4. The non-combustion type flavor generating article as claimed in any one of claims 1 to 3, wherein the basis weight of the pulp is 55 g/m² or less.

5. The non-combustion type flavor generating article as claimed in any one of claims 1 to 4, wherein the basis weight of the filler is 9 g/m² or less.

6. The non-combustion type flavor generating article as claimed in any one of claims 1 to 5, wherein the wrapper is provided with a coating layer on the surface thereof.

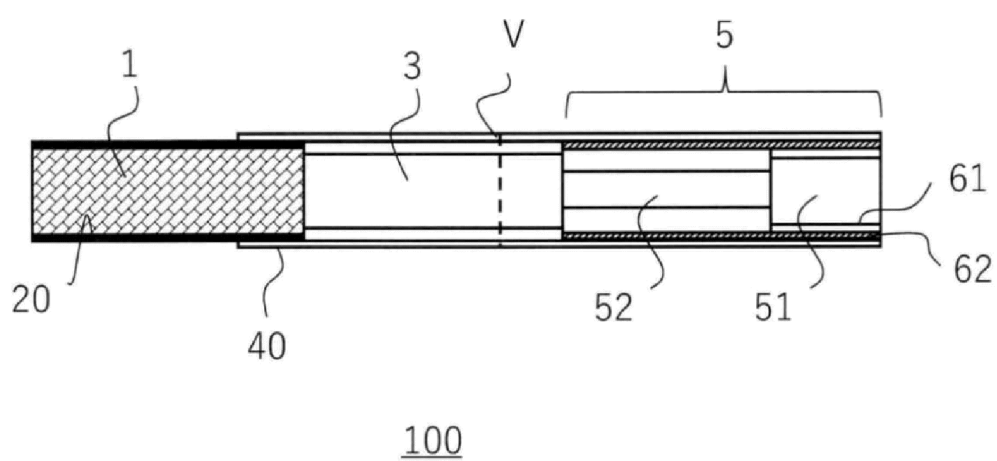
7. The non-combustion type flavor generating article as claimed in claim 6, wherein the basis weight of the coating layer is 3-10 g/m².

8. The non-combustion type flavor generating article as claimed in any one of claims 1 to 7, wherein the basis weight of the wrapper is 50-70 g/m².

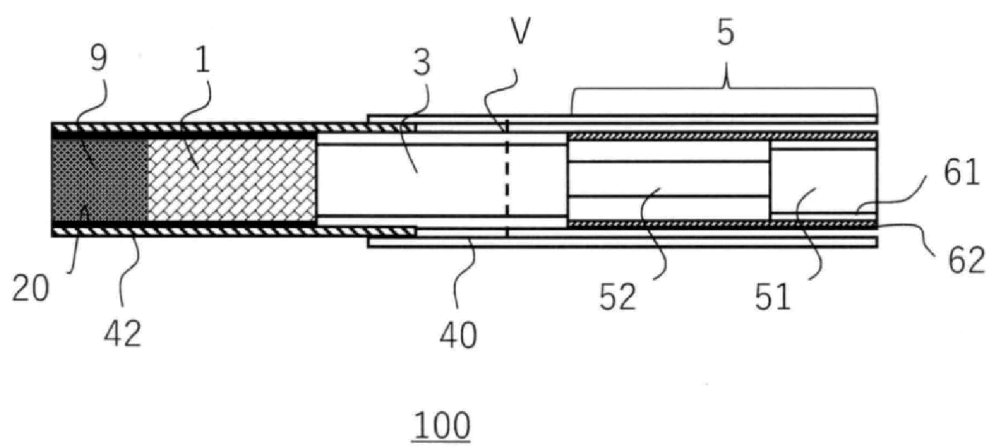
9. The non-combustion type flavor generating article as claimed in any one of claims 1 to 8, wherein a region of 60% or more of the lateral circumferential surface area of the flavor source rod is wrapped with the wrapper.

10. The non-combustion type flavor generating article as claimed in any one of claims 1 to 9, provided with a tip plug on the upstream side of the flavor source rod, wherein the wrapper is wrapped around the flavor source rod and the tip plug so as to straddle the joint therebetween.

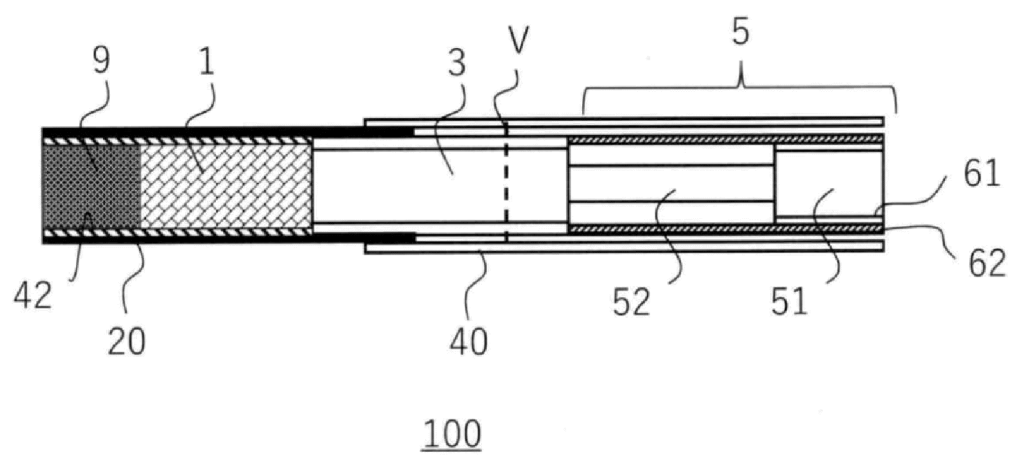
[Fig. 1]



