



US 20250127209A1

(19) **United States**

(12) **Patent Application Publication**  
**NAGAMATSU et al.**

(10) **Pub. No.: US 2025/0127209 A1**

(43) **Pub. Date: Apr. 24, 2025**

(54) **WRAPPER FOR  
NON-COMBUSTION-HEATED FLAVOR  
INHALATION ARTICLE**

**Related U.S. Application Data**

(63) Continuation of application No. PCT/JP2022/027204, filed on Jul. 11, 2022.

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**Publication Classification**

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(51) **Int. Cl.**  
*A24D 1/02* (2006.01)  
*A24D 1/20* (2020.01)

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(52) **U.S. Cl.**  
CPC *A24D 1/02* (2013.01); *A24D 1/20* (2020.01)

(21) Appl. No.: **19/010,242**

(57) **ABSTRACT**

(22) Filed: **Jan. 6, 2025**

A wrapper for a non-combustion-heated flavor inhalation article comprising a base paper that has a basis weight of at least 40 g/m<sup>2</sup> and contains not more than 10 wt % of a filler.

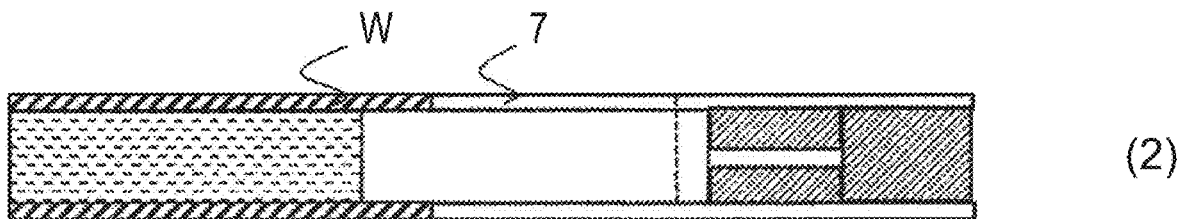
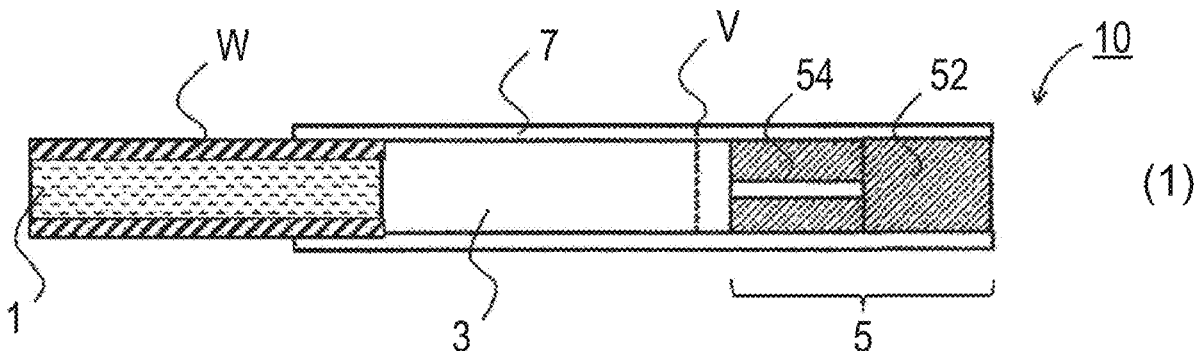


