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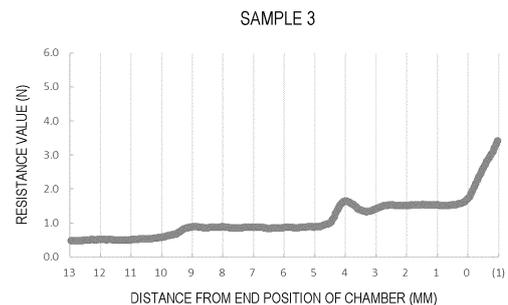
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(54) **SMOKING SYSTEM, DEVICE KIT, CONSUMABLE, COMBINED ARTICLE, AND METHOD FOR OBTAINING SENSATION OF REACHING TERMINAL END AND PREDICTIVE SENSATION OF REACHING TERMINAL END**

(57) To obtain a smoking system that provides easiness to feel reaching at an end of a chamber and easiness to expect reaching at the end of the chamber when a flavor generating article is inserted into the chamber. When a resistance value when the flavor generating article is inserted into an accommodating portion and a distal end of the flavor generating article reaches an end of the accommodating portion is defined as an insertion force A, and a ratio of a second half portion average resistance that is an average of resistance values from a middle point between a predetermined position of the accommodating portion on a side of an insertion end and an end of the accommodating portion to the end of the accommodating portion with respect to a first half portion average resistance that is an average of resistance values from the predetermined position to the middle point between the predetermined position and the end of the accommodating portion in a case where the flavor generating article is inserted into the accommodating portion is defined as a first resistance ratio B,  $A \leq 4.00 \text{ N}$  and  $B > 1.0$  are satisfied.

Fig. 16



**Description**

TECHNICAL FIELD

5 **[0001]** The present invention relates to a smoking system, a device kit, a consumable article, a combination article, and a method for obtaining a sense of end reaching and a sense of expectation of end reaching.

BACKGROUND ART

10 **[0002]** Conventionally, flavor inhalers for inhaling flavors or the like without burning materials are known. As such a flavor inhaler, a flavor inhaler including a holding portion that holds an inserted flavor generating article corresponding to an opening of a chamber, for example, is known (see PTL 1, for example).

CITATION LIST

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PATENT LITERATURE

**[0003]** PTL 1: Japanese Patent No. 6737902

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SUMMARY OF INVENTION

TECHNICAL PROBLEM

25 **[0004]** PTL 1 discloses a structure of holding a flavor generating article inserted into a chamber. However, there are no devices that provide easiness to feel reaching of the flavor generating article at an end of the chamber and easiness to expect reaching thereof at the end of the chamber when the flavor generating article is inserted into the chamber. In other words, there may be a case where the flavor generating article is excessively strongly pushed in and it leads to deformation of the flavor generating article since it is difficult to feel the reaching thereof at the end of the chamber and to expect reaching thereof at the end of the chamber.

30 **[0005]** Also, if the flavor generating article is not disposed at an appropriate position relative to a heating portion of the flavor inhaler, there may be a case where the flavor generating article (especially, a filling portion filled with a smokable material) is insufficiently heated and it adversely affects the taste. Therefore, it is important to easily feel reaching at the end of the chamber and to easily expect reaching at the end of the chamber in order for the flavor generating article to be able to be disposed at a proper position in the chamber.

35 **[0006]** The present invention was made in order to solve at least a part of the problem as described above, and an object thereof is to obtain a smoking system that provides easiness to feel reaching at an end of a chamber and easiness to expect reaching at the end of the chamber when a flavor generating article is inserted into the chamber.

SOLUTION TO PROBLEM

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**[0007]** According to a first aspect of the present invention, there is provided a smoking system. The smoking system includes: a flavor inhaler; and a flavor generating article, in which the flavor inhaler includes an accommodating portion that has an opening formed at one end and accommodates at least a part of the flavor generating article via the opening, and when a resistance value when the flavor generating article is inserted into the accommodating portion and a distal end of the flavor generating article reaches an end of the accommodating portion is defined as an insertion force A, and a ratio of a second half portion average resistance that is an average of resistance values from a middle point between a predetermined position of the accommodating portion on a side of an insertion end and the end of the accommodating portion to the end of the accommodating portion with respect to a first half portion average resistance that is an average of resistance values from the predetermined position to the middle point between the predetermined position and the end of the accommodating portion in a case where the flavor generating article is inserted into the accommodating portion is defined as a first resistance ratio B, Expression (1) and Expression (2) below are satisfied.

50

$$A \leq 4.00 \text{ N} \dots (1)$$

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$$B > 1.0 \dots (2)$$

**[0008]** According to the first aspect of the present invention, it is possible to feel that the flavor generating article has reached the end of the accommodating portion when the flavor generating article is inserted into the accommodating portion by Expression (1) being satisfied, and it becomes easy to expect that the flavor generating article will reach the end of the accommodating portion since a sense of an increase in insertion resistance on the side closer to the end of the accommodating portion helps sensing of an approach to the end by Expression (2) being satisfied.

**[0009]** In the first aspect of the present invention, the predetermined position of the accommodating portion on the side of the insertion end may be a position at 10 mm from the end of the accommodating portion. Also, the middle point between the predetermined position and the end of the accommodating portion may be a position at 5 mm from the end of the accommodating portion. In this case, the first half portion average resistance may be an average of resistance values in a position range of 10 mm to 5 mm from the end of the accommodating portion, and the second half portion average resistance may be an average of resistance values in a position range of 5 mm to 0 mm from the end of the accommodating portion.

**[0010]** In a second aspect of the present invention, at least one local variation region in which a resistance value varies by a predetermined amount or more within a predetermined range in a case where the flavor generating article is inserted into the accommodating portion is provided, in the first aspect.

**[0011]** According to the second aspect of the present invention, it becomes easy for a user to sense approach to the end of the accommodating portion, and it becomes easier for the user to expect reaching at the end of the accommodating portion, by providing the local variation in resistance value.

**[0012]** In a third aspect of the present invention, when a ratio between the resistance value in the local variation region and the insertion force is defined as a second resistance ratio C, Expression (3) below is satisfied, in the second aspect.

$$C \geq 0.8 \dots (3)$$

**[0013]** According to the third aspect of the present invention, it is possible to prevent a significantly small resistance value in the local variation region as compared with the insertion force from not being able to contribute to expectation of reaching at the end of the accommodating portion by Expression (3) being satisfied.

**[0014]** In a fourth aspect of the present invention, when a distance between an end position of the accommodating portion and the local variation region is defined as a distance D, Expression (4) below is satisfied, in the second aspect or the third aspect.

$$D \leq 5.0 \text{ mm} \dots (4)$$

**[0015]** According to the fourth aspect of the present invention, it is possible for the user to maintain a feeling of passing through the local variation region until reaching at the end of the accommodating portion and thereby to further easily expect reaching at the end of the accommodating portion by Expression (4) being satisfied.

**[0016]** In a fifth aspect of the present invention, the smoking system further includes a heating portion that heats the flavor generating article accommodated in the accommodating portion, and the heating portion is provided at the flavor inhaler and does not have a heating element to be inserted into the flavor generating article, in any of the first aspect to the fourth aspect.

**[0017]** According to the fifth aspect of the present invention, it becomes easy to feel reaching at the end of the accommodating portion and to expect reaching at the end of the accommodating portion in a flavor inhaler with the heating portion disposed at an outer periphery of the accommodating portion, for example. Also, in a case where the heating portion provided at the flavor inhaler is inserted into the flavor generating article, there may be a case where adhesion of the flavor generating article and aggregates of aerosol smoke or the like generated from the flavor generating article to the heating portion, which happens with utilization, affect a sense of insertion of the flavor generating article. On the other hand, according to the fifth aspect of the present invention, adhesion of the aggregates and the like to the heating portion does not occur in the flavor inhaler with the heating portion disposed at the outer periphery of the accommodating portion, for example, and it is thus possible to prevent the sense of insertion of the flavor generating article from changing with utilization.

**[0018]** In a sixth aspect of the present invention, the flavor generating article includes a filling portion that is filled with a smokable material, a hollow tubular portion that is provided continuously with the filling portion, and a filter portion that is provided continuously with the tubular portion, the accommodating portion includes a holding portion that holds the flavor generating article accommodated in the accommodating portion, and the holding portion is provided at a position at which the holding portion is able to come into contact with at least two parts of the flavor generating article in a case where the flavor generating article is inserted into the accommodating portion, in any of the first aspect to the fifth aspect.

**[0019]** According to the sixth aspect of the present invention, it is possible to stably hold the flavor generating article

at a position near the insertion end of the accommodating portion by coming into contact with at least two parts of the flavor generating article in a case where the flavor generating article is inserted into the accommodating portion.

**[0020]** In a seventh aspect of the present invention, the accommodating portion includes a contact portion that pressurizes a part of the accommodated flavor generating article in an axial direction of the accommodating portion, and a separated portion that is separated from the accommodated flavor generating article, in any of the first aspect to the sixth aspect.

**[0021]** According to the seventh aspect of the present invention, it is possible to compress and keep the inserted flavor generating article by pressurizing a part of the flavor generating article accommodated in the accommodating portion in the axial direction of the accommodating portion with the contact portion.

**[0022]** In an eighth aspect of the present invention, there is provided a device kit. The device kit includes: the flavor inhaler according to any one of the first aspect to the seventh aspect; and a display that indicates that the device kit is used for the flavor generating article according to any one of the first aspect to the seventh aspect.

**[0023]** According to the eighth aspect of the present invention, it becomes easy to feel reaching at the end of the accommodating portion and to expect reaching at the end of the accommodating portion in a case where the flavor generating article used for the flavor inhaler is applied to the flavor inhaler included in the device kit.

**[0024]** In a ninth aspect of the present invention, there is provided a consumable article. The consumable article includes: the flavor generating article according to any one of the first aspect to the seventh aspect; and a display that indicates that the consumable article is used for the flavor inhaler according to any one of the first aspect to the seventh aspect.

**[0025]** According to the ninth aspect of the present invention, it becomes easy to feel reaching at the end of the accommodating portion and to expect reaching at the end of the accommodating portion in a case where the flavor inhaler used for the flavor generating article is applied to the flavor generating article included in the consumable article.

**[0026]** In a tenth aspect of the present invention, there is provided a combination article of a consumable article and a device kit. The combination article includes: a consumable article that includes the flavor generating article according to any of the first aspect to the sixth aspect; and a device kit that includes the flavor inhaler according to any of the first aspect to the sixth aspect, in which at least one of the consumable article and the device kit includes a display that indicates that the at least one is used for the other one of the consumable article and the device kit.

**[0027]** According to the tenth aspect of the present invention, it becomes easy to feel reaching at the end of the accommodating portion and to expect reaching at the end of the accommodating portion in the combination article of the device kit and the consumable article that is a dedicated article for the device kit.

**[0028]** In an eleventh aspect of the present invention, there is provided a method for obtaining a sense of end reaching and a sense of expectation of end reaching in a smoking system including a flavor inhaler and a flavor generating article. In this method, the flavor inhaler includes an accommodating portion that has an opening formed at one end and accommodates at least a part of the flavor generating article via the opening, and when a resistance value when the flavor generating article is inserted into the accommodating portion and a distal end of the flavor generating article reaches an end of the accommodating portion is defined as an insertion force A, and a ratio of a second half portion average resistance that is an average of resistance values from a middle point between a predetermined position of the accommodating portion on a side of an insertion end and the end of the accommodating portion to the end of the accommodating portion with respect to a first half portion average resistance that is an average of resistance values from the predetermined position to the middle point between the predetermined position and the end of the accommodating portion in a case where the flavor generating article is inserted into the accommodating portion is defined as a first resistance ratio B, Expression (1) and Expression (2) below are satisfied.

$$A \leq 4.00 \text{ N} \dots (1)$$

$$B > 1.0 \dots (2)$$

**[0029]** According to the eleventh aspect of the present invention, it is possible to feel that the flavor generating article has reached the end of the accommodating portion when the flavor generating article is inserted into the accommodating portion by Expression (1) being satisfied, and it becomes easy to expect that the flavor generating article will reach the end of the accommodating portion since a sense of an increase in insertion resistance on the side closer to the end of the accommodating portion helps sensing of an approach to the end by Expression (2) being satisfied.

**[0030]** In the eleventh aspect of the present invention, the predetermined position of the accommodating portion on the side of the insertion end may be a position at 10 mm from the end of the accommodating portion. Also, the middle point between the predetermined position and the end of the accommodating portion may be a position at 5 mm from the end of the accommodating portion. In this case, the first half portion average resistance may be an average of

resistance values in a position range of 10 mm to 5 mm from the end of the accommodating portion, and the second half portion average resistance may be an average of resistance values in a position range of 5 mm to 0 mm from the end of the accommodating portion.

## 5 BRIEF DESCRIPTION OF DRAWINGS

### [0031]

Fig. 1A is a schematic front view of a flavor inhaler according to a present embodiment.  
 10 Fig. 1B is a schematic top view of the flavor inhaler according to the present embodiment.  
 Fig. 1C is a schematic bottom view of the flavor inhaler according to the present embodiment.  
 Fig. 2 is a schematic side sectional view of a flavor generating article.  
 Fig. 3 is a sectional view of the flavor inhaler along the arrow 3-3 illustrated in Fig. 1B.  
 Fig. 4A is a perspective view of a chamber according to a present embodiment.  
 15 Fig. 4B is a sectional view of the chamber along the arrow 4B-4B illustrated in Fig. 4A.  
 Fig. 5A is a sectional view of the chamber along the arrow 5A-5A illustrated in Fig. 4B.  
 Fig. 5B is a sectional view of the chamber along the arrow 5B-5B illustrated in Fig. 4B.  
 Fig. 6 is a perspective view of the chamber and the heating portion according to the present embodiment.  
 Fig. 7 is a sectional view illustrated in Fig. 5B in a state where the flavor generating article is disposed at a desired  
 20 position in the chamber according to the present embodiment.  
 Fig. 8 is a sectional view illustrating a chamber according to a first example of the present embodiment.  
 Fig. 9 is a sectional view of the chamber illustrated in Fig. 8.  
 Fig. 10 is a sectional view illustrating a chamber according to the first example of the present embodiment.  
 Fig. 11 is a sectional view of the chamber illustrated in Fig. 10.  
 25 Fig. 12 is a sectional view illustrating a chamber according to the first example of the present embodiment.  
 Fig. 13 is a sectional view of the chamber illustrated in Fig. 12.  
 Fig. 14 is a graph illustrating a relationship between a distance from an end position of a chamber and a resistance  
 value in Sample 1.  
 Fig. 15 is a graph illustrating a relationship between a distance from an end position of a chamber and a resistance  
 30 value in Sample 2.  
 Fig. 16 is a graph illustrating a relationship between a distance from an end position of a chamber and a resistance  
 value in Sample 3.  
 Fig. 17 is a graph illustrating a relationship between a distance from an end position of a chamber and a resistance  
 value in Sample 4.  
 35 Fig. 18 is a graph illustrating a relationship between a distance from an end position of a chamber and a resistance  
 value in Sample 5.  
 Fig. 19 is a graph illustrating a relationship between a distance from an end position of a chamber and a resistance  
 value in Sample 6.

## 40 DESCRIPTION OF EMBODIMENTS

[0032] Hereinafter, embodiments of the present invention will be described with reference to the drawings. In the drawings described below, the same reference signs will be applied to the same or corresponding components, and repeated description will be omitted.