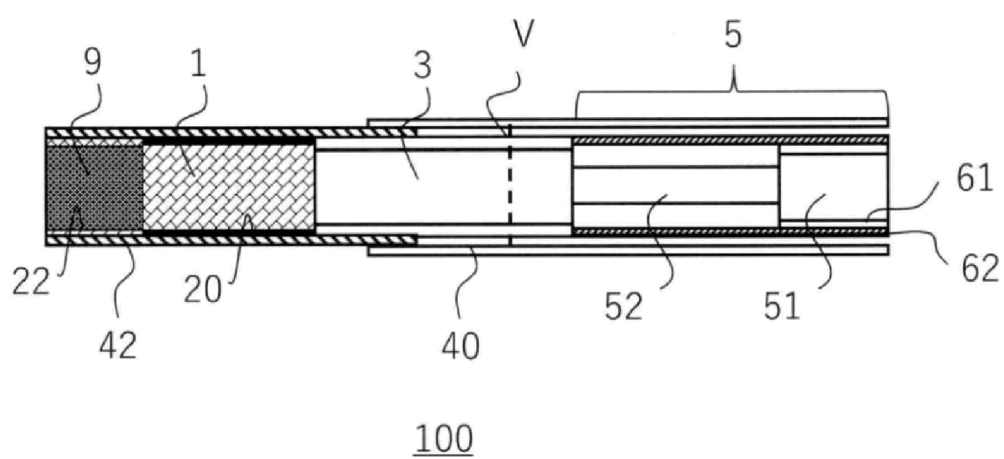
[Fig. 2]



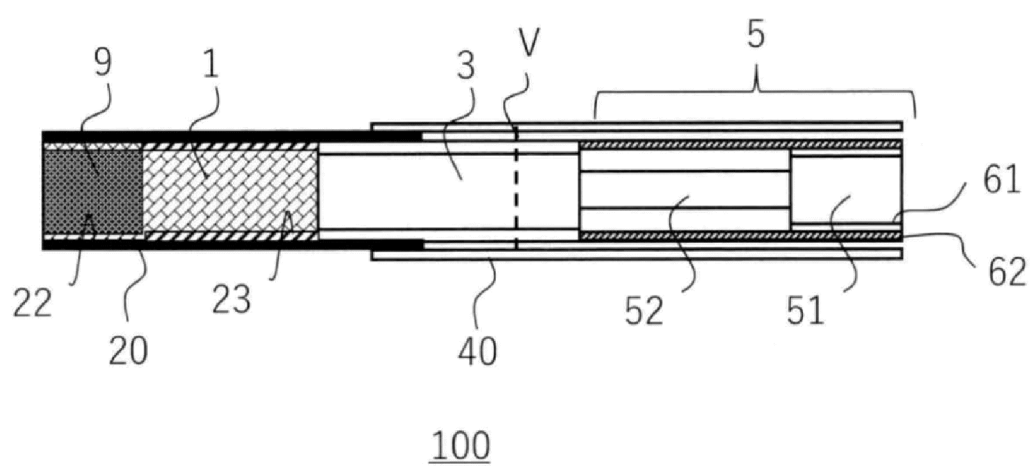
[Fig. 3]



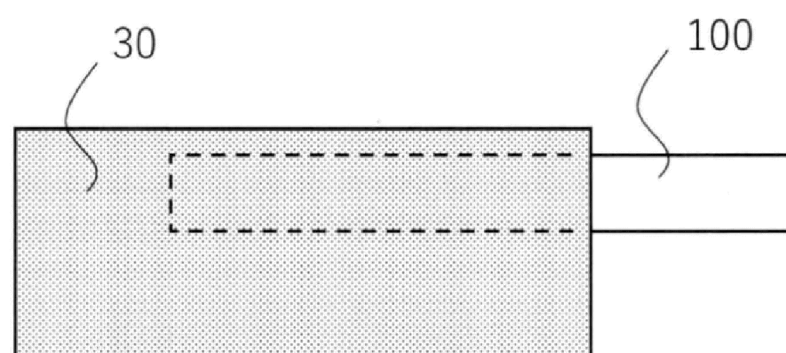
[Fig. 4]