Fig. 1

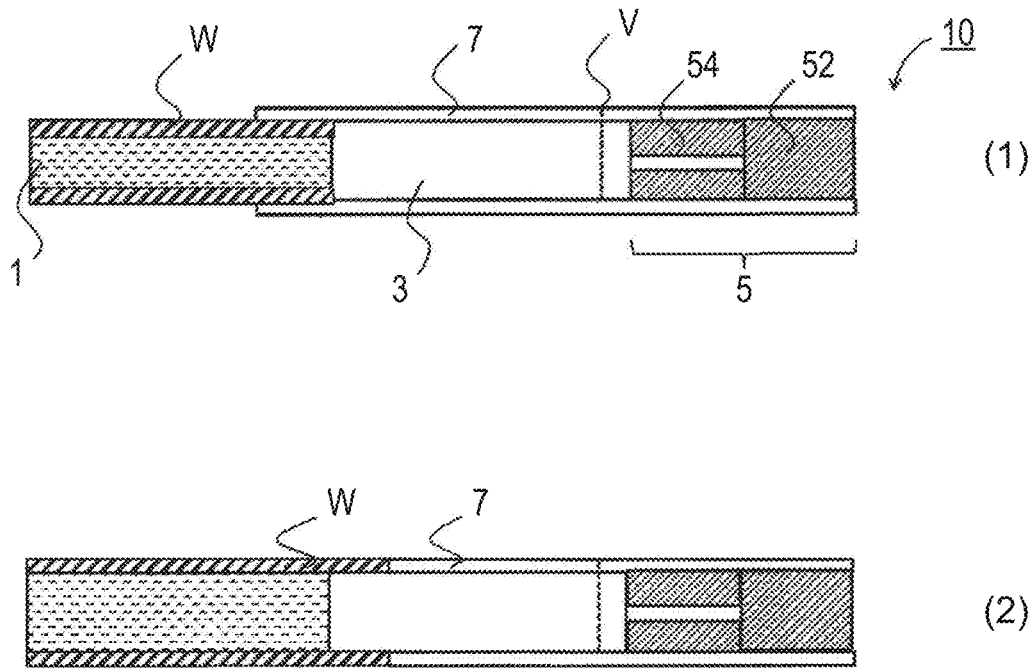


Fig. 2

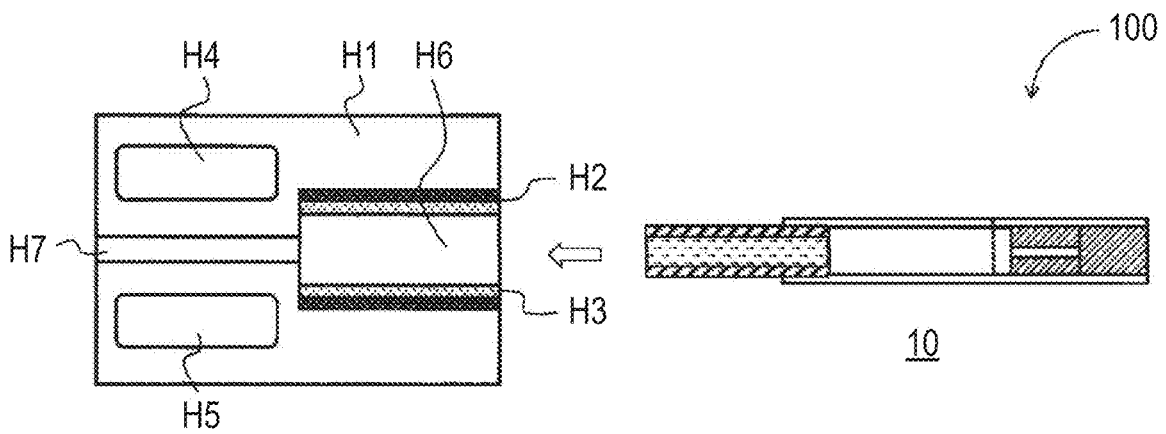
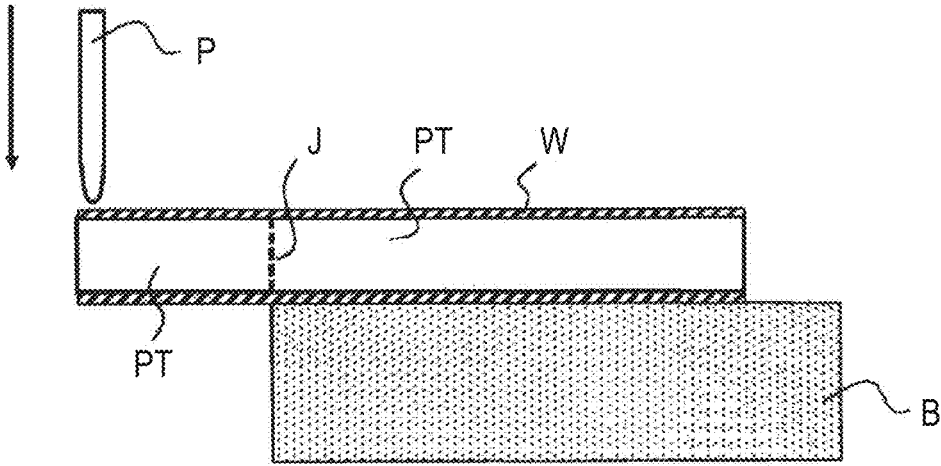


Fig. 3



**WRAPPER FOR  
NON-COMBUSTION-HEATED FLAVOR  
INHALATION ARTICLE**

CROSS-REFERENCE TO RELATED  
APPLICATION

**[0001]** This application is a continuation of International Application No. PCT/JP2022/027204 filed on Jul. 11, 2022, the entire content of which is incorporated herein by reference.