45 [Basic configuration]

[0033] First, a basic configuration of a flavor inhaler according to the present embodiment will be described. Fig. 1A is a schematic front view of a flavor inhaler 100 according to a present embodiment. Fig. 1B is a schematic top view of the flavor inhaler 100 according to the present embodiment. Fig. 1C is a schematic bottom view of the flavor inhaler 100 according to the present embodiment. In the drawings described in the specification, an X-Y-Z orthogonal coordinate system may be added for convenience of description. In the coordinate system, the Z axis is directed vertically upward, the X-Y plane is disposed to cut the flavor inhaler 100 in the horizontal direction, and the Y axis is disposed to extend from the front surface to the rear surface of the flavor inhaler 100. The Z axis can also be called an insertion direction of a flavor generating article to be accommodated in a chamber 50 of an atomization portion 30, which will be described later, or an axial direction of the chamber 50. Additionally, the X axis is in a direction that perpendicularly intersects the Y axis and the Z axis.

[0034] The flavor inhaler 100 according to the present embodiment is configured to generate an aerosol containing a

flavor by heating a flavor generating article of a stick type having a flavor source containing an aerosol source, for example.

**[0035]** As illustrated in Figs. 1A to 1C, the flavor inhaler 100 has an outer housing 101, a slide cover 102, a switch portion 103, and a terminal 104. The outer housing 101 configures the outermost housing of the flavor inhaler 100 and has a size with which it fits in a user's hand. The user can hold the flavor inhaler 100 with his/her hand and inhale the aerosol when the user uses the flavor inhaler 100. The outer housing 101 may be configured by assembling a plurality of members. The outer housing 101 may be formed of metal such as aluminum. Note that the outer housing 101 may have a member made of a resin, for example, polycarbonate (PC), an acrylonitrile-butadiene-styrene (ABS) resin, or a polymer alloy or the like containing polyether ether ketone (PEEK) or a plurality of types of polymers.

**[0036]** The outer housing 101 has an opening, which is not illustrated, for receiving the flavor generating article, and the slide cover 102 is slidably attached to the outer housing 101 to close the opening. Specifically, the slide cover 102 is configured to be movable along an outer surface of the outer housing 101 between a closed position (the position illustrated in Figs. 1A and 1B) at which the opening of the outer housing 101 is closed and an open position at which the opening is open. It is possible to cause the slide cover 102 to move between the closed position and the open position by the user manually operating the slide cover 102, for example. In this manner, the slide cover 102 is able to permit or restrict access to the flavor generating article inside the flavor inhaler 100.

**[0037]** The switch portion 103 is used to switch ON and OFF of an operation of the flavor inhaler 100. For example, power is supplied from a power source, which is not illustrated, to a heating portion, which is not illustrated, and it is possible to heat the flavor generating article without burning the flavor generating article, by the user operating the switch portion 103 in a state where the flavor generating article is inserted into the flavor inhaler 100. Note that the switch portion 103 may be a switch provided outside the outer housing 101 or may be a switch located inside the outer housing 101. In a case where the switch is located inside the outer housing 101, the switch is indirectly pressed by pressing the switch portion 103 on the surface of the outer housing 101. In the present embodiment, an example in which the switch of the switch portion 103 is located inside the outer housing 101 will be described.

**[0038]** The terminal 104 is an interface, such as a USB, that connects the flavor inhaler 100 to an external power source, for example. In a case where the power source included in the flavor inhaler 100 is a chargeable battery, the external power source can cause a current to flow to the power source and charge the power source by connecting the external power source to the terminal 104. Also, the flavor inhaler 100 may be configured to be able to transmit data related to the operation of the flavor inhaler 100 to an external device by connecting a data transmission cable to the terminal 104.

**[0039]** Next, the flavor generating article used by the flavor inhaler 100 according to the present embodiment will be described. Fig. 2 is a schematic side sectional view of the flavor generating article 110. In the present embodiment, the flavor inhaler 100 and the flavor generating article 110 can configure a smoking system. In the example illustrated in Fig. 2, the flavor generating article 110 may have a filling portion 111 that is filled with a smokable material and a filter segment including a filter portion 115 and a hollow filter portion 116. The hollow filter portion 116 can be located on a side closer to the smokable material than the filter portion 115. Specifically, the flavor generating article 110 may be a rod-shaped heat-not-burn tobacco including a smokable material, a mouthpiece portion, and a second wrapping paper, such as a tipping paper, that wraps them. The mouthpiece portion includes a tubular member 114 and a filter segment. The filter segment includes a hollow filter portion 116 and a filter portion 115. The tubular member 114 that is a cooling segment may be adjacent to and sandwiched between the smokable material and the filter segment in the axial direction (also referred to as a "long axis direction") of the flavor generating article 110. Also, the tubular member 114 may be provided with an opening V concentrically in the circumferential direction of the tubular member 114. The opening V provided in the tubular member 114 of the flavor generating article 110 is typically a hole for promoting air to flow in from the outside through inhalation of the user, and flowing-in of the air can lower the temperature of components and air flowing in from the smokable material.

**[0040]** The rod-shaped flavor generating article 110 preferably has a columnar shape that satisfies a shape in which an aspect ratio defined as follows is equal to or greater than one.

$$\text{Aspect ratio} = h/w$$

w is a width of the bottom surface of the columnar body (in the present specification, defined as a width of the bottom surface on the side of the smokable material), h is a height, and  $h \geq w$  is preferably satisfied. In the present specification, the long axis direction is defined as a direction represented by h. Therefore, the direction represented by h will be referred to as the long axis direction even in a case where  $w \geq h$  for convenience. The shape of the bottom surface is not limited and may be a polygon, a rounded polygon, a circle, an oval, or the like, and the width w is a diameter in a case where the bottom surface has a circular shape, is a longer diameter in a case of an oval, or is a diameter of a circumscribed circle or a longer diameter of a circumscribed oval in a case of a polygon or a rounded polygon.

**[0041]** The flavor generating article 110 may have a first wrapping paper 112 that wraps the smokable material. The

length of the flavor generating article 110 in the longitudinal direction is preferably 40 mm to 90 mm, is more preferably 50 to 75 mm, and is further preferably 50 mm to 60 mm. More specifically, the length h of the flavor generating article 110 in the long axis direction is not particularly limited, is typically equal to or greater than 40 mm, is preferably equal to or greater than 45 mm, and is further preferably equal to or greater than 50 mm, for example. Also, the length h of the flavor generating article 110 in the long axis direction is typically equal to or less than 100 mm, is preferably equal to or less than 90 mm, and is further preferably equal to or less than 80 mm. The inner circumference of the flavor generating article 110 is preferably 15 mm to 25 mm, is more preferably 17 mm to 24 mm, and is further preferably 20 mm to 23 mm. More specifically, the width w of the bottom surface of the columnar body of the flavor generating article 110 is not particularly limited, is typically equal to or greater than 5 mm, and is preferably equal to or greater than 5.5 mm, for example. Also, the width w of the bottom surface of the columnar body of the flavor generating article 110 is typically equal to or less than 10 mm, is preferably equal to or less than 9 mm, and is more preferably equal to or less than 8 mm. Additionally, the length of the smokable material in the flavor generating article 110 may be 18 mm to 22 mm, the length of the first wrapping paper 112 may be 18 mm to 22 mm, the length of the hollow filter portion 116 may be 7 mm to 9 mm, and the length of the filter portion 115 may be 6 mm to 8 mm.

**[0042]** Although a proportion of the length of the tubular member 114 and the filter segment in the length of the flavor generating article 110 in the long axis direction (the tubular member 114 : the filter segment) is not particularly limited, the proportion is typically 0.60 to 1.40 : 0.60 to 1.40, is preferably 0.80 to 1.20 : 0.80 to 1.20, is more preferably 0.85 to 1.15 : 0.85 to 1.15, is further preferably 0.90 to 1.10 : 0.90 to 1.10, and is particularly preferably 0.95 to 1.05 : 0.95 to 1.05, from the viewpoint of the delivery amount of flavoring and the appropriate temperature of aerosol. It is possible to realize satisfactory flavor and the strength of flavor by achieving a balance among a cooling effect, an effect of curbing a loss caused by adhesion of generated vapor and aerosol to the inner wall of the tubular member 114, and a function of adjusting the amount of air and flavor of a filter by causing the proportions between the length of the tubular member 114 and the length of the filter segment to fall within the above range. Particularly, although particle formation of aerosol and the like is promoted and satisfactory flavor can be realized if the length of the tubular member 14 is extended, an excessively long length may lead to adhesion of the passing substance to the inner wall.

**[0043]** The configuration of the mouthpiece portion is not particularly limited as long as the tubular member 114 is configured to be adjacent to and sandwiched between the smokable material and the filter segment in the axial direction of the flavor generating article 110. In other words, the flavor generating article 110 can have the tubular member 114 between the smokable material and the filter segment. Hereinafter, the filter segment and the tubular member 114 will be described in detail.

(Disclosure regarding filter segment)

**[0044]** The filter segment is not particularly limited as long as the filter segment includes the filter portion 115 and functions as a typical filter. Although examples of the typical functions of the filter include adjustment of the amount of air mixed when aerosol and the like are inhaled, reduction of flavor, and reduction of nicotine and tar, it is not necessary to include all of these functions. Also, in an electrically heated tobacco with a trend that the amount of generated components is smaller and the filling rate of the tobacco filler is lower as compared with a paper wrapped tobacco product, preventing dropping of the tobacco filler while curbing a filtering function is also one of important functions.

(Disclosure regarding dimension)

**[0045]** Although the sectional shape of the filter segment in the circumferential direction is substantially a circular shape, and the diameter of the circle can be appropriately changed in accordance with the size of the product, the diameter is typically equal to or greater than 4.0 mm and equal to or less than 9.0 mm, is preferably equal to or greater than 4.5 mm and equal to or less than 8.5 mm, and is more preferably equal to or greater than 5.0 mm and equal to or less than 8.0 mm. Note that in a case where the section does not have a circular shape, a diameter of a circle on the assumption of the same area as the area of the section is applied as the above diameter. Although the length of the circumference of the sectional shape of the filter segment in the circumferential direction can be appropriately changed in accordance with the size of the product, the length is typically equal to or greater than 140 mm and equal to or less than 27.0 mm, is preferably equal to or greater than 15.0 mm and equal to or less than 26.0 mm, and is more preferably equal to or greater than 16.0 mm and equal to or less than 25.0 mm. Although the length of the filter segment in the axial direction can be appropriately changed in accordance with the size of the product, the length is typically equal to or greater than 15 mm and equal to or less than 35 mm, is preferably equal to or greater than 17.5 mm and equal to or less than 32.5 mm, and is more preferably equal to or greater than 20.0 mm and equal to or less than 30.0 mm. It is possible to appropriately adjust the shape and the dimension of the filter portion 115 such that the shape and the dimension of the filter segment fall within the above range.

(Disclosure regarding filter portion 115)

5 **[0046]** As the filter portion 115 configuring the filter segment, a filter portion manufactured by a manufacturing method, which will be described later, or a commercially available product, for example, may be used. Also, aspects of the filter  
10 segment are not particularly limited, and it is possible to employ a plain filter including a single filter segment, a multi-segment filter including a plurality of filter segments, such as dual filters or triple filters, or the like. The filter segment can be manufactured by a known method, and in a case where synthesized fiber such as cellulose acetate tow is used as a material of the filter portion 115, for example, it is possible to manufacture the filter segment by a method of performing fiber spinning with a polymer solution containing a polymer and a solvent and crimping it. As the method, it is possible to use the method described in International Publication No. WO 2013/067511, for example. In the manufacturing of the filter segment, it is possible to appropriately design adjustment of a ventilation resistance or addition of additives (such as a known adsorbent or a flavoring (menthol, for example), a granular activated carbon, and a flavoring keeping material) to the filter portion 115. Aspects of the filter portion 115 configuring the filter segment are not particularly limited, known aspects may be employed, and it is possible to exemplify a filter portion obtained by working cellulose acetate tow into a columnar shape, for example. Although the single-yarn fineness and the total fineness of the cellulose acetate tow are not particularly limited, the single-yarn fineness is preferably equal to or greater than 5 g/9000 m and equal to or less than 12 g/9000 m, and the total fineness is preferably equal to or greater than 12000 g/9000 m and equal to or less than 35000 g/9000 m in a case of a mouthpiece with a circumference of 22 mm. Examples of the sectional shape of the fiber of the cellulose acetate tow includes a circular shape, an oval shape, a Y shape, an I shape, and an R shape. In the case of the filter portion 115 filled with the cellulose acetate tow, equal to or greater than 5% by weight and equal to or less than 10% by weight of triacetin (plasticizer) may be added with respect to the weight of the cellulose acetate tow in order to enhance filter hardness. Also, an aspect in which a paper filter filled with a sheet-shaped pulp paper is used instead of the acetate filter may be employed.

25 (Disclosure regarding hollow filter portion 116)

**[0047]** The filter segment may include a hollow filter portion 116 that has one or multiple hollow portions. The hollow filter portion 116 is typically disposed on the side closer to the tubular member 114 than the filter portion 115 and is preferably disposed to be adjacent to the tubular member 114.

30 **[0048]** The hollow filter portion 116 is configured of a filling layer that has one or multiple hollow portions and an inner plug wrapper (inner wrapping paper) that covers the filling layer. The hollow portions can be provided at arbitrary positions of the hollow filter portion 116. The hollow filter portion 116 has a function of enhancing the strength of the mouthpiece portion. The filling layer can be a rod that is filled with cellulose acetate fiber at a high density, for example, and is obtained by adding equal to or greater than 6% by mass and equal to or less than 20% by mass of plasticizer containing triacetin with respect to the mass of cellulose acetate and hardening them. The inner diameter of the hollow filter portion 116 can be equal to or greater than  $\phi$  1.0 mm and equal to or less than 5.0 mm. Since the filling density of the fiber is high in the filling layer, air and aerosol flow only in the hollow portions, and substantially no air and aerosol flow inside the filling layer during inhalation. Since the filling layer inside the hollow filter portion 116 is a fiber filling layer, a touch feeling from the outside during use does not often make the user feel uncomfortable. Note that the hollow filter portion 116 may not have the inner plug wrapper, and the shape thereof may be kept by heat forming. The hardness of the hollow filter portion 116 is preferably higher than the hardness of the filter portion 115. Specifically, the mass percentage of the plasticizer contained in the hollow filter portion 116 is preferably higher than the mass percentage of the plasticizer contained in the filter portion 115. When it is desired to reduce a decrease in aerosol component due to filtration at the filter portion 115 in the flavor generating article 110, shortening the length of the filter portion 115 and replacing it with the hollow filter portion 116 is effective to increase the delivery amount of aerosol.

(Disclosure regarding filter density)

50 **[0049]** Although the density of the filter portion 115 is not particularly limited, the density is typically equal to or greater than 0.10 g/cm<sup>3</sup> and equal to or less than 0.25 g/cm<sup>3</sup>, is preferably equal to or greater than 0.11 g/cm<sup>3</sup> and equal to or less than 0.24 g/cm<sup>3</sup>, and is more preferably equal to or greater than 0.12 g/cm<sup>3</sup> and equal to or less than 0.23 g/cm<sup>3</sup>.