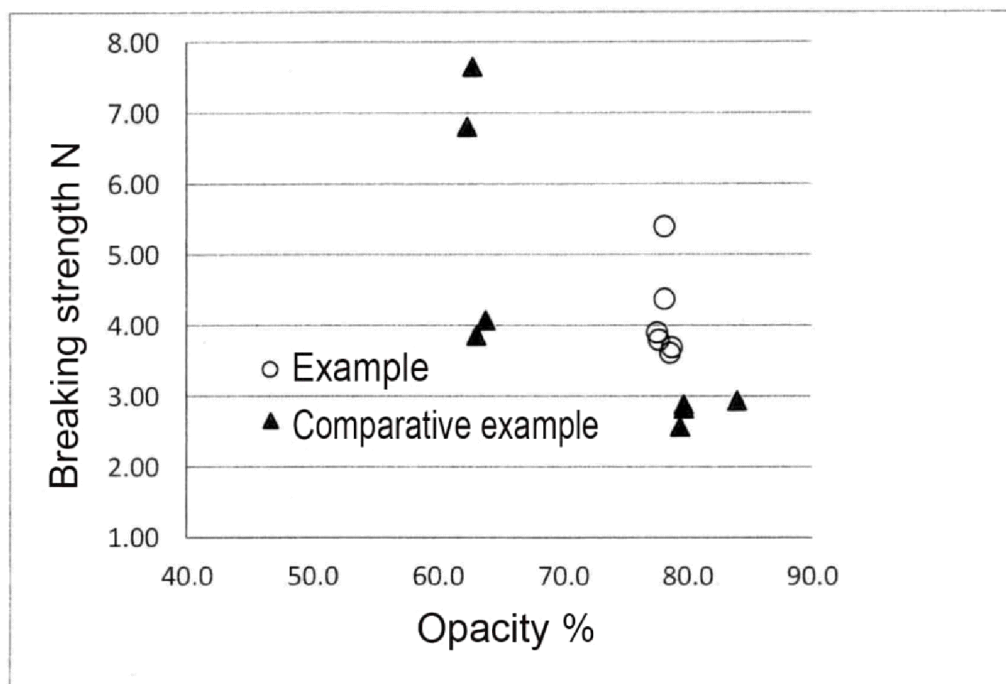
[Fig. 5]



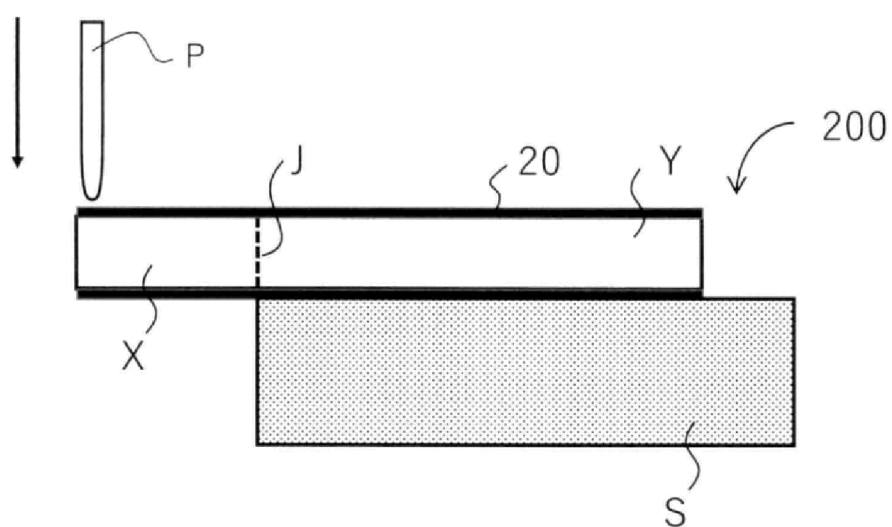
[Fig. 6]



[Fig. 7]



[Fig. 8]



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2023/042900

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 1971-2023
Registered utility model specifications of Japan 1996-2023
Published registered utility model applications of Japan 1994-2023

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2019/211890 A1 (JAPAN TOBACCO INC.) 07 November 2019 (2019-11-07) paragraphs [0017]-[0021], [0025]-[0026], fig. 1	1-2
Y		1-10
Y	WO 02/092913 A1 (JAPAN TOBACCO INC.) 21 November 2002 (2002-11-21) description, p. 5, lines 3-7	1-10
Y	WO 2007/119484 A1 (JAPAN TOBACCO INC.) 25 October 2007 (2007-10-25) paragraph [0012]	1-10
Y	WO 2020/230577 A1 (JAPAN TOBACCO INC.) 19 November 2020 (2020-11-19) paragraphs [0028]-[0035], fig. 2-3	3-10
Y	JP 2020-511998 A (KT&G CORPORATION) 23 April 2020 (2020-04-23) paragraphs [0117]-[0119], fig. 8B	10

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

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"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/JP2023/042900

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REFERENCES CITED IN THE DESCRIPTION

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