TECHNICAL FIELD

**[0002]** The present invention relates to a wrapper for a non-combustion heating type flavor inhalation article.

BACKGROUND ART

**[0003]** A wrapper constituted of paper is used for a flavor inhalation article. Conventionally, paper with various functions imparted have been proposed. For example, PTL 1 discloses paper for reducing visible sidestream smoke of a combustion type tobacco, and in particular, discloses paper containing a filling material of 12.6 to 17.4 wt % and having a grammage of 30 to 38.2 g/m<sup>2</sup> (example). Also, paper for reducing the occurrence of stains in non-combustion heating type smoking articles have also been proposed. For example, PTL 2 discloses paper containing a filler of 23 to 50 wt % and having a grammage of 23 to 45 g/m<sup>2</sup>, and PTL 3 discloses paper containing a filler of 26 to 32 wt % and having a grammage of 25 to 40 g/m<sup>2</sup>.

CITATION LIST

Patent Literature

- [0004]** PTL 1: Japanese Patent No. 2876070  
**[0005]** PTL 2: International Publication No. 2020/008510  
**[0006]** PTL 3: International Publication No. 2016/088204

SUMMARY OF INVENTION

Technical Problem

**[0007]** A non-combustion heating type flavor inhalation article generates an aerosol when a tobacco rod is heated. At this time, a wrapping paper or a tipping paper of the tobacco rod is deteriorated by heating. As a result, the non-combustion heating type flavor inhalation article is torn or broken, and the handleability is impaired in some cases. In view of such circumstances, an object of the present invention is to provide a non-combustion heating type flavor inhalation article that is excellent in handleability after heating.

Solution to Problem

**[0008]** The inventors have found that a wrapper containing a specific amount of a filler and including a base paper having a specific grammage solves the above-described problem.

Aspect 1

**[0009]** A wrapper for a non-combustion heating type flavor inhalation article includes a base paper having a grammage of 40 g/m<sup>2</sup> or more and containing a filler of 10 wt % or less.

Aspect 2

**[0010]** In the wrapper according to aspect 1, a tensile strength in an MD direction is 40 N/15 mm or more.

Aspect 3

**[0011]** In the wrapper according to aspect 1 or 2, a tensile strength in a CD direction is 20 N/15 mm or more.

Aspect 4

**[0012]** In the wrapper according to any one of aspects 1 to 3, the wrapper has a thickness of 45 μm or more.

Aspect 5

**[0013]** In the wrapper according to any one of aspects 1 to 4, the wrapper is a wrapping paper or a tipping paper.

Aspect 6

**[0014]** A non-combustion heating type flavor inhalation article includes the wrapper according to any one of aspects 1 to 5.

Aspect 7

**[0015]** The non-combustion heating type flavor inhalation article according to aspect 6 includes the wrapper according to any one of aspects 1 to 5 in a portion to be inserted into a heating device.

Aspect 8

**[0016]** In the non-combustion heating type flavor inhalation article according to aspect 7, the portion to be inserted into the heating device includes a portion or an entirety of a tobacco rod, or a joint portion between a tobacco rod and a member adjacent to the tobacco rod.

Advantageous Effects of Invention

**[0017]** The present invention can provide a non-combustion heating type flavor inhalation article that is excellent in handleability after heating.

BRIEF DESCRIPTION OF DRAWINGS

**[0018]** FIG. 1 is a diagram illustrating an aspect of a non-combustion type flavor inhalation article.

**[0019]** FIG. 2 is a diagram illustrating an aspect of a non-combustion type flavor inhalation system.

**[0020]** FIG. 3 is a diagram illustrating an outline of a breaking test.

DESCRIPTION OF EMBODIMENTS

**[0021]** The present invention will be described in detail below. In the present invention, “X to Y” includes X and Y that are end values thereof.