(Disclosure regarding filter wrapper (inner and outer wrapping papers))

55 **[0050]** The filter segment may include a wrapping paper (filter plug wrapping paper) for wrapping the aforementioned filter portion 115 and the like from the viewpoint of an improvement in strength and structural rigidity. Aspects of the wrapping paper are not particularly limited, and one or more seams containing an adhesive may be included. The adhesive may contain a hot-melt adhesive, and the hot-melt adhesive can contain polyvinyl alcohol. Also, in a case

where the filter segment includes two or more segments, the wrapping paper preferably wraps these two or more segments together. The material of the wrapping paper is not particularly limited, a known material can be used, and the wrapping paper may contain a filler such as calcium carbonate and the like. The thickness of the wrapping paper is not particularly limited, is typically equal to or greater than 20  $\mu\text{m}$  and equal to or less than 140  $\mu\text{m}$ , is preferably equal to or greater than 30  $\mu\text{m}$  and equal to or less than 130  $\mu\text{m}$ , and is more preferably equal to or greater than 30  $\mu\text{m}$  and equal to or less than 120  $\mu\text{m}$ . The basis weight of the wrapping paper is not particularly limited, is typically equal to or greater than 20 gsm and equal to or less than 100 gsm, is more preferably equal to or greater than 22 gsm and equal to or less than 95 gsm, and is more preferably equal to or greater than 23 gsm and equal to or less than 90 gsm. Also, although the wrapping paper may or may not be coated, the wrapping paper is preferably coated with a desired material from the viewpoint that it is possible to apply functions other than the strength and the structural rigidity.

**[0051]** The hollow filter portion 116 and the filter portion 115 may be connected with an outer plug wrapper (outer wrapping paper), for example. The outer plug wrapper can be a cylindrical paper, for example. Also, the smokable material, the tubular member 114, and the hollow filter portion 116 and the filter portion 115 connected to each other may be connected with a mouthpiece lining paper (second wrapping paper 113), for example. For the connection, it is possible to achieve the connection by applying a glue such as a vinyl acetate-based glue to the inner surface of the mouthpiece lining paper, for example, and wrapping it with the smokable material, the tubular member 114, and the connected hollow filter portion 116 and the filter portion 115 put therein. Note that the connection may be achieved in a manner split into a plurality of times by using a plurality of lining papers.

(Disclosure regarding addition of activated carbon)

**[0052]** Activated carbon may be added to at least a part of the filter portion 115. The amount of added activated carbon is equal to or greater than 15.0  $\text{m}^2/\text{cm}^2$  and equal to or less than 80.0  $\text{m}^2/\text{cm}^2$  as a value of the specific surface area of the activated carbon  $\times$  the weight of the activated carbon / a sectional area in the direction perpendicular to the ventilation direction of the filter portion 115 in one flavor generating article 110. "The specific surface area of the activated carbon  $\times$  the weight of the activated carbon / a sectional area in the direction perpendicular to the ventilation direction of the filter portion 115" described above may be expressed as a "surface area of the activated carbon per unit sectional area" for convenience. The surface area of the activated carbon per unit sectional area can be calculated on the basis of the specific surface area of the activated carbon to be added to the filter portion 115 that one flavor generating article 110 has, the weight of the added activated carbon, and the sectional area of the filter portion 115. Note that the activated carbon may not be uniformly dispersed in the filter portion 115 to which it is added, and satisfying the above range in the entire section of the filter portion 115 (the section in the direction perpendicular to the ventilation direction) is not required. It is possible to deliver a desired amount of component generated by heating to the user and to provide a desired flavor feeling to the user by the surface area of the activated carbon per unit sectional area falling within the above range. If the surface area of the activated carbon per unit sectional area is less than the lower limit of the above range, it is not possible to sufficiently obtain the effect of adding the activated carbon. On the other hand, if the surface area of the activated carbon per unit sectional area is greater than the upper limit of the above range, an unnecessarily large amount of component generated by heating reduces.

**[0053]** The surface area of the activated carbon per unit sectional area is more preferably equal to or greater than 17.0  $\text{m}^2/\text{cm}^2$  and is further preferably equal to or greater than 35.0  $\text{m}^2/\text{cm}^2$ . On the other hand, the surface area is more preferably equal to or less than 77.0  $\text{m}^2/\text{cm}^2$  and is further preferably equal to or less than 73.0  $\text{m}^2/\text{cm}^2$ . The surface area of the activated carbon per unit sectional area can be adjusted by adjusting the specific surface area of the activated carbon, the amount of addition thereof, and the sectional area of the filter portion 115 in the direction perpendicular to the ventilation direction, for example. For the above calculation of the surface area of the activated carbon per unit sectional area, the calculation is performed on the basis of the filter portion 115 with the activated carbon added thereto. In a case where the filter segment is configured of a plurality of filter portions 115, the sectional area and the length of only the filter portions 115 to which the activated carbon has been added are used as references.

**[0054]** Examples of the activated carbon that can be used in the present aspect include activated carbon using wood, bamboo, coconut shells, walnut shells, and coal, for example, as raw materials. Also, as the activated carbon that can be used in the present aspect, it is possible to use activated carbon with a BET specific surface area of equal to or greater than 1100  $\text{m}^2/\text{g}$  and equal to or less than 1600  $\text{m}^2/\text{g}$ , preferably of equal to or greater than 1200  $\text{m}^2/\text{g}$  and equal to or less than 1500  $\text{m}^2/\text{g}$ , or even more preferably of equal to or greater than 1250  $\text{m}^2/\text{g}$  and equal to or less than 1380  $\text{m}^2/\text{g}$ . The BET specific surface area can be obtained by a nitrogen gas adsorption method (BET multi-point method). Also, as the activated carbon that can be used in the present embodiment, it is possible to use activated carbon with a micropore volume of equal to or greater than 400  $\mu\text{L}/\text{g}$  and equal to or less than 800  $\mu\text{L}/\text{g}$ , more preferably of equal to or greater than 500  $\mu\text{L}/\text{g}$  and equal to or less than 750  $\mu\text{L}/\text{g}$ , and further preferably of equal to or greater than 600  $\mu\text{L}/\text{g}$  and equal to or less than 700  $\mu\text{L}/\text{g}$ . The micropore volume can be calculated from the maximum amount of adsorption obtained by using the nitrogen gas adsorption method.

**[0055]** In the present aspect, the amount of added activated carbon per unit length of the filter portion 115 with the activated carbon added thereto in the ventilation direction is preferably equal to or greater than 5 mg/cm and equal to or less than 50 mg/cm, is more preferably equal to or greater than 8 mg/cm and equal to or less than 40 mg/cm, and is further preferably equal to or greater than 10 mg/cm and equal to or less than 35 mg/cm. In the present aspect, it is possible to adjust the surface area of the activated carbon per unit sectional area to a desired surface area by the specific surface area of the activated carbon and the amount of added activated carbon falling within the above ranges. Also, as the activated carbon that can be used in the present aspect, the volume cumulative particle diameter at the cumulative volume of 10% (particle diameter D10) of the activated carbon particles is preferably equal to or greater than 250  $\mu\text{m}$  and equal to or less than 1200  $\mu\text{m}$ . Also, the volume cumulative particle diameter at the cumulative volume of 50% (particle diameter D50) of the activated carbon particles is preferably equal to or greater than 350  $\mu\text{m}$  and equal to or less than 1500  $\mu\text{m}$ . Note that D10 and D50 are measured by a laser diffractive scattering method. Examples of a device suitable for the measurement include a laser diffraction scattering particle diameter distribution measurement device "LA-950" manufactured by Horiba Ltd. Powder is poured along with pure water into a cell of the device, and a particle diameter is detected on the basis of light scattering information of the particles. Measurement conditions of the device are as follows.

Measurement mode: Manual flow mode type cell measurement

Dispersion medium: Ion exchanged water

Dispersion method: Measured after irradiation with ultrasonic waves for 1 minute

Refractive index: 1.92 to 0.00i (ample refraction)/1.33 to 0.00i (dispersion medium refractive index)

Number of times of measurement: Measured twice with sample changed

**[0056]** In the present aspect, the method of adding activated carbon to the filter portion 115 is not particularly limited, and it is only necessary to add it such that the activated carbon is substantially uniformly dispersed in the filter portion 115 as a target of addition of the activated carbon. Note that a filter segment manufactured by a known manufacturing method, for example, may be used, and a commercially available product may be used. Also, aspects of the filter segment are not particularly limited, and it is possible to employ a filter including a single filter segment, a multi-segment filter including a plurality of filter segments, such as dual filters or triple filters, or the like. In a case of the single filter segment, the filter portion 115 to which the activated carbon is added directly serves as the filter segment. On the other hand, in a case where a multiple filter segments are included, the filter portion 115 to which the activated carbon is added is preferably disposed on the side further upstream than the filter portion 115 configuring a mouthpiece end. On the other hand, the activated carbon may be added to the filter portion 115 configuring the mouthpiece end. Note that in a case of a multi-segment filter is employed in regard to the filter segment, the length of the filter segment that is a basis of the amount of added activated carbon is the length of the filter portion 115 to which the activated carbon is added. The amount of added activated carbon is, for example, equal to or greater than 4.0 mg and equal to or less than 24.0 mg, is preferably equal to or greater than 4.5 mg and equal to or less than 23.0 mg, and is further preferably equal to or greater than 10.5 mg and equal to or less than 22.0, as the weight with respect to the entire filter segments.

(Disclosure regarding tubular member 114)

**[0057]** The tubular member 114 can be adjacent to and sandwiched between the smokable material and the filter segment. The tubular member 114 typically includes a rod-shaped or tubular member having a hollow (hollowed-out part) section in the circumferential direction of the cylinder or the like and provided with the cavity.

(Disclosure regarding dimension of tubular member 114)

**[0058]** The length of the tubular member 114 in the long axis direction can be appropriately changed in accordance with the size of the product, is typically equal to or greater than 15 mm, is preferably equal to or greater than 20 mm, is more preferably equal to or greater than 25 mm, and also is typically equal to or less than 40 mm, is preferably equal to or less than 35 mm, and is more preferably equal to or less than 30 mm. It is possible to secure a sufficient cooling effect and to obtain satisfactory flavor by setting the length of the tubular member 114 in the long axis direction to be equal to or greater than the lower limit, and it is possible to curb a loss due generated vapor and aerosol adhering the inner wall of the tubular member 114 by setting the length to be equal to or less than the upper limit.

**[0059]** The tubular member 114 may be filled with a sheet or the like for cooling. The entire surface area of the tubular member 114 is not particularly limited and is, for example, equal to or greater than 300  $\text{mm}^2/\text{mm}$  and equal to or less than 1000  $\text{mm}^2/\text{mm}$ . The surface area is a surface area per length (mm) of the tubular member 114 in the ventilation direction. The entire surface area of the tubular member 114 is preferably equal to or greater than 400  $\text{mm}^2/\text{mm}$ , is more preferably equal to or greater than 450  $\text{mm}^2/\text{mm}$ , and on the other hand, is preferably equal to or less than 600  $\text{mm}^2/\text{mm}$ ,

and is more preferably equal to or less than  $550 \text{ mm}^2/\text{mm}$ . It is desirable that the tubular member 114 have the entire surface area with a large inner structure. Therefore, in a preferred aspect, the tubular member 114 may include a sheet of a thin material to which wrinkles are applied to form channels and pleats, gathering, and folding are then applied. As the folding or the gathering per volume applied to the element increases, the total surface area of the tubular member 114 increases. The thickness of the constituent material of the tubular member 114 is not particularly limited and may be equal to or greater than  $5 \text{ }\mu\text{m}$  and equal to or less than  $500 \text{ }\mu\text{m}$  or may be equal to or greater than  $10 \text{ }\mu\text{m}$  and equal to or less than  $250 \text{ }\mu\text{m}$ , for example.

(Disclosure regarding smokable material)

**[0060]** Aspects of the smokable material is not particularly limited as long as the aspects are known, and an aspect in which a tobacco filling material is wrapped with a wrapping paper (first wrapping paper 112) is typically employed. The tobacco filling material is not particularly limited, and it is possible to use a first tobacco filling material or a second tobacco filling material, which will be described later. Also, a molded article of a dried tobacco such as a tobacco shred, a tobacco sheet, or tobacco granules, which will be described later, may be simply referred to as "dried tobacco leaves" in the specification of the present applicant. Also, the smokable material may have a portion fitted to a heater member or the like for heating the tobacco product.

(Disclosure regarding dimension of smokable material)

**[0061]** The smokable material obtained by wrapping the tobacco filling material with a wrapping paper preferably has a columnar shape, and in this case, the aspect ratio represented by the height of the smokable material in the long axis direction with respect to the width of the bottom surface of the smokable material is preferably equal to or greater than 1. The shape of the bottom surface is not particularly limited and may be a polygon, a rounded polygon, a circle, an oval, or the like, and the width is a diameter in a case where the bottom surface has a circular shape, is a longer diameter in a case of an oval shape, and is a diameter of a circumscribed circle or a longer diameter of a circumscribed oval in a case of a polygonal shape or a rounded polygonal shape. The height of the tobacco filling material configuring the smokable material is preferably about 10 mm to 70 mm, and the width is preferably about 4 mm to 9 mm.

**[0062]** Although the length of the smokable material in the long axis direction can be appropriately changed in accordance with the size of the product, the length is typically equal to or greater than 10 mm, is preferably equal to or greater than 12 mm, is more preferably equal to or greater than 15 mm, is further preferably equal to or greater than 18 mm, and is typically equal to or less than 70 mm, is preferably equal to or less than 50 mm, is more preferably equal to or less than 30 mm, and is further preferably equal to or less than 25 mm. Also, although the proportion of the length of the smokable material with respect to the entire length  $h$  of the flavor generating article 110 in the long axis direction is not particularly limited, the proportion is typically equal to or greater than 10%, is preferably equal to or greater than 20%, is more preferably equal to or greater than 25%, is further preferably equal to or greater than 30%, and is typically equal to or less than 80%, is preferably equal to or less than 70%, is more preferably equal to or less than 60%, is further preferably equal to or less than 50%, and is particularly preferably equal to or less than 45%, and is most preferably equal to or less than 40%, from the viewpoint of a balance between the amount of delivery and the aerosol temperature.

(Disclosure regarding amount of filling)

**[0063]** Although the content of dried tobacco leaves in the smokable material is not particularly limited, examples thereof include the content of equal to or greater than 200 mg/1 smokable material and equal to or less than 800 mg/1 smokable material, and the content is preferably equal to or greater than 250 mg/1 smokable material and equal to or less than 600 mg/1 smokable material. This range is suitable for a smokable material with a circumference of 22 mm and a length of 20 mm, in particular.

(Disclosure regarding filling material (first tobacco filling material: shred filling))

**[0064]** First, a first tobacco filling material (also simply referred to as a "first filling material") will be described. The material of the tobacco shredding (flavor source) included in the first filling material is not particularly limited, and it is possible to use tobacco such as laminas or leaf veins or other known plants. Also, the shape of the flavor source such as tobacco may be a shredded shape, a sheet shape, a string shape, a powder shape, a particle shape, a pellet shape, a slurry shape, a porous shape, or the like. Specifically, a flavor source obtained by grinding dried tobacco leaves to achieve an average particle diameter of equal to or greater than  $20 \text{ }\mu\text{m}$  and equal to or less than  $200 \text{ }\mu\text{m}$  thereby to obtain a tobacco ground article, working a material uniformly containing the tobacco ground article into a sheet (hereinafter, also simply referred to as a uniform sheet), and shredding the sheet may be used, for example. Furthermore, a

so-called strand type of filling the smokable material with a material obtained by shredding, substantially horizontally with respect to the longitudinal direction of the smokable material, a uniform sheet having a length similar to that of the smokable material in the longitudinal direction may also be employed. Moreover, a material obtained by applying gathering to the above material worked into a sheet without shredding it may be used as a smokable material. Also, the width of the tobacco shredding is preferably equal to or greater than 0.5 mm and equal to or less than 2.0 mm in order to fill the smokable material therewith. A content range of the smokable material such as tobacco in the flavor generating article 110 is 200 mg to 400 mg, for example, and is preferably 250 mg to 320 mg in a case where the smokable material has a circumference of 20 mm to 23 mm and a length of 18 mm to 22 mm as a size thereof.