1. Wrapper

(1) Base Paper

**[0022]** A wrapper according to the present aspect includes a specific base paper. The base paper is a substrate containing pulp and does not contain a coating layer. The base paper has a grammage of 40 g/m<sup>2</sup> or more and contains a filler of 10 wt % or less. The filler is an inorganic filling material

added to the base paper to impart smoothness, brightness, opacity, and the like to the paper. Examples of the filler include, but not limited to, calcium carbonate, talc, and clay. Among these, calcium carbonate is preferable from the viewpoint of availability and the like.

**[0023]** When the grammage of the base paper is within the above-described range, the strength of the wrapper is improved. However, when the grammage of the base paper is within this range, the wrapper becomes fragile if the content of the filler is excessive. The inventors have found that the toughness of the wrapper can be increased by setting the filler content of the base paper to 10 wt % or less. From such a viewpoint, the lower limit of the grammage of the base paper is preferably 42 g/m<sup>2</sup> or more, more preferably 43 g/m<sup>2</sup> or more, and further preferably 45 g/m<sup>2</sup> or more. The upper limit of the grammage is not limited, but is preferably 60 g/m<sup>2</sup> or less, and more preferably 50 g/m<sup>2</sup> or less. The upper limit of the filler content is preferably 7 wt % or less. The lower limit of the filler content is not limited, but is preferably 2 wt % or more.

**[0024]** The base paper may contain a combustion retardant such as aluminum hydroxide. The amount of the combustion retardant may be a known amount, but is preferably about 1 to 10 g/m<sup>2</sup>.

## (2) Coating Layer

**[0025]** A known clear coating layer or pigment coating layer may be provided on the base paper. As the pigment in the pigment coating layer, one known in the papermaking field can be used. Examples thereof include calcium carbonate, titania, clay, talc, and the like. The coating amount per one side is preferably 3 g/m<sup>2</sup> or more, more preferably 4 g/m<sup>2</sup> or more, and further preferably 5 g/m<sup>2</sup> or more. The upper limit of the coating amount is not limited, but is preferably 10 g/m<sup>2</sup> or less.

**[0026]** The content of the pigment in the coating layer is not limited, but the lower limit thereof is preferably 5 wt % or more. The upper limit thereof is preferably 50 wt % or less. The coating layer contains a known binder and the like in addition to the pigment.

## (3) Characteristics of Wrapper

### 1) Grammage

**[0027]** The grammage of the wrapper is not limited as long as it is 40 g/m<sup>2</sup> or more, but is preferably 45 g/m<sup>2</sup> or more, and more preferably 50 g/m<sup>2</sup> or more. The upper limit of the grammage of the wrapper is not limited, but is preferably 80 g/m<sup>2</sup> or less. The grammage is measured in conformity with JIS P 8124.

### 2) Ash Content

**[0028]** The ash content is the amount of ash residue (wt %) relative to the oven-dried weight of the sample, and is an index of the total amount of the filler and the pigment in the pigment coating layer. The ash content of the wrapper is not limited, but the lower limit thereof is preferably 1 wt % or more, and more preferably 3 wt % or more. The upper limit thereof is preferably 10 wt % or less, and more preferably 7 wt % or less. The ash content is measured in conformity with JIS P 8252.

### 3) Tensile Strength

**[0029]** The tensile strength in an MD direction of the wrapper is preferably 40 N/15 mm or more, more preferably 50 N/15 mm or more, and further preferably 55 N/15 mm or more. Also, the tensile strength in a CD direction of the wrapper is preferably 20 N/15 mm or more, and more preferably 25 N/15 mm or more. The tensile strength is measured in conformity with JIS P 8113.

### 4) Thickness

**[0030]** The thickness of the wrapper is not limited, but is preferably 45 μm or more, and more preferably 50 μm or more, from the viewpoint of strength. The upper limit of the thickness of the wrapper is not limited, but can be, for example, 70 μm or less. The thickness is measured in conformity with JIS P 8118.