**[0065]** As for the tobacco leaves used for producing the above tobacco shredding and the uniform sheet, it is possible to use various kinds of tobacco. Examples thereof include a flue-cured species, Burley species, Orient species, native species, other *Nicotiana tabacum* breeds, *Nicotiana rustica* breeds, and mixtures thereof. As a mixture, it is possible to appropriately blend and use the above breeds to achieve a target taste. Details of the above tobacco breeds are disclosed in "Encyclopedia of Tobacco, Tobacco Academic Studies Center, March 31, 2009". There are multiple conventional methods as methods for manufacturing the above uniform sheet, that is, methods for grinding tobacco leaves and working them into a uniform sheet. A first method is a method of producing a mixed sheet by using a paper mixing process. A second method is a method of mixing an appropriate solvent such as water with ground tobacco leaves, uniformizing them, casting the uniform substance on a metal plate or a metal plate belt in a thin thickness, drying it, and thereby producing a cast sheet. A third method is a method of mixing an appropriate solvent such as water with ground tobacco leaves, uniformizing them, extrusion-molding the uniform substance into a sheet shape, and thereby producing a rolled sheet. The types of the above uniform sheet are disclosed in detail in "Encyclopedia of Tobacco, Tobacco Academic Studies Center, March 31, 2009".

**[0066]** The water content of the tobacco filling material can be equal to or greater than 8% by weight and equal to or less than 18% by weight, is preferably 10% by weight to 16% by weight, is more preferably equal to or greater than 10% by weight and equal to or less than 15% by weight, and is further preferably equal to or greater than 11% by weight and equal to or less than 13% by weight with respect to the total amount of tobacco filling material. With such water content, occurrence of wrapping stain is curbed, and satisfactory wrapping-up properties are achieved at the time of manufacturing of the smokable material. Also, the flavor generating article 110 is likely to be moderately deformed in accordance with the sectional shape of the hold portion. The size of the tobacco shredding contained in the first tobacco filling material and a method for preparing it are not particularly limited. For example, dried tobacco leaves shredded into a width of equal to or greater than 0.5 mm and equal to or less than 2.0 mm may be used, or dried tobacco leaves shredded into a width of equal to or greater than 0.8 mm and equal to or less than 1.2 mm can be preferably used. Also, in a case where a ground substance of the uniform sheet is used, a ground substance obtained by grinding and uniformizing dried tobacco leaves to achieve an average particle diameter of about 20  $\mu\text{m}$  to 200  $\mu\text{m}$ , working them into a sheet, and shredding it to have a width of equal to or greater than 0.5 mm and equal to or less than 2.0 mm, preferably a width of equal to or greater than 0.8 mm and equal to or less than 1.2 mm may be used.

**[0067]** The first tobacco filling material may contain an aerosol base material generating aerosol smoke. The type of the aerosol base material is not particularly limited, and it is possible to select a substance extracted from various natural products and/or a constituent component thereof in accordance with an application. Examples of the aerosol base material include glycerin, propylene glycol, triacetin, 1,3-butanediol, and a mixture thereof. The content of the aerosol base material in the first tobacco filling material (% by weight with respect to the weight of the first tobacco filling material) is not particularly limited, is typically equal to or greater than 5% by weight, is preferably equal to or greater than 10% by weight, and also is typically equal to or less than 50% by weight, is preferably equal to or greater than 15% by weight and equal to or less than 25% by weight with respect to the entire amount of the tobacco filling material from the viewpoint of sufficiently generating aerosol and applying satisfactory flavor.

**[0068]** The first tobacco filling material may contain a flavoring. The type of the flavoring is not particularly limited and can be a flavoring similar to the aforementioned flavoring to be added to the filter portion 115 from the viewpoint of applying satisfactory flavor.

**[0069]** The content of the flavoring in the first tobacco filling material is not particularly limited, is typically equal to or greater than 10000 ppm, is preferably equal to or greater than 20000 ppm, is more preferably equal to or greater than 25000 ppm, and is also typically equal to or less than 70000 ppm, is preferably equal to or less than 50000 ppm, and is more preferably equal to or less than 40000 ppm, and is further preferably equal to or less than 33000 ppm, from the viewpoint of applying satisfactory flavor.

**[0070]** Although the filling density in the first tobacco filling material is not particularly limited, the filling density is typically equal to or greater than 250  $\text{mg}/\text{cm}^3$ , is more preferably equal to or greater than 300  $\text{mg}/\text{cm}^3$ , and is also typically equal to or less than 400  $\text{mg}/\text{cm}^3$ , and is more preferably equal to or less than 350  $\text{mg}/\text{cm}^3$  from the viewpoint of securing performance of the flavor generating article 110 and applying satisfactory flavor. The above first tobacco filling material is wrapped by a wrapping paper with the first tobacco filling material located inside thereby to form a smokable material.

(Disclosure regarding filling material (second tobacco filling material: sheet filling))

**[0071]** The second tobacco filling material is configured of a tobacco sheet with which a filling target is filled. The number of tobacco sheets may be one, two, or more. Examples of aspects in a case where the second tobacco filling material is configured of one tobacco sheet include a filling aspect (so-called a gathered sheet) in a state where a tobacco sheet with a side having a length similar to that of the filling target in the longitudinal direction is folded a plurality of times horizontally with respect to the longitudinal direction of the filling target. Also, an aspect of filling of a tobacco sheet having a side with a length similar to that of the filling target in the longitudinal direction in a state where the tobacco sheet is wound in a direction perpendicularly intersecting the longitudinal direction of the filling target is also exemplified.

**[0072]** Examples of an aspect in a case where the second tobacco filling material is configured of two or more tobacco sheets include an aspect of filling in a state where a plurality of tobacco sheets having a side with a length similar to that of the filling target in the longitudinal direction are wound in the direction perpendicularly intersecting the longitudinal direction of the filling target so as to be concentrically disposed. "Concentrically disposed" means that all the tobacco sheets are disposed with the centers thereof located at substantially the same position. Although the number of tobacco sheets is not particularly limited, aspects in which the number of tobacco sheets is two, three, four, five, six, and seven can be exemplified. The all the two or more tobacco sheets may have the same composition or physical properties, or some or all of the tobacco sheets may have different compositions or physical properties. Also, the thicknesses of the tobacco sheets may be the same or different from each other.

**[0073]** The second tobacco filling material can be manufactured by preparing a plurality of tobacco sheets with different widths, preparing a laminate therefrom with the widths decreasing from the bottom to the top, causing this to pass through a winding pipe, and subjecting this to winding molding. According to the manufacturing method, the plurality of tobacco sheets extend in the longitudinal direction and are disposed concentrically around the longitudinal direction axis. Also, a fitting portion extending in the longitudinal direction may be formed between the longitudinal direction axis and the tobacco sheet in the innermost layer.

**[0074]** In the manufacturing method, the laminate is preferably prepared such that a non-contact portion is formed between the adjacent tobacco sheets after the winding molding. If the non-contact portion (clearance) with which the tobacco sheets do not come into contact is present between the plurality of tobacco sheets, it is possible to secure a flavor flow path and to enhance delivery efficiency of the flavor component. On the other hand, it is possible to deliver the heat from the heater to the outer tobacco sheets via the contact part of the plurality of tobacco sheets and thereby to secure high heat transmission efficiency. It is possible to exemplify a method of preparing a laminate by using embossed tobacco sheets, laminating tobacco sheets without causing entire surfaces of adjacent tobacco sheets to adhere to each other, laminating tobacco sheets with a part of adjacent tobacco sheets caused to adhere to each other, or laminating tobacco sheets with the entire surfaces or parts of adjacent tobacco sheets caused to slightly adhere to each other such that they peel off after the winding molding, in order to provide the non-contact portion with which the tobacco sheets do not come into contact between the plurality of tobacco sheets. In a case where a smokable material including a wrapping paper is prepared, the wrapping paper may be disposed at the lowermost part of the laminate. Also, it is also possible to form the fitting portion by placing a tubular dummy such as a mandrel at the uppermost portion of the laminate, forming the second tobacco filling material, and then removing the dummy.

**[0075]** Although the filling density of the second tobacco filling material is not particularly limited, the filling density is typically equal to or greater than  $250 \text{ mg/cm}^3$  and is preferably equal to or greater than  $300 \text{ mg/cm}^3$ , and is also typically equal to or less than  $400 \text{ mg/cm}^3$  and is preferably equal to or less than  $350 \text{ mg/cm}^3$ , from the viewpoint of securing performance of the tobacco product and applying satisfactory flavor.

**[0076]** Each tobacco sheet may contain an aerosol base material that generates aerosol smoke with heating. As the aerosol base material, an aerosol source of glycerin, propylene glycol, or polyol such as 1,3-butanediol is added. The amount of addition of such an aerosol base material is preferably equal to or greater than 5% by weight and equal to or less than 50% by weight, and is more preferably equal to or greater than 15% by weight and equal to or less than 25% by weight with respect to the dry weight of the tobacco sheet.

**[0077]** The tobacco sheet can be appropriately manufactured by a known method such as mixing, a slurry, rolling or the like. Note that it is also possible to use the uniform sheet described above for the first tobacco filling material. In the case of mixing, the tobacco sheet can be manufactured by a method including the following processes.

- 1) Dried tobacco leaves are roughly ground and are extracted with water, and the mixture is separated into water extracts and residues.
- 2) The water extracts are dried under a reduced pressure and are thereby concentrated.
- 3) Pulp is added to the residues, and the mixture is formed into fibers with a refiner and is then mixed.
- 4) The concentrate of the water extracts is added to the mixed sheet and is dried, thereby obtaining a tobacco sheet.

**[0078]** In this case, a process of removing a part of components such as nitrosamine may be added (see Japanese

Translation of PCT International Application Publication No. 2004-510422). In the case of the slurry method, it is possible to manufacture the tobacco sheet by a method including the following processes.

- 1) Water, pulp, and a binder are mixed with ground tobacco leaves.
- 2) The mixture is extended to have a thin thickness (casted) and is then dried.

**[0079]** In this case, a process of removing a part of components such as nitrosamine by irradiating the slurry obtained by mixing water, pulp, the binder, and the ground tobacco leaves with ultraviolet rays or X-rays may be added.

**[0080]** In addition, it is also possible to use a tobacco sheet in a non-woven fabric form manufactured by a method including the following processes as described in International Publication No. WO 2014/104078.

- 1) Granular tobacco leaves and a binding agent are mixed.
- 2) The mixture is sandwiched by a nonwoven cloth.
- 3) The laminate is formed into a specific shape through heat welding, thereby obtaining a tobacco sheet in the non-woven fabric form. As the type of the tobacco leaves that are raw materials used in each of the above methods, the same tobacco leaves as those described for the first filling material can be used. Although the composition of the tobacco sheet is not particularly limited, the content of the tobacco raw materials (tobacco leaves) is preferably equal to or greater than 50% by weight and equal to or less than 95% by weight with respect to the total weight of the tobacco sheet, for example. Moreover, the tobacco sheet may contain a binder, and examples of such a binder include guar gum, xanthan gum, carboxymethyl cellulose (CMC), a sodium salt of carboxymethyl cellulose (CMC-Na), and the like. The amount of binder is preferably equal to or greater than 1% by weight and equal to or less than 10% by weight with respect to the total weight of the tobacco sheet. The tobacco sheet may further contain other additives. Examples of the additives include fillers such as pulp. Although a plurality of tobacco sheets are used in the present embodiment, all such tobacco sheets may have the same composition or physical properties, or some or all of the tobacco sheets may have different compositions or physical properties.

**[0081]** The second tobacco filling material can be manufactured by preparing a plurality of tobacco sheets with different widths, preparing a laminate therefrom with the widths decreasing from the bottom to the top, causing this to pass through a winding pipe, and subjecting this to winding molding. According to the manufacturing method, the plurality of tobacco sheets extend in the longitudinal direction and are disposed concentrically around the longitudinal direction axis. Also, a fitting portion extending in the longitudinal direction may be formed between the longitudinal direction axis and the tobacco sheet in the innermost layer. In the manufacturing method, the laminate is preferably prepared such that a non-contact portion is formed between the adjacent tobacco sheets after the winding molding. If the non-contact portion (clearance) with which the tobacco sheets do not come into contact is present between the plurality of tobacco sheets, it is possible to secure a flavor flow path and to enhance delivery efficiency of the flavor component. On the other hand, it is possible to deliver the heat from the heater to the outer tobacco sheets via the contact part of the plurality of tobacco sheets and thereby to secure high heat transmission efficiency in a case where the tobacco product is used for an electrically heated tobacco.

**[0082]** It is possible to exemplify a method of preparing a laminate by using embossed tobacco sheets, laminating tobacco sheets without causing entire surfaces of adjacent tobacco sheets to adhere to each other, laminating tobacco sheets with a part of adjacent tobacco sheets caused to adhere to each other, or laminating tobacco sheets with the entire surfaces or parts of adjacent tobacco sheets caused to slightly adhere to each other such that they peel off after the winding molding, in order to provide the non-contact portion with which the tobacco sheets do not come into contact between the plurality of tobacco sheets. In a case where a smokable material including a wrapping paper is prepared, the wrapping paper may be disposed at the lowermost part of the laminate. Also, it is also possible to form the fitting portion by placing a tubular dummy such as a mandrel at the uppermost portion of the laminate, forming the second tobacco filling material, and then removing the dummy. Although the thickness of each tobacco sheet is not limited, the thickness is preferably equal to or greater than 150  $\mu\text{m}$  and equal to or less than 1000  $\mu\text{m}$  and is more preferably equal to or greater than 200  $\mu\text{m}$  and equal to or less than 600  $\mu\text{m}$  in terms of a balance between the heat transmission efficiency and the strength. The thicknesses of the tobacco sheets may be the same or different from each other. Although the number of tobacco sheets configuring the second tobacco filling material is not particularly limited, it is possible to exemplify two, three, four, five, six, or seven.

(Disclosure regarding wrapping paper)

**[0083]** The flavor generating article 110 may have a second wrapping paper 113 that raps at least one of the tubular member 114, the hollow filter portion 116, and the filter portion 115 and is different from the first wrapping paper 112. The second wrapping paper 113 may wrap a part of the first wrapping paper 112 wrapping the smokable material. The

configuration of the wrapping paper (including the first wrapping paper 112 or the second wrapping paper 113 below) is not particularly limited, typical aspects may be used, and examples thereof include an aspect in which pulp is contained as a main component. As the pulp, pulp manufactured and obtained by mixing non-wooden pulp typically used for a wrapping paper for a tobacco product, such as flax pulp, cannabis pulp, sisal pulp, or esparto may be used as well as pulp produced by mixing wooden pulp such as softwood pulp and hardwood pulp. As types of the pulp, it is possible to use chemical pulp obtained by a kraft cooking method, an acidic/neutral/alkaline sulfite cooking method, a soda salt cooking method, or the like, ground pulp, chemiground pulp, thermomechanical pulp, or the like.

**[0084]** The texture is adjusted and uniformized during the sheet mixing process using the above pulp achieved by a Fourdrinier paper machine, a cylinder paper machine, a cylinder/short-Fourdrinier composite paper machine, or the like, thereby manufacturing the wrapping paper. Note that it is possible to apply water proofness to the wrapping paper by adding a wet paper strength enhancer or to adjust a print condition of the wrapping paper by adding a sizing agent, as needed. Moreover, it is possible to add aluminum sulfate, internal aids for paper mixing such as various kinds of anionic, cationic, nonionic, or amphoteric yield improver, drainage improver, and paper strength enhancer, and additives for paper production such as a dye, a pH adjuster, a defoamer, a pitch controlling agent, and a slime controlling agent.