### 5) Use

**[0031]** The wrapper is useful as a wrapping paper or a tipping paper. The wrapping paper is a paper directly wrapped around the filler. The tipping paper is a paper that is wrapped around and joins a plurality of members. In particular, the wrapper is preferably a wrapping paper or a tipping paper that is wrapped around a member of a portion of a non-combustion heating type flavor inhalation article to be heated by a heater. Specifically, the wrapper is preferably a wrapping paper of a tobacco rod or a tipping paper for joining the tobacco rod to another member. Examples of the other member include a support member, a cooling member, and a mouthpiece.

## 2. Non-Combustion Heating Type Flavor Inhalation Article

**[0032]** FIG. 1 illustrates an aspect of a non-combustion type flavor inhalation article. In the figure, reference sign 10 denotes a non-combustion type flavor inhalation article, reference sign 1 denotes a tobacco rod, reference sign W denotes a wrapper, reference sign 3 denotes an adjacent member (preferably a cooling member) adjacent to the tobacco rod, reference sign 5 denotes a mouthpiece, reference sign 52 denotes a filter, reference sign 54 denotes a center hole filter, reference sign 7 denotes a tipping paper, and reference sign V denotes a ventilation. The aspect illustrated in FIG. 1 is also referred to as a non-combustion direct heating type flavor inhalation article because the tobacco material is heated. FIG. 1(1) illustrates an aspect in which the wrapper W is a wrapping paper of the tobacco rod 1, and FIG. 1(2) illustrates an aspect in which the wrapper W is a tipping paper that is wrapped around the tobacco rod 1 and the adjacent member 3.

### (1) Tobacco Rod

**[0033]** The tobacco rod is a member having a substantially circular pillar shape for generating an inhaling flavor component contained in a tobacco material. The tobacco rod includes a tobacco material and a wrapping paper (wrapper) wrapped around the tobacco material. The shape of the tobacco material to be filled in the wrapping paper is not limited, and examples thereof include a sheet, a cut sheet obtained by cutting the sheet to have a width of 0.8 to 1.2 mm, and a cut piece cut to have a width of 0.8 to 1.2 mm. The sheet may be gathered, folded, or spirally formed without being cut, and filled in a wrapping paper to obtain

a tobacco rod. Alternatively, the sheet may be cut into strips, and these strips may be filled into a wrapping paper in a concentric manner or in such a manner that the longitudinal direction of the strips is parallel to the longitudinal direction of the tobacco rod to obtain a tobacco rod.

**[0034]** The filling density of the tobacco material is not particularly limited, but is usually  $250 \text{ mg/cm}^3$  or more, and preferably  $320 \text{ mg/cm}^3$  or more, from the viewpoint of securing the characteristics of the non-combustion type flavor inhalation article and imparting a good smoke taste. Also, the upper limit thereof is usually  $800 \text{ mg/cm}^3$  or less, and preferably  $600 \text{ mg/cm}^3$  or less. The length of the tobacco rod **1** is not limited, but is preferably 15 to 25 mm. The diameter thereof is not limited, but is preferably 6 to 8 mm.

**[0035]** The tobacco material may generate vapor upon heating. The heating temperature is not limited, but is about  $250^\circ \text{C}$ . to  $350^\circ \text{C}$ . To promote generation of an aerosol, an aerosol source such as a polyol, e.g., glycerine, propylene glycol, 1,3-butanediol, etc., may be added to the tobacco material. The amount of the aerosol source to be added is preferably 5 to 50 wt %, and more preferably 10 to 30 wt %, relative to the dry weight of the tobacco material. In addition, a known flavoring agent and the like may be added to the tobacco material.

## (2) Adjacent Member

**[0036]** The adjacent member **3** is a member adjacent to the downstream side of the tobacco rod **1**. The downstream refers to the direction toward the mouthpiece end. Examples of the adjacent member include a cooling member for cooling the aerosol, a support member for increasing the strength of the entire article, and a mouthpiece (described later). The adjacent member **3** is preferably a cooling member.

**[0037]** The cooling member is a member for promoting aerosolization, for example, by cooling the inhaling flavor component and vapor generated in the tobacco rod **1**. The cooling member may be a hollow paper tube. The paper tube is preferably constituted of a cardboard having a higher rigidity than the rigidity of the wrapping paper or the tipping paper. The paper tube may be provided with a ventilation **V** (perforation). Preferably, a plurality of ventilations are provided along the circumference of the paper tube. Also, the cooling member may be filled with a gathered sheet for increasing the heat exchange efficiency. The dimensions of the cooling member are not limited, but the length is preferably 15 to 25 mm, and the diameter is preferably 5.5 to 7.5 mm.