**[0085]** The basis weight of the base paper for the wrapping paper is typically equal to or greater than 20 gsm and is preferably equal to or greater than 25 gsm, for example. On the other hand, the basis weight is typically equal to or less than 65 gsm, is preferably equal to or less than 50 gsm, and is further preferably equal to or less than 45 gsm. The thickness of the wrapping paper with the above properties is not particularly limited, is typically equal to or greater than 10  $\mu\text{m}$ , is preferably equal to or greater than 20  $\mu\text{m}$ , is more preferably equal to or greater than 30  $\mu\text{m}$ , and is also typically equal to or less than 100  $\mu\text{m}$ , is preferably equal to or less than 75  $\mu\text{m}$ , and is more preferably equal to or less than 50  $\mu\text{m}$  from the viewpoint of rigidity, breathability, and easiness of adjustment at the time of paper manufacturing. Examples of the shape of the wrapping paper of the flavor generating article 110 include a square shape and a rectangular shape. In a case where the wrapping paper is used as a wrapping paper for wrapping the tobacco filling material (for producing the smokable material), an example length of one side can be about 12 mm to 70 mm, an example length of the other side can be 15 mm to 28 mm, and an example length of the other side can be 22 mm to 24 mm and can more preferably be about 23 mm. When the tobacco filling material is wrapped in a columnar shape by the wrapping paper, the columnar paper pipe shape is achieved by causing the end of the wrapping paper in the width direction and the other end on the opposite side to overlap each other by about 2 mm and gluing them, and a shape with the inside filled with the tobacco filling material is obtained. The size of the wrapping paper with the rectangular shape can be determined depending on the size of the finished smokable material. In a case where the smokable material and another member that is adjacent to the smokable material are coupled to each other and are wrapped together like a tipping paper, an example length of one side can be 20 mm to 60 mm, and an example length of the other side can be 15 mm to 28 mm.

**[0086]** The wrapping paper may contain a filler in addition to the above pulp. Example content of the filler can be equal to or greater than 10% by weight and less than 60% by weight, and preferable content is equal to or greater than 15% by weight and equal to or less than 45% by weight with respect to the total weight of the wrapping paper. The filler is preferably contained in the wrapping paper in amount of equal to or greater than 15% by weight and equal to or less than 45% by weight in a preferable range of the basis weight (equal to or greater than 25 gsm and equal to or less than 45 gsm). Moreover, when the basis weight is equal to or greater than 25 gsm and equal to or less than 35 gsm, the filler is preferably contained in amount of equal to or greater than 15% by weight and equal to or less than 45% by weight, and when the basis weight is greater than 35 gsm and equal to or less than 45 gsm, the filler is preferably contained in amount of equal to or greater than 25% by weight and equal to or less than 45% by weight. Although it is possible to use calcium carbonate, titanium dioxide, kaolin, or the like as a filler, it is preferable to use calcium carbonate from the viewpoint of enhancing flavor, a white level, and the like. The paper containing these fillers exhibit a white-based bright color that is preferable from the viewpoint of an appearance for utilization as a wrapping paper for the flavor generating article 110 and can permanently keep the whiteness. It is possible to set the ISO white level of the wrapping paper to be equal to or greater than 83%, for example, by containing a large amount of such fillers. Also, the first wrapping paper 112 and the second wrapping paper preferably have tensile strength of equal to or greater than 8 N/15 mm from the viewpoint of practical use as wrapping papers for the flavor generating article 110. In this manner, the wrapping papers are less likely to be damaged when the flavor generating article 110 held by the holding portion is pulled out. The tensile strength can be enhanced by reducing the content of the fillers. Specifically, it is possible to enhance the tensile strength by reducing the content of the fillers to be less than the upper limit of the content of the fillers described in regard to each range of exemplified basis weights.

**[0087]** Various aids other than the base paper and the fillers may be added to the wrapping papers, and it is possible to include a water proofness improver for improving water proofness, for example. The water proofness improver contains a wet paper strength enhancing agent (WS agent) and a sizing agent. Examples of the wet paper strength enhancing agent include a urea formaldehyde resin, a melamine formaldehyde resin, polyamide epichlorohydrin (PAE), and the like. Also, examples of the sizing agent include a rosin soap, an alkyl ketene dimer (AKD), alkenyl succinic anhydride (ASA), a high-saponification polyvinyl alcohol with a saponification level of equal to or greater than 90%, and the like.

A paper strength enhancer may be added as an aid, and examples thereof include polyacrylamide, a cationic starch, an oxidized starch, CMC, a polyamide epichlorohydrin resin, a polyvinyl alcohol, and the like. Particularly, the oxidized starch is known to improve breathability by using a very small amount thereof (Japanese Patent Laid-Open No. 2017-218699). Also, the wrapping paper may be appropriately coated.

**[0088]** A coating agent may be added to at least one surface out of the two surfaces, namely the front surface and the back surface of the wrapping paper. Although the coating agent is not particularly limited, a coating agent capable of forming a film on the surface of the paper and reducing liquid permeability is preferably used. Examples thereof include polysaccharides such as an alginic acid and salts thereof (for example, a sodium salt) and pectin, cellulose derivatives such as ethyl cellulose, methyl cellulose, carboxymethyl cellulose, and nitro cellulose, and starch and derivatives thereof (for example, ether derivatives such as carboxymethyl starch, hydroxy alkyl starch, and cationic starch and ester derivatives such as starch acetate, starch phosphate, and starch octenyl succinate).

(Disclosure regarding tipping paper (second wrapping paper 113))

**[0089]** The configuration of the tipping paper is not particularly limited, typical aspects can be employed, and examples thereof include a configuration containing pulp as a main component. As the pulp, pulp manufactured and obtained by mixing non-wooden pulp typically used for a wrapping paper for a tobacco product, such as flax pulp, cannabis pulp, sisal pulp, or esparto may be used as well as pulp produced by mixing wooden pulp such as softwood pulp and hardwood pulp. One kind of such pulp may be used alone, or a plurality of kinds thereof may be used in combination at an arbitrary proportion. Also, although the number of configuring tipping paper may be one, a plurality of tipping paper may configure it. As aspects of the pulp, it is possible to use chemical pulp obtained by a kraft cooking method, an acidic/neutral/alkaline sulfite cooking method, a soda salt cooking method, or the like, ground pulp, chemiground pulp, thermomechanical pulp, or the like. Note that tipping paper manufactured by a manufacturing method, which will be described later, or a commercially available product may be used as the tipping paper. The shape of the tipping paper is not particularly limited and may be a square shape or a rectangular shape, for example.

**[0090]** Although the basis weight of the tipping paper is not particularly limited, the basis weight is typically equal to or greater than 32 gsm and equal to or less than 40 gsm, is preferably equal to or greater than 33 gsm and equal to or less than 39 gsm, and is more preferably equal to or greater than 34 gsm and equal to or less than 38 gsm. Although the ventilation level of the tipping paper is not particularly limited, the ventilation level is typically equal to or greater than 0 CORESTA units and equal to or less than 30000 CORESTA units and is preferably greater than 0 CORESTA units and equal to or less than 10000 CORESTA units. The ventilation level is a value measured in accordance with ISO 2965:2009 and is represented by the flow amount (cm<sup>3</sup>) of gas passing through an area 1 cm<sup>2</sup> per minute when a differential pressure of both surfaces of the paper is 1 kPa. 1 CORESTA unit (1 C.U.) is cm<sup>3</sup>/(min·cm<sup>2</sup>) under 1 kPa.

**[0091]** The tipping paper may contain a filler in addition to the above pulp, examples thereof include metal carbonate such as calcium carbonate and magnesium carbonate, metal oxide such as titanium oxide, titanium dioxide, and aluminum oxide, metal sulfate such as barium sulfate and calcium sulfate, and metal sulfide such as zinc sulfide, quartz, kaolin, talc, diatomaceous earth, and plaster, and the tipping paper particularly preferably contains calcium carbonate from the viewpoint of improving a white level and opacity and increasing a heating speed. Also, one kind of these fillers may be used alone, or two or more kinds thereof may be used together.

**[0092]** Various aids may be added to the tipping paper in addition to the above pulp, the fillers, and the like, and it is possible to include a water proofness improver for improvement, for example. The water proofness improver contains a wet paper strength enhancing agent (WS agent) and a sizing agent. Examples of the wet paper strength enhancing agent include a urea formaldehyde resin, a melamine formaldehyde resin, polyamide epichlorohydrin (PAE), and the like. Also, examples of the sizing agent include a rosin soap, an alkyl ketene dimer (AKD), alkenyl succinic anhydride (ASA), a high-saponification polyvinyl alcohol with a saponification level of equal to or greater than 90%, and the like.

**[0093]** A coating agent may be added to at least one surface out of the two surfaces, namely the front surface and the back surface of the tipping paper. Although the coating agent is not particularly limited, a coating agent capable of forming a film on the surface of the paper and reducing liquid permeability is preferably used.

**[0094]** Although the configuration of the flavor generating article 110 according to the present aspect can be used for an electrically heated tobacco product, it is also possible to apply the configuration to a cigarette to be burned (paper-wrapped tobacco). A part of the outer surface of the tipping paper may be covered with a lip release material 117. The lip release material 117 means a material configured to assist easy releasing of contact between a lip and the tipping paper substantially with no adhesion when the user holds the mouthpiece portion of the flavor generating article 110 in his/her mouth. The lip release material 117 may contain, for example, ethyl cellulose, methyl cellulose, or the like. For example, the outer surface of the tipping paper may be coated with the lip release material 117 by applying an ethyl cellulose-based or methyl cellulose-based ink to the outer surface of the tipping paper.

**[0095]** In the present aspect, the lip release material 117 of the tipping paper is disposed at least in a predetermined mouthpiece region that comes into contact with the lip of the user when the user holds the mouthpiece portion in his/her

mouth. More specifically, the lip release material disposed region covered with the lip release material 117 in the outer surface of the tipping paper is defined as a region located between the mouthpiece end of the mouthpiece portion and the ventilation hole.

5 [0096] Next, an inner structure of the flavor inhaler 100 will be described. Fig. 3 is a sectional view of the flavor inhaler 100 seen along the arrow 3-3 illustrated in Fig. 1B. As illustrated in Fig. 3, a placement portion 10 where accommodated elements such as a power source portion 20 and an atomization portion 30, which will be described later, are placed is provided inside the outer housing 101 of the flavor inhaler 100. The placement portion 10 is made of a resin, for example, and can be formed of polycarbonate (PC), acrylonitrile-butadiene-styrene (ABS) resin, polyether ether ketone (PEEK), a polymer alloy containing a plurality of polymers, or the like. Note that the placement portion 10 may include a part formed of metal such as aluminum, for example. Here, the placement portion 10 is preferably polycarbonate from the viewpoint of heat resistance, workability, and strength. The power source portion 20 and the atomization portion 30 are provided in the inner space of the placement portion 10. Note that the power source portion 20 and the atomization portion 30 cannot be replaced after the flavor inhaler 100 is assembled. Also, the outer housing 101 and the placement portion 10 may be collectively referred to as a casing.

15 [0097] The power source portion 20 includes a power source 21. The power source 21 can be a chargeable battery or a non-chargeable battery, for example. The power source 21 is electrically connected to the atomization portion 30. The power source 21 can thus supply power to the atomization portion 30 to appropriately heat the flavor generating article 110.

20 [0098] The atomization portion 30 has a chamber 50 (corresponding to an example of an accommodating portion) extending in an insertion direction (Z-axis direction) of the flavor generating article 110, a heating portion 40 disposed in the axial direction (Z-axis direction) of the chamber 50 and covering a part of the chamber 50, a heat insulating portion 32, and a substantially tubular insertion guide member 34 as illustrated in the drawing. The chamber 50 is configured to accommodate the flavor generating article 110 therein. The inner circumferential surface of the chamber 50 is provided with a boss (corresponding to a holding portion or a protrusion), which is not illustrated, to hold the accommodated flavor generating article 110. Details of the boss will be described later.

25 [0099] The heating portion 40 is configured to come into contact with an outer circumferential surface of the chamber 50 and heat the flavor generating article 110 accommodated in the chamber 50. Here, the heating portion 40 does not include a heating element to be inserted into the flavor generating article 110. As illustrated in the drawing, a bottom member 36 may be provided at the bottom portion of the chamber 50. The bottom member 36 can function as a stopper that positions the flavor generating article 110 inserted into the chamber 50. The bottom member 36 has irregularity on a surface that the flavor generating article 110 abuts and can define a space into which air can be supplied on the surface that the flavor generating article 110 abuts. The bottom member 36 is made of a resin, for example, and may be formed of polycarbonate (PC), an acrylonitrile-butadiene-styrene (ABS) resin, a polymer alloy or the like containing polyether ether ketone (PEEK) or a plurality of types of polymers, or metal such as aluminum, in particular. Note that the bottom member 36 is preferably formed of a material with a low heat conductivity to prevent heat from being transmitted to the heat insulating portion 32 and the like.

30 [0100] The heat insulating portion 32 has a substantially tubular shape as a whole and is disposed to cover the chamber 50. The heat insulating portion 32 can include an aerogel sheet, for example. The insertion guide member 34 is provided between the outer housing 101 and the chamber 50. The insertion guide member 34 is configured not to be able to escape to the outside of the casing with a claw engaged with the casing if the insertion guide member 34 is inserted from the opening of the outer housing 101 into the casing. The insertion guide member 34 is made of a resin, for example, and may be formed of polycarbonate (PC), an acrylonitrile-butadiene-styrene (ABS) resin, or a polymer alloy or the like containing polyether ether ketone (PEEK) or a plurality of types of polymers, in particular. Note that the insertion guide member 34 may be formed of metal, glass, ceramics, or the like. Also, the insertion guide member 34 is preferably made of PEEK from the viewpoint of heat resistance. The insertion guide member 34 communicates with the outside of the flavor inhaler 100 when the slide cover 102 is at the open position, and the insertion guide member 34 guides insertion of the flavor generating article 110 into the chamber 50 by inserting the flavor generating article 110 into a through-hole 34a in the insertion guide member 34. The slide cover 102 is configured to cover at least a part of the insertion guide member 34 in the axial direction (Z-axis direction) of the chamber 50 with the through-hole 34a in the insertion guide member 34 exposed to the outside when the slide cover 102 is at the open position. In Fig. 3, a state where the slide cover 102 is closed to cover the entire through-hole 34a in the insertion guide member 34 is illustrated by the two-dotted chain line.

35 [0101] The flavor inhaler 100 further has a first holding portion 37 and a second holding portion 38 that hold both ends of the chamber 50 and the heat insulating portion 32. The first holding portion 37 is disposed to hold the end portions of the chamber 50 and the heat insulating portion 32 on the negative direction side of the Z axis. The second holding portion 38 is disposed to hold the end portions of the chamber 50 and the heat insulating portion 32 on the side of the slide cover 102 (the positive direction side of the Z axis).

50 [0102] Next, a structure of the chamber 50 will be described. Fig. 4A is a perspective view of the chamber 50 according

to the present embodiment. Fig. 4B is a sectional view of the chamber 50 along the arrow 4B-4B illustrated in Fig. 4A. Fig. 5A is a sectional view of the chamber 50 along the arrow 5A-5A illustrated in Fig. 4B. Fig. 5B is a sectional view of the chamber 50 along the arrow 5B-5B illustrated in Fig. 4B. Fig. 6 is a perspective view of the chamber 50 and the heating portion 40 according to the present embodiment.

5 **[0103]** As illustrated in Figs. 4A and 4B, the chamber 50 can have a tubular shape including an opening 52 into which the flavor generating article 110 is inserted and a tubular side wall portion 60 that accommodates the flavor generating article 110. A flange portion 52a is formed at an end portion that defines the opening 52 of the chamber 50. The chamber 50 is disposed such that the flange portion 52a provided on the side opposite to a bottom portion 56 faces the opening of the outer housing 101. The chamber 50 is preferably formed of a material with heat resistance and a small coefficient of thermal expansion and can be formed of, for example, stainless steel. Note that the chamber 50 may be formed of a resin such as PEEK, glass, ceramics, or the like as well as metal. This enables effective heating of the flavor generating article 110 from the chamber 50. Note that the chamber 50 is not limited to the tubular shape and may have a cup shape.

10 **[0104]** As illustrated in Figs. 4B and 5B, the side wall portion 60 includes contact portions 62 and a separated portion 66. When the flavor generating article 110 is disposed at a desired position in the chamber 50, the contact portions 62 come into contact with or press a part of the flavor generating article 110 in the axial direction (Z-axis direction) of the chamber 50, and the separated portion 66 is separated from the flavor generating article 110. In other words, the chamber 50 compresses and holds the inserted flavor generating article 110. Note that in the specification, "the desired position in the chamber 50" means the position at which the flavor generating article 110 is appropriately heated or the position of the flavor generating article 110 when the user smokes. Each contact portion 62 has an inner surface 62a and an outer surface 62b. The separated portion 66 has an inner surface 66a and an outer surface 66b. As illustrated in Fig. 6, the heating portion 40 is disposed on the outer surface 62b of the contact portion 62. The heating portion 40 is preferably disposed with no clearance from the outer surface 62b of the contact portion 62. Note that the heating portion 40 may include an adhesive layer. In that case, the heating portion 40 including the adhesive layer is preferably disposed with no clearance from the outer surface 62b of the contact portion 62.

15 **[0105]** As illustrated in Figs. 4A and 5B, the outer surface 62b of the contact portion 62 is a planar surface. It is possible to prevent a strip-shaped electrode 48 from being bent in a case where the strip-shaped electrode 48 is connected to the heating portion 40 disposed on the outer surface 62b of the contact portion 62 as illustrated in Fig. 6 by the outer surface 62b of the contact portion 62 being a planar surface. As illustrated in Figs. 4B and 5B, the inner surface 62a of the contact portion 62 is a planar surface. Also, the thickness of the contact portion 62 is uniform as illustrated in Figs. 4B and 5B.

20 **[0106]** As illustrated in Figs. 4A, 4B, and 5B, the chamber 50 has two contact portions 62 in the circumferential direction of the chamber 50, and the two contact portions 62 face each other in parallel with each other. The distance of at least a part between the inner surfaces 62a of the two contact portions 62 is preferably shorter than the width of the flavor generating article 110 inserted into the chamber 50 at the location disposed between the contact portions 62.

25 **[0107]** As illustrated in Fig. 5B, the inner surface 66a of the separated portion 66 can have an arc-shaped section as a whole in the section that perpendicularly intersects the axial direction (Z-axis direction) of the chamber 50. Also, the separated portion 66 is disposed to be adjacent to the contact portions 62 in the circumferential direction. In other words, the contact portion 62 and the separated portion 66 configure a non-circular inner circumferential surface in the section perpendicularly intersecting the axial direction (Z-axis direction) of the chamber 50.

30 **[0108]** As illustrated in Fig. 4B, the chamber 50 can have a hole 56a at the bottom portion 56 thereof such that the bottom member 36 illustrated in Fig. 3 penetrates therethrough and is disposed inside the chamber 50. The bottom member 36 can be fixed to the inside of the bottom portion 56 of the chamber 50 with an adhesive or the like. Note that the adhesive intervening between the bottom member 36 and the bottom portion 56 can be configured of a resin material such as an epoxy resin. Instead of this, an inorganic adhesive such as cement or welding can also be used. The bottom member 36 provided at the bottom portion 56 can support a part of the flavor generating article 110 inserted into the chamber 50 with at least a part of an end surface of the flavor generating article 110 exposed. Also, the bottom portion 56 can support a part of the flavor generating article 110 with the exposed end surface of the flavor generating article 110 communicating with a clearance 67 (see Fig. 7), which will be described later.

35 **[0109]** As illustrated in Figs. 4A, 4B, and 5A, the chamber 50 preferably has a tubular non-holding portion 54 between the opening 52 and the side wall portion 60. A clearance can be formed between the non-holding portion 54 and the flavor generating article 110 in a state where the flavor generating article 110 is positioned at a desired position in the chamber 50. Also, as illustrated in Figs. 4A and 4B, the chamber 50 preferably has a first guide portion 58 including a tapered surface 58a that connects the inner surface of the non-holding portion 54 to the inner surfaces 62a of the contact portions 62.

40 **[0110]** As illustrated in Fig. 6, the heating portion 40 has a heating element 42. The heating element 42 may be a heating resistor, for example. The heating element 42 is preferably disposed to heat the contact portions 62 without coming into contact with the separated portion 66 of the chamber 50. In other words, the heating element 42 is preferably disposed only on the outer surfaces of the contact portions 62. The heating element 42 may have a difference in heating

capability between a part heating the separated portion 66 of the chamber 50 and a part heating the contact portions 62. Specifically, the heating element 42 may be configured to heat the contact portions 62 to a higher temperature than that of the separated portion 66. For example, disposition densities of the heating resistor of the heating element 42 in the contact portions 62 and the separated portion 66 can be adjusted. Also, the heating element 42 may be wound  
 5 around the outer circumference of the chamber 50 while exhibiting substantially the same heating capability over the entire circumference of the chamber 50. As illustrated in Fig. 6, the heating portion 40 preferably has an electrically insulating member 44 that is configured of a resin or the like covering at least one surface of the heating element 42 in addition to the heating element 42. In the present embodiment, the electrically insulating member 44 is disposed to cover both surfaces of the heating element 42.

**[0111]** Fig. 7 is a sectional view illustrated in Fig. 5B in a state where the flavor generating article 110 is disposed at a desired position in the chamber 50 according to the present embodiment. As illustrated in Fig. 7, once the flavor generating article 110 is disposed at a desired position in the chamber 50, the flavor generating article 110 can come into contact with and be pressed by the contact portions 62 of the chamber 50. On the other hand, the clearance 67 is formed between the flavor generating article 110 and the separated portion 66. The clearance 67 can communicate with  
 15 the opening 52 of the chamber 50 and the end surface of the flavor generating article 110 located in the chamber 50. In this manner, air flowing from the opening 52 of the chamber 50 can pass through the clearance 67 and flow to the inside of the flavor generating article 110. In other words, an air flow path (clearance 67) is formed between the flavor generating article 110 and the separated portion 66.

**[0112]** Next, a specific structure of the bosses corresponding to each example will be described in regard to the chamber 50 according to the present embodiment.  
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[Example 1: Vertically long boss]

**[0113]** Fig. 8 is a sectional view illustrating the chamber 50 in Example 1 of the present embodiment. Fig. 9 is a sectional view of the chamber 50 illustrated in Fig. 8. Here, Fig. 8 is a section of the chamber 50 cut along the axis of the chamber 50 and illustrates a section perpendicularly intersecting the section illustrated in Fig. 4B. Also, Fig. 9 illustrates a section corresponding to Fig. 5A.  
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**[0114]** As illustrated in Figs. 8 and 9, bosses 51A configured to pressurize and hold the outer circumferential surface of the flavor generating article 110 accommodated in the chamber 50 inward in the radial direction of the chamber 50 are formed on the inner circumferential surface of the chamber 50. The bosses 51A are provided on the inner surfaces  
 30 62a of the contact portion 62 in the inner circumferential surface of the chamber 50. Also, the boss 51A is provided on each of the mutually facing inner surfaces 62a. Additionally, the bosses 51A are protrusions projecting from the inner surface of the chamber 50 and pressurizing the flavor generating article 110 and extend in the axial direction (Z-axis direction) of the chamber 50. The bosses 51A may be formed by embossing or may be formed by projecting members attached to the inner circumferential surface of the chamber 50. Moreover, the boss 51A may be provided on only one  
 35 of the mutually facing inner surfaces 62a, or a plurality of bosses 51A may be provided on one inner surface 62a.

**[0115]** In this manner, it is possible to hold the flavor generating article 110 with the bosses 51A in the chamber 50 while compressing and keeping the flavor generating article 110 in the chamber 50 by providing the bosses 51A on the inner surfaces 62a of the contact portion 62. Therefore, it is possible to prevent the flavor generating article 110 from  
 40 falling off from the chamber 50 even in a case where a stress acts on the flavor generating article 110. Also, it is possible to stably hold the flavor generating article 110 in the chamber 50 by configuring the bosses 51A with the projections extending in the axial direction (Z-axis direction) of the chamber 50.

**[0116]** Note that the bosses 51A are provided at positions at which the bosses 51A can come into contact with at least two parts of the filling portion 111, the tubular member 114, and the filter portion 115 of the flavor generating article 110 in a case where the flavor generating article 110 is inserted into the chamber 50. For example, the bosses 51A come into contact with the filling portion 111 first and then come into contact with the tubular member 114 and the filter portion  
 45 115 when the flavor generating article 110 is inserted into the chamber 50. Therefore, it is possible to stably hold the flavor generating article 110 at a position of the chamber 50 close to the insertion end.

[Example 2: Laterally long boss]  
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**[0117]** Fig. 10 is a sectional view illustrating the chamber 50 in Example 2 of the present embodiment. Fig. 11 is a sectional view of the chamber 50 illustrated in Fig. 10. Here, Fig. 10 is a section of the chamber 50 cut along the axis of the chamber 50 and illustrates a section perpendicularly intersecting the section illustrated in Fig. 4B. Also, Fig. 11 illustrates a section corresponding to Fig. 5A.  
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**[0118]** As illustrated in Figs. 10 and 11, bosses 51B configured to pressurize and hold the outer circumferential surface of the flavor generating article 110 accommodated in the chamber 50 inward in the radial direction of the chamber 50 are formed on the inner circumferential surface of the chamber 50. The bosses 51B are provided on the inner surfaces

62a of the contact portion 62 in the inner circumferential surface of the chamber 50. Also, the boss 51B is provided on each of the mutually facing inner surfaces 62a. Also, the bosses 51B are protrusions that project from the inner circumferential surface of the chamber 50 and pressurize the flavor generating article 110 and extend in the direction perpendicularly intersecting the axial direction (Z-axis direction) of the chamber 50, specifically, a lateral direction (Y-axis direction). The bosses 51B may be formed by embossing or may be formed by projecting members attached to the inner circumferential surface of the chamber 50 similarly to Example 1. Moreover, the boss 51B may be provided on only one of the mutually facing inner surfaces 62a, or a plurality of bosses 51B may be provided on one inner surface 62a.

**[0119]** In this manner, it is possible to hold the flavor generating article 110 with the bosses 51B in the chamber 50 while compressing and keeping the flavor generating article 110 in the chamber 50 by providing the bosses 51B on the inner surfaces 62a of the contact portion 62. Therefore, it is possible to prevent the flavor generating article 110 from falling off from the chamber 50 even in a case where a stress acts on the flavor generating article 110. Additionally, rotation of the flavor generating article 110 about the Y axis is restricted by configuring the bosses 51B with the protrusions extending in the lateral direction (Y-axis direction) of the chamber 50, and it is thus possible to curb shaking of the flavor generating article 110 on the side of the separated portion 66.

**[0120]** Moreover, it is possible to stably hold the flavor generating article 110 at a position of the chamber 50 close to the insertion end by providing the bosses 51B at positions where the bosses 51B can come into contact with at least two parts of the flavor generating article 110 similarly to Example 1.

[Example 3: Dotted boss]

**[0121]** Fig. 12 is a sectional view illustrating a chamber 50 in Example 3 of the present embodiment. Fig. 13 is a sectional view of the chamber 50 illustrated in Fig. 12. Here, Fig. 12 is a section of the chamber 50 cut along the axis of the chamber 50 and illustrates a section perpendicularly intersecting the section illustrated in Fig. 4B. Also, Fig. 13 illustrates a section corresponding to Fig. 5A.

**[0122]** As illustrated in Figs. 12 and 13, the bosses 51C configured to pressurize and hold the outer circumferential surface of the flavor generating article 110 accommodated in the chamber 50 inward in the radial direction of the chamber 50 are formed on the inner circumferential surface of the chamber 50. The bosses 51C are provided on the inner surfaces 62a of the contact portion 62 in the inner circumferential surface of the chamber 50. Also, the boss 51C is provided on each of the mutually facing inner surfaces 62a. Also, the bosses 51C are dotted protrusions that project from the inner circumferential surface of the chamber 50 and pressurize the flavor generating article 110. The bosses 51C may be formed by embossing or may be formed by projecting members attached to the inner circumferential surface of the chamber 50, similarly to Example 1. Additionally, the boss 51C may be provided on only one of the mutually facing inner surfaces 62a, or a plurality of bosses 51C may be provided on one inner surface 62a.

**[0123]** In this manner, it is possible to hold the flavor generating article 110 with the bosses 51C inside the chamber 50 while compressing and keeping the flavor generating article 110 in the chamber 50 by providing the bosses 51C on the inner surfaces 62a of the contact portion 62. Therefore, it is possible to prevent the flavor generating article 110 from falling off from the chamber 50 even in a case where a stress acts on the flavor generating article 110. Moreover, it is possible to pressurize and hold the flavor generating article 110 in the chamber 50 with a simple configuration by configuring the bosses 51C with dotted protrusions.

**[0124]** Also, it is possible to stably hold the flavor generating article 110 at a position of the chamber 50 close to the insertion end by providing the bosses 51C at positions at which the bosses 51C can come into contact with at least two parts of the flavor generating article 110 similarly to Example 1.

[Experiment results]

**[0125]** Various experiments were conducted by using the flavor inhalers using the chambers 50 in Examples 1 to 3 of the present embodiment as described above and the flavor inhalers in Comparative Examples 1 to 3. The experiment results will be described below.

[Preparation of samples]

**[0126]** First, smoking systems as combinations of flavor generating articles and flavor inhalers shown in Table 1 were prepared. Here, the test inhaler 1 for Sample 1 includes the chamber 50 in Example 1 described above (see Figs. 8 and 9). The test inhaler 2 for Sample 2 is the same flavor inhaler as that for Sample 1 other than that the test inhaler 2 includes the chamber 50 in Example 2 described above (see Figs. 10 and 11). The test inhaler 3 for Sample 3 is the same inhaler as that for Sample 1 other than that the test inhaler 3 includes the chamber 50 in Example 3 described above (see Figs. 12 and 13).

**[0127]** Also, the flavor inhalers for Samples 4 to 6 are commercially available Ploom S2.0, Ploom, and glo hyper (glo

is a registered trademark), respectively. Note that the flavor generating articles for Samples 1 to 5 were manufactured for utilization mainly for the test inhalers 1 to 3, Ploom S2.0, and Ploom (sold in Russia and UK). Also, the flavor generating article for Sample 6 is a commercially available product dedicated for glo hyper.

**[0128]** Here, the relationships between the flavor generating articles and the test inhalers 1 to 3 for Samples 1 to 3 correspond to the combination articles of consumable articles and device kits, for example. Each combination article includes a consumable article including the flavor generating articles for Samples 1 to 3 and a device kit including any of the test inhalers 1 to 3 for Samples 1 to 3, and at least one of the consumable article and the device kit includes a display that indicates that the at least one is used for the other one of the consumable article and the device kit. In other words, the consumable article is a dedicated article for the device kit. Note that the display include, for example, "adapted for X", "for X", or "designed for X" (X is a brand name, a product name, or the like). Also, the consumable article includes a package for the consumable article, while the device kit includes, for example, a package and a written instruction.