## (3) Mouthpiece

**[0038]** The mouthpiece is a member constituting the mouthpiece end. In an aspect, the mouthpiece **5** includes the

filter **52** and the center hole filter **54**. As the filter **52** and the center hole filter **54**, known filters can be used.

## 2. Non-Combustion Heating Type Flavor Inhalation System

**[0039]** The combination of the non-combustion heating type flavor inhalation article and a heating device is also referred to as a non-combustion heating type flavor inhalation system. FIG. 2 illustrates an aspect of the system. In the figure, reference sign **100** denotes a non-combustion type flavor inhalation system, reference sign **10** denotes a non-combustion type flavor inhaler, and reference sign **30** denotes a heating device including a heater. The heating device includes the heater, a housing, a power source, and the like.

**[0040]** The heating device **30** includes a body **H1**, a heater **H2**, a metal tube **H3**, a battery unit **H4**, and a control unit **H5**. The body **H1** has a cylindrical recessed portion **H6**, and the heater **H2** and the metal tube **H3** are disposed at positions corresponding to the tobacco rod **1** inserted into the recessed portion **H6**. The heater **H2** can be a heater using electric resistance, and the heater **H2** performs heating with electric power being supplied from the battery unit **H4** in response to an instruction from the control unit **H5** that performs temperature control. The heat generated from the heater **H2** is transferred to the tobacco rod **1** through the metal tube **H3** having high thermal conductivity. Although the aspect in which the heating device **30** heats the tobacco rod **1** from the outside has been illustrated in the figure, the heating device **30** may heat the tobacco rod **1** from the inside. The heating temperature by the heating device **30** is not particularly limited, but is preferably  $400^\circ \text{C}$ . or less, more preferably  $150^\circ \text{C}$ . to  $400^\circ \text{C}$ ., and further preferably  $200^\circ \text{C}$ . to  $350^\circ \text{C}$ . The heating temperature indicates the temperature of the heater of the heating device **30**.

**[0041]** The portion of the non-combustion heating type flavor inhalation article to be inserted into the heating device **30** preferably includes a portion or the entirety of the tobacco rod **1** or a joint portion between the tobacco rod **1** and the adjacent member **3**. In this case, the non-combustion heating type flavor inhalation article preferably includes the wrapper **W** according to the present aspect in the portion to be inserted into the heating device **30**.

## EXAMPLES

Examples 1 to 3, Comparative Examples 1 to 6

**[0042]** The wrappers presented in Table 1 were prepared. Calcium carbonate and kaolin clay were used as fillers, and aluminum hydroxide was used as a pigment.

TABLE 1

	Examples			Comparative examples					
	1	2	3	1	2	3	4	5	6
Wrapper	W1	W2	W3	U1	U2	U3	T1	T2	T3
Wrapper grammage $\text{g/m}^2$	45.8	50.0	51.7	44.3	50.4	50.5	36.4	43.0	43.6
Base paper grammage $\text{g/m}^2$	45.8	42.9	45.0	44.3	43.5	43.7	36.4	35.6	36.6

TABLE 1-continued

	Examples			Comparative examples					
	1	2	3	1	2	3	4	5	6
Filler wt %	6	6	6	28	28	28	25	25	25
Coating amount g/m <sup>2</sup>	0	4.2	5.9	0	6.1	6.2	0	6.4	7.0
Pigment in coating layer wt %	0	0	4.0	0	0	4.0	0	0	4.1
Wrapper thickness um	56	55	59	51	54	57	43	47	49
Air permeability CU	2.5	1.2	0.8	0.6	0.1	0.3	0.7	1.0	0.7
Tensile strength MD N/15 mm	58.2	62.6	59.5	43.1	43.6	42.7	34.5	35.1	36.8
Stretch MD %	1.98	2.2	2.0	1.8	1.9	1.8	1.7	1.9	1.9
Tensile strength CD N/15 mm	28.5	33.0	32.4	22.5	22.7	20.7	18.7	17.3	18.2
Stretch CD %	5.0	5.2	5.3	4.5	4.3	4.4	4.3	5.4	5.0
Diffusion coefficient cm/s	0.083	0.001	0.011	0.054	0.001	0.022	0.114	0.005	0.029
Opacity (non- coating surface) %	66.6	60.9	66.3	83.6	83.5	83.2	79.1	78.1	79.9
Brightness (non- coating surface) %	87.6	84.8	86.5	88.4	88.2	88.4	90.3	88.2	89.4
Al(OH) <sub>3</sub> amount to be added g/m <sup>2</sup>	0	0	4.0	0	0	4.0	0	0	4.1
Load at break N	3.81	3.87	4.03	3.54	2.95	3.30	2.86	2.18	2.05