[Table 1]

Sample No.	Flavor generating article	Flavor inhaler	Remarks
Sample 1 (Example 1)	Test smokable article	Test inhaler 1	
Sample 2 (Example 2)	Test smokable article	Test inhaler 2	
Sample 3 (Example 3)	Test smokable article	Test inhaler 3	
Sample 4 (Comparative Example 1)	Test smokable article	Ploom S2.0	
Sample 5 (Comparative Example 2)	Test smokable article	Ploom	Sold in Russia and UK
Sample 6 (Comparative Example 3)	neo designed for glo Tropical Swirl	glo hyper	

[Method for measuring resistance value]

**[0129]** A resistance value (insertion resistance) of each sample when the flavor generating article was inserted into the flavor inhaler was measured by using EZ-S500N (hereinafter, also referred to as a device) manufactured by Shimadzu Corporation. Specifically, the flavor inhaler was attached to a flavor inhaler jig attached to the device first. Then, one end of the flavor generating article (an end that was not on the side of the mouthpiece portion) was inserted into the flavor inhaler to such an extent that the flavor generating article did not wobble. Then, a pushing jig was brought into contact with the other end of the flavor generating article (an end on the side of the mouthpiece portion). Next, zero point correction of the resistance value of the device was conducted.

**[0130]** Subsequently, it was confirmed that the flavor inhaler and the flavor generating article were not inclined, and the pushing jig was lowered. The stoke speed of the pushing jig at this time was set to 60 mm/min. Also, the temperature was 25°C, and the humidity was 20% as test conditions. Note that the sampling length was set to 50 msec in the device, and in this case, the length of one section of acquired data was 0.05 mm. Next, once the operation of the pushing jig stopped after the pushing jig was lowered by a predetermined length, the test was ended. The aforementioned measurement was conducted twice for each sample.

[Acquisition of resistance value]

**[0131]** An average value of the two results of the measurement conducted on each sample was defined as a resistance value. In this case, the position when the distal end of the flavor generating article reached the end position of the chamber was determined for each measurement result first, the two measurement results were aligned on the basis of the determined position, and the average value was thereby acquired. Then, each value was acquired from the range at 10 mm from the end position of the chamber as a target. In other words, the insertion force, the average resistance, the local resistance, the local resistance position, and the minimum resistance, which will be described later, were acquired in the range of 10 mm from the end position of the chamber.

**[0132]** Figs. 14 to 19 are graphs illustrating a relationship between the distance (mm) from the end position of the chamber and the measured resistance value (N) in each of Samples 1 to 6. In Figs. 14 to 19, the position of the pushing jig corresponding to the end position of the chamber is illustrated as zero, the position before reaching the end position is illustrated as a positive value, and the position after reaching the end position is illustrated as a negative value. For example, the position at +10 mm in Figs. 14 to 19 means the position at 10 mm before the end position in the insertion direction of the flavor generating article.

**[0133]** Here, "the position when reaching at the end position of the chamber" (hereinafter, also referred to as an end position is defined as a position in a section immediately before a region where a section in which a difference in resistance

## EP 4 331 400 A1

values between a section and a section immediately before the section (that is a difference in resistance values in 0.05 mm) is equal to or greater than 0.1N from among the resistance values measured by the aforementioned method continues in 0.5 mm in a case where there is such a region.

5 [Insertion force]

**[0134]** The insertion force of each sample was acquired from data of the resistance value acquired by the aforementioned method. Here, the insertion force means the resistance value when the distal end of the flavor generating article has reached the end position of the chamber.

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[Average resistance]

**[0135]** An average resistance of each sample was acquired from the data of the resistance value acquired by the aforementioned method. Here, a first half portion average resistance and a second half portion average resistance were evaluated. The first half portion average resistance means an average of the resistance values in the position range of 10 mm to 5 mm from the end, while the second half portion average resistance means an average of resistance values in a position range of 5 mm to 0 mm from the end. Also, a ratio of the second half portion average resistance with respect to the first half portion average resistance (second half portion/first half portion) will also be referred to as a first resistance ratio.

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[Local resistance and local resistance position]

**[0136]** The local resistance and the local resistance position of each sample were acquired from the data of the resistance value acquired by the aforementioned method. Here, the local resistance means a maximum resistance value in a local variation region in which the resistance value varies by a predetermined amount or more in a predetermined region, specifically, a region between the first local increase and the last local decrease in a case where the local increase and the local decrease are present in this order within a continuous range of 1.0 mm. Note that the local increase means that the resistance value increases by 0.1 N or more in two continuous sections. Also, the local decreases mean that the resistance value decreases by 0.05 N or more in two continuous sections. Additionally, a ratio between the local resistance and the insertion force will be referred to as a second resistance ratio. Moreover, the local resistance position means the position from the end position of the chamber in a case where the local resistance has occurred, that is, the distance from the end position of the chamber to the position where the local resistance has occurred.

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[Minimum resistance]

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**[0137]** The minimum resistance of each sample was acquired from the data of the resistance value acquired by the aforementioned method. Here, the minimum resistance means the minimum resistance value between the local resistance position and the end position of the chamber.

**[0138]** The insertion force, the average resistance, the local resistance, the local resistance position, and the minimum resistance acquired for each of Samples 1 to 6 are shown in Table 2.

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[Table 2]

Sample No.	Insertion force (N)	Average resistance			Local resistance		Minimum resistance [N]	Local resistance/insertion force	Local resistance/minimum resistance
		First half portion average resistance [N]	Second half portion average resistance [N]	Second half portion/ first half portion	Local resistance [N]	Local resistance position [mm]			
Sample 1	2.88	1.40	2.26	1.61	1.94	4.6	0.68	1.18	
Sample 2	1.69	1.15	1.26	1.10	1.56	5.8	0.93	1.46	
Sample 3	1.73	0.84	1.44	1.71	1.66	4.0	0.96	1.24	
Sample 4	4.86	2.56	4.06	1.59	N/A	N/A	N/A	N/A	
Sample 5	4.46	2.24	3.78	1.69	N/A	N/A	N/A	N/A	
Sample 6	0.62	0.67	0.59	0.88	N/A	N/A	N/A	N/A	

[Sensory evaluation]

5 [0139] Five trained panels with discrimination abilities conducted sensory evaluation for whether it was easy to feel reaching at the end of the chamber and whether it was easy to expect reaching at the end of the chamber when the flavor generating article was inserted into the chamber for each of Samples 1 to 6. Note that the state where it was easy to feel reaching at the end of the chamber will also be referred to as a state where it was possible to obtain a sense of end reaching and the state where it was easy to expect reaching at the end of the chamber will also be referred to as a state where it was possible to obtain a sense of expectation of end reaching.

10 [Sensory evaluation of Sample 6]

[0140] First, in regard to the sense of end reaching, the five panels evaluated the degrees at which they felt that the distal end of the flavor generating article had reached the end of the chamber by using Sample 6, in panel discussion. Evaluation criteria were as follows.

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- It was difficult to feel reaching at the end.
- It was possible to feel reaching at the end.

20 [0141] Next, in regard to the sense of expectation of end reaching, the five panels evaluated the degrees at which they were able to expect that the distal end of the flavor generating article would reach the end of the chamber by using Sample 6, in panel discussion. Evaluation criteria were as follows.

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- It was difficult to expect reaching at the end.
- It was possible to expect reaching at the end.

30 [Sensory evaluation of Samples 1 to 5]

[0142] As a result of the evaluation in panel discussion, it was discovered that in regard to Sample 6, it was easy to feel that the distal end of the flavor generating article had reached the end of the chamber while it was difficult to expect that the distal end of the flavor generating article would reach the end of the chamber.

35 [0143] Next, in regard to the sense of end reaching, the same five panels scores the degrees at which they were able to feel that the distal end of the flavor generating article had reached the end of the chamber independently in five-level evaluation from 1 to 5 points by using Samples 1 to 5 on the assumption that the degree of Sample 6 was 3 points, and average values thereof were calculated. The evaluation criteria were as follows.

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- 5 points: It was easy to feel end reaching.
- 4 points: It was slightly easy to feel end reaching.
- 3 points: No change was felt.
- 2 points: It was slightly difficult to feel end reaching.
- 1 point: It was difficult to feel end reaching.

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[0144] Next, in regard to the sense of expectation of end reaching, the same five panels scores the degrees at which they were able to expect that the distal end of the flavor generating article would reach the end of the chamber independently in five-level evaluation from 1 to 5 points by using Samples 1 to 5 on the assumption that the degree of Sample 6 was 3 points, and average values thereof were calculated. The evaluation criteria were as follows.

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- 5 points: It was easy to expect end reaching.
- 4 points: It was slightly easy to expect end reaching.
- 3 points: No change was felt.
- 2 points: It was slightly difficult to expect end reaching.
- 1 point: It was difficult to expect end reaching.

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[0145] Results of evaluating the sense of end reaching and the sense of expectation of end reaching for each of Samples 1 to 6 are shown in Table 3.

[Table 3]

Sample No.	Sense of end reaching	Sense of expectation of end reaching
Sample 1	3.3	3.5
Sample 2	4	4.8
Sample 3	4.1	4.9
Sample 4	2.3	3.4
Sample 5	1	1.4
Sample 6	3	3

[Reviewing of results]

**[0146]** As shown in Table 2, the insertion force is equal to or less than 4.00 N in Samples 1 to 3, it is possible to feel reaching at the end of the chamber when the flavor generating article is inserted into the chamber. Also, since the first resistance ratio is greater than 1.0 in Samples 1 to 3, a sense of an increase in insertion resistance on the side closer to the end of the chamber helps sensing of an approach to the end, and it is thus possible to easily expect reaching at the end of the chamber. Additionally, since the local variation region is provided in Samples 1 to 3, it becomes easy for the user to feel an approach to the end of the chamber, and it becomes easier to expect the reaching at the end of the chamber.

**[0147]** In practice, the evaluation of both the sense of end reaching and the sense of expectation of end reaching for Samples 1 to 3 exceed 3 points as illustrated in Table 3. Therefore, it has been confirmed that both the sense of end reaching and the sense of expectation of end reaching from Samples 1 to 3, that is, both the sense of end reaching and the sense of expectation of end reaching are achieved. This is considered to be because it is easy to obtain the sense of end reaching due to a small feeling of resistance at the time of the insertion of the flavor generating article in Samples 1 to 3. Also, since lowering of the resistance value can be felt after the resistance value increases in the local variation region as illustrated in Fig. 15 in Sample 2, it is considered to be yet easier to obtain the sense of end reaching. Also, since hooking is felt once at the time of the insertion of the flavor generating article and reaching at the end of the chamber is then felt by pushing it again in Samples 1 to 3, it is considered to be easy to obtain the sense of expectation of end reaching.

**[0148]** Note that the lower limit value of the insertion force is preferably equal to or greater than 0.50 N, is more preferably equal to or greater than 0.70 N, and is further preferably equal to or greater than 1.00 from the viewpoint of curbing dropping of the flavor generating article. Also, the upper limit value of the insertion force is preferably equal to or less than 3.00 N and is more preferably equal to or less than 2.00 N from the viewpoint of easiness of insertion. Also, the lower limit value of the first resistance ratio is preferably equal to or greater than 1.0 and is more preferably equal to or greater than 1.05 from the viewpoint of making it easy to obtain the sense of expectation of end reaching. Also, the upper limit value of the first resistance ratio is preferably equal to or less than 2.0 and is more preferably equal to or less than 1.8.

**[0149]** Also, since the second resistance ratio that is a ratio between the resistance value in the local variation region and the insertion force is equal to or greater than 0.8 in Samples 2 and 3 as shown in Table 2, it is possible to prevent a significantly small resistance value in the local variation region as compared with the insertion force from being not able to contribute to expectation of reaching at the end of the chamber.

**[0150]** In practice, evaluation of both the sense of end reaching and the sense of expectation of end reaching in Samples 2 and 3 exceed four points as shown in Table 3. Therefore, both the sense of end reaching and the sense of expectation of end reaching are obtained, and it has been confirmed that both the sense of end reaching and the sense of expectation of end reaching are achieved, particularly, a high sense of expectation of end reaching is obtained, from Samples 2 and 3. Referring to Figs. 14 to 16, since the resistance value in Samples 2 and 3 after hooking is felt once at the time of the insertion of the flavor generating article is smaller than that in Sample 1, it is considered to be easier to obtain the sense of expectation of end reaching.

**[0151]** Note that the upper limit value of the second resistance ratio is preferably equal to or less than 1.0. If a resistance value that is greater than the insertion force is present in the local variation region, there is a concern that it may make the user feel uncomfortable, and there is also a concern that the user mistakes the local variation region for the end position of the chamber. Also, if an excessively large local resistance value is present, there is a concern that the flavor generating article causes buckling in the local variation region. Additionally, the lower limit value of the second resistance ratio is preferably equal to or greater than 0.8 and is more preferably equal to or greater than 0.9 from the viewpoint of allowing the user to expect reaching at the end by the local resistance.

**[0152]** Also, since the distance from the end position of the chamber to the local variation region in Sample 3 is equal to or less than 5.0 mm as shown in Table 2, the user can maintain the feeling of passing through the local variation region until reaching at the end of the chamber, and it becomes easier to expect the reaching at the end of the chamber.

**[0153]** In practice, evaluation of the sense of end reaching and the sense of expectation of end reaching in Sample 3 are the largest from among Samples 1 to 3 as shown in Table 3. Therefore, it has been confirmed that both the sense of end reaching and the sense of expectation of end reaching are obtained, and that both the sense of end reaching and the sense of expectation of end reaching are achieved, particularly, a significantly high sense of expectation of end reaching is obtained, from Sample 3.

**[0154]** Note that the upper limit value of the distance from the end position of the chamber to the local variation region is preferably equal to or less than 6.5 mm and is more preferably equal to or less than 6.0 mm. Also, the lower limit value of the distance from the end position of the chamber to the local variation region is preferably equal to or greater than 2.0 mm, is more preferably equal to or greater than 3.0 mm, and is further preferably equal to or greater than 3.5 mm from the viewpoint of preventing the end of the chamber from reaching before the user obtains the feeling of passing through the local variation region due to the end position of the chamber and the local variation region being located close to each other.

**[0155]** On the other hand, since the insertion force is high in Samples 4 and 5, it is difficult to feel that the distal end of the flavor generating article has reached the end of the chamber, and it is difficult to expect the distal end will reach the end of the chamber. Also, although it is possible to feel the distal end of the flavor generating article has reached the end of the chamber as described above in Sample 6, it is difficult to expect that the distal end of the flavor generating article will reach the end of the chamber.

**[0156]** Although the embodiment of the present invention has been described above, the present invention is not limited to the above embodiment, and various modification can be made within the scope of the technical idea described in the claims, the specification, and the drawings. Note that any shapes and materials that are not directly described in the specification and the drawings also fall within the scope of the technical idea of the invention of the present application as long as the effects and the advantages of the invention of the present application can be achieved.

**[0157]** For example, although the flavor inhaler 100 according to the present embodiment has a so-called counterflow-type air flow path through which air flowing from the opening 52 of the chamber 50 is supplied to the end surface of the flavor generating article 110, the present invention is not limited thereto, and the flavor inhaler 100 may have a so-called bottom flow-type air flow path through which air is supplied from the bottom portion 56 of the chamber 50 to the inside of the chamber 50. Also, the heating element 42 is not limited to a resistance heating type and may be an induction heating type. In that case, the heating element 42 can heat the chamber 50 through induction heating. Also, the flavor generating article 110 may have a susceptor that is a heating element. In this case, the flavor inhaler 100 does not include any heating element to be inserted into the flavor generating article, and the susceptor that is the heating element is present inside the flavor generating article 110. Note that the structure in which the heating element 42 is disposed in the surroundings of the chamber 50 to raise the temperature of the flavor generating article 110 in the chamber 50 has been described, a method of raising the temperature of the flavor generating article 110 in the chamber 50 may be a method of bringing the heating element 42 to direct contact with the flavor generating article 110 or may be a method of generating frictional heat due to vibration of substances in the flavor generating article 110.