[0043] Each test was performed in conformity with the following.

[0044] Grammage: JIS P 8124

[0045] Thickness: JIS P 8118

[0046] Tensile strength and stretch: JIS P 8113

[0047] Air permeability: CORESTA RECOMMENDED METHOD No. 40

[0048] Opacity: JIS P 8149

[0049] Brightness: JIS P 8148

[0050] Diffusion coefficient: CORESTA RECOMMENDED METHOD No. 77

[0051] A paper tube having a length of 15 mm and a paper tube having a length of 45 mm were prepared, and both were disposed so that end faces were in contact with each other. Each of the wrappers presented in Table 1 was wrapped around the region containing the joint portion, and the two paper tubes were joined to prepare a test piece. The test piece was inserted into the heating device illustrated in FIG. 2, and the test piece was heated at 295° C. for 5 minutes. At this time, the joint portion was heated.

[0052] The heated test piece was cooled to room temperature and subjected to a breaking test. The outline of the test is illustrated in FIG. 3. In the figure, reference sign P denotes a plunger, reference sign B denotes a base, and reference sign J denotes a joint portion. The load and the like at break are presented in Table 1. In this test, the characteristics of the wrapper could be accurately evaluated because the characteristics were not affected by the strength of the paper tubes. As a result, it was clear that the wrappers of the examples were superior to the wrappers of the comparative examples in strength after heating.

[0053] The test piece is a model of the non-combustion heating type flavor inhalation article illustrated in FIG. 1.

Thus, when a non-combustion heating type flavor inhalation article including the wrapper is produced and tested, similar results are obtained.

#### REFERENCE SIGNS LIST

- [0054] 1 tobacco rod
- [0055] 3 adjacent member, cooling member
- [0056] 5 mouthpiece
- [0057] 52 filter
- [0058] 54 center hole filter
- [0059] 7 tipping paper
- [0060] V ventilation
- [0061] W wrapper
- [0062] 10 non-combustion type flavor inhalation article
- [0063] 30 heating device
- [0064] 100 non-combustion type flavor inhalation system
- [0065] H1 body
- [0066] H2 heater
- [0067] H3 metal tube
- [0068] H4 battery unit
- [0069] H5 control unit
- [0070] H6 recessed portion
- [0071] H7 vent hole
- [0072] P plunger
- [0073] B base
- [0074] J joint portion
- [0075] PT paper tube

1. A wrapper for a non-combustion heating type flavor inhalation article comprising a base paper having a grammage of 40 g/m<sup>2</sup> or more and containing a filler of 10 wt % or less.

2. The wrapper according to claim 1, wherein a tensile strength in an MD direction is 40 N/15 mm or more.

3. The wrapper according to claim 1, wherein a tensile strength in a CD direction is 20 N/15 mm or more.

4. The wrapper according to claim 1, wherein the wrapper has a thickness of 45  $\mu\text{m}$  or more.

5. The wrapper according to claim 1, wherein the wrapper is a wrapping paper or a tipping paper.

6. A non-combustion heating type flavor inhalation article comprising the wrapper according to claim 1.

7. The non-combustion heating type flavor inhalation article according to claim 6 comprising a wrapper in a portion to be inserted into a heating device, the wrapper comprising a base paper having a grammage of 40  $\text{g}/\text{m}^2$  or more and containing a filler of 10 wt % or less.

8. The non-combustion heating type flavor inhalation article according to claim 7, wherein the portion to be inserted into the heating device includes a portion or an entirety of a tobacco rod, or a joint portion between a tobacco rod and a member adjacent to the tobacco rod.

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