#### REFERENCE SIGNS LIST

#### **[0158]**

40 Heating portion  
 45 50 Chamber  
 51A to 51C Boss  
 62 Contact portion  
 66 Separated portion  
 50 100 Flavor inhaler  
 110 Flavor generating article  
 111 Filling portion  
 114 Tubular member  
 115 Filter portion

#### Claims

1. A smoking system comprising:

a flavor inhaler; and a flavor generating article,  
 wherein the flavor inhaler includes an accommodating portion that has an opening formed at one end and  
 accommodates at least a part of the flavor generating article via the opening, and  
 when a resistance value when the flavor generating article is inserted into the accommodating portion and a  
 distal end of the flavor generating article reaches an end of the accommodating portion is defined as an insertion  
 force A, and

a ratio of a second half portion average resistance that is an average of resistance values from a middle point  
 between a predetermined position of the accommodating portion on a side of an insertion end and the end of  
 the accommodating portion to the end of the accommodating portion with respect to a first half portion average  
 resistance that is an average of resistance values from the predetermined position to the middle point between  
 the predetermined position and the end of the accommodating portion in a case where the flavor generating  
 article is inserted into the accommodating portion is defined as a first resistance ratio B,  
 Expression (1) and Expression (2) below are satisfied

$$A \leq 4.00 \text{ N} \dots (1)$$

$$B > 1.0 \dots (2).$$

2. The smoking system according to claim 1,  
 wherein at least one local variation region in which a resistance value varies by a predetermined amount or more  
 within a predetermined range in a case where the flavor generating article is inserted into the accommodating portion  
 is provided.

3. The smoking system according to claim 2,  
 wherein when a ratio between the resistance value in the local variation region and the insertion force is defined  
 as a second resistance ratio C,  
 Expression (3) below is satisfied

$$C \geq 0.8 \dots (3).$$

4. The smoking system according to claim 2 or 3,  
 wherein when a distance between an end position of the accommodating portion and the local variation region  
 is defined as a distance D,  
 Expression (4) below is satisfied

$$D \leq 5.0 \text{ mm} \dots (4).$$

5. The smoking system according to any one of claims 1 to 4,  
 wherein the smoking system further includes a heating portion that heats the flavor generating article accom-  
 modated in the accommodating portion, and  
 the heating portion is provided at the flavor inhaler and does not have a heating element to be inserted into the  
 flavor generating article.

6. The smoking system according to any one of claims 1 to 5,  
 wherein the flavor generating article includes

a filling portion that is filled with a smokable material,  
 a hollow tubular portion that is provided continuously with the filling portion, and  
 a filter portion that is provided continuously with the tubular portion,

the accommodating portion includes a holding portion that holds the flavor generating article accommodated in the accommodating portion, and the holding portion is provided at a position at which the holding portion is able to come into contact with at least two parts of the flavor generating article in a case where the flavor generating article is inserted into the accommodating portion.

7. The smoking system according to any one of claims 1 to 6, wherein the accommodating portion includes

a contact portion that pressurizes a part of the accommodated flavor generating article in an axial direction of the accommodating portion, and a separated portion that is separated from the accommodated flavor generating article.

8. A device kit comprising:

the flavor inhaler according to any one of claims 1 to 7; and a display that indicates that the device kit is used for the flavor generating article according to any one of claims 1 to 7.

9. A consumable article comprising:

the flavor generating article according to any one of claims 1 to 7; and a display that indicates that the consumable article is used for the flavor inhaler according to any one of claims 1 to 7.

10. A combination article of a consumable article and a device kit, comprising:

a consumable article that includes the flavor generating article according to any one of claims 1 to 7; and a device kit that includes the flavor inhaler according to any one of claims 1 to 7, wherein at least one of the consumable article and the device kit includes a display that indicates that the at least one is used for the other one of the consumable article and the device kit.

11. A method for obtaining a sense of end reaching and a sense of expectation of end reaching in a smoking system including a flavor inhaler and a flavor generating article,

wherein the flavor inhaler includes an accommodating portion that has an opening formed at one end and accommodates at least a part of the flavor generating article via the opening, and when a resistance value when the flavor generating article is inserted into the accommodating portion and a distal end of the flavor generating article reaches an end of the accommodating portion is defined as an insertion force A, and a ratio of a second half portion average resistance that is an average of resistance values from a middle point between a predetermined position of the accommodating portion on a side of an insertion end and the end of the accommodating portion to the end of the accommodating portion with respect to a first half portion average resistance that is an average of resistance values from the predetermined position to the middle point between the predetermined position and the end of the accommodating portion in a case where the flavor generating article is inserted into the accommodating portion is defined as a first resistance ratio B, Expression (1) and Expression (2) below are satisfied

$$A \leq 4.00 \text{ N} \dots (1)$$

$$B > 1.0 \dots (2).$$

Fig. 1A

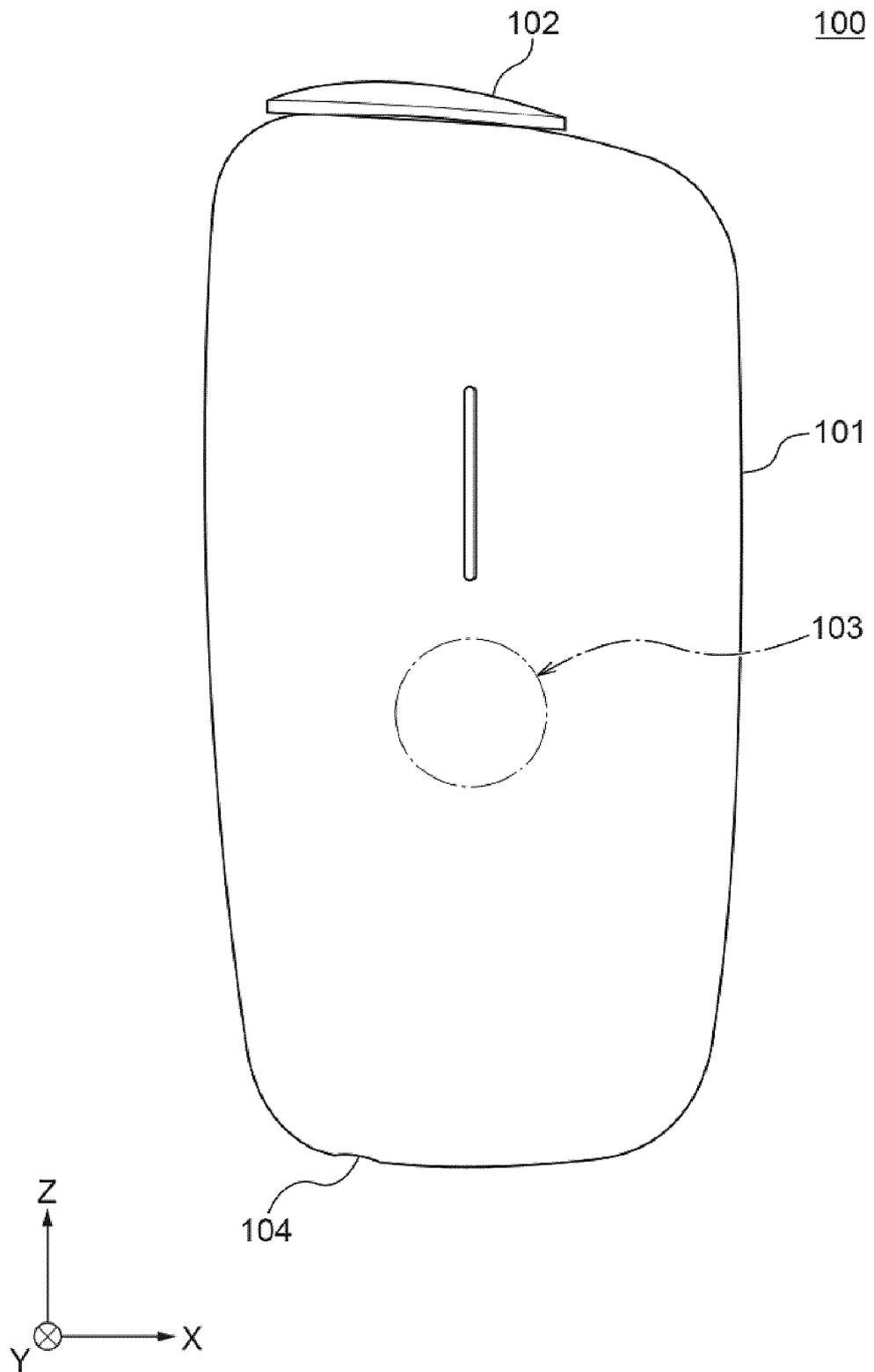


Fig. 1B

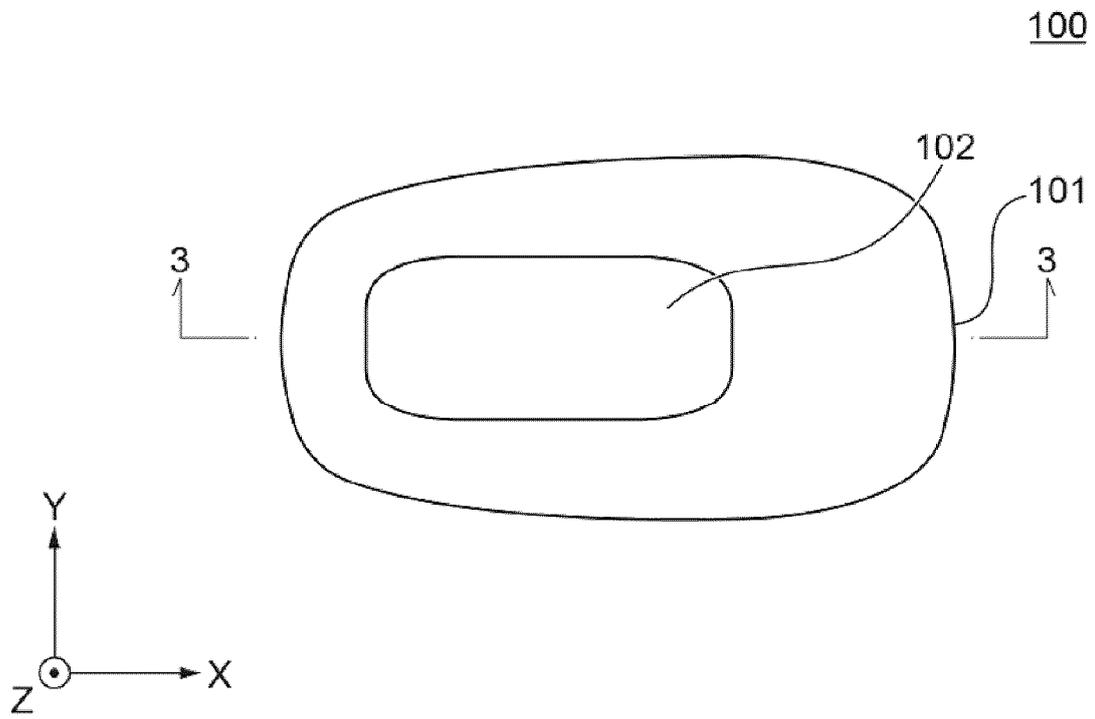


Fig. 1C

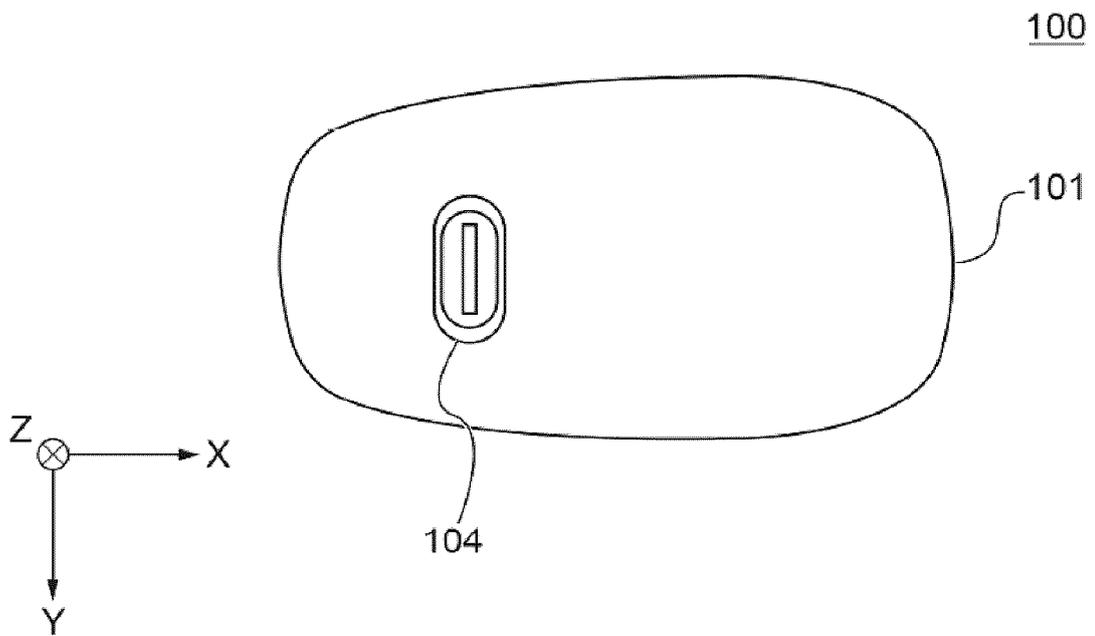


Fig. 2

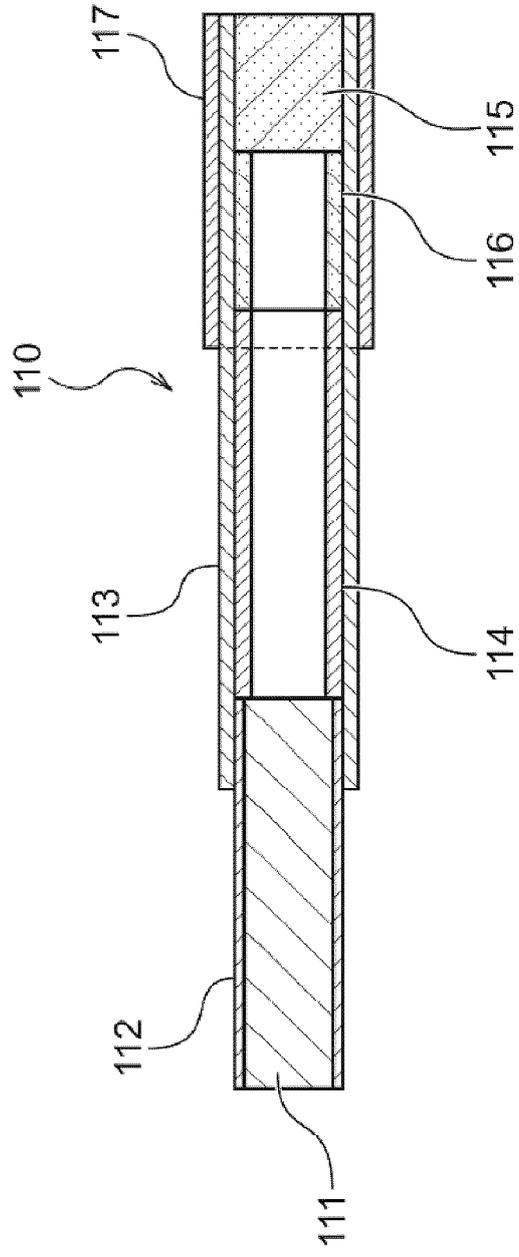


Fig. 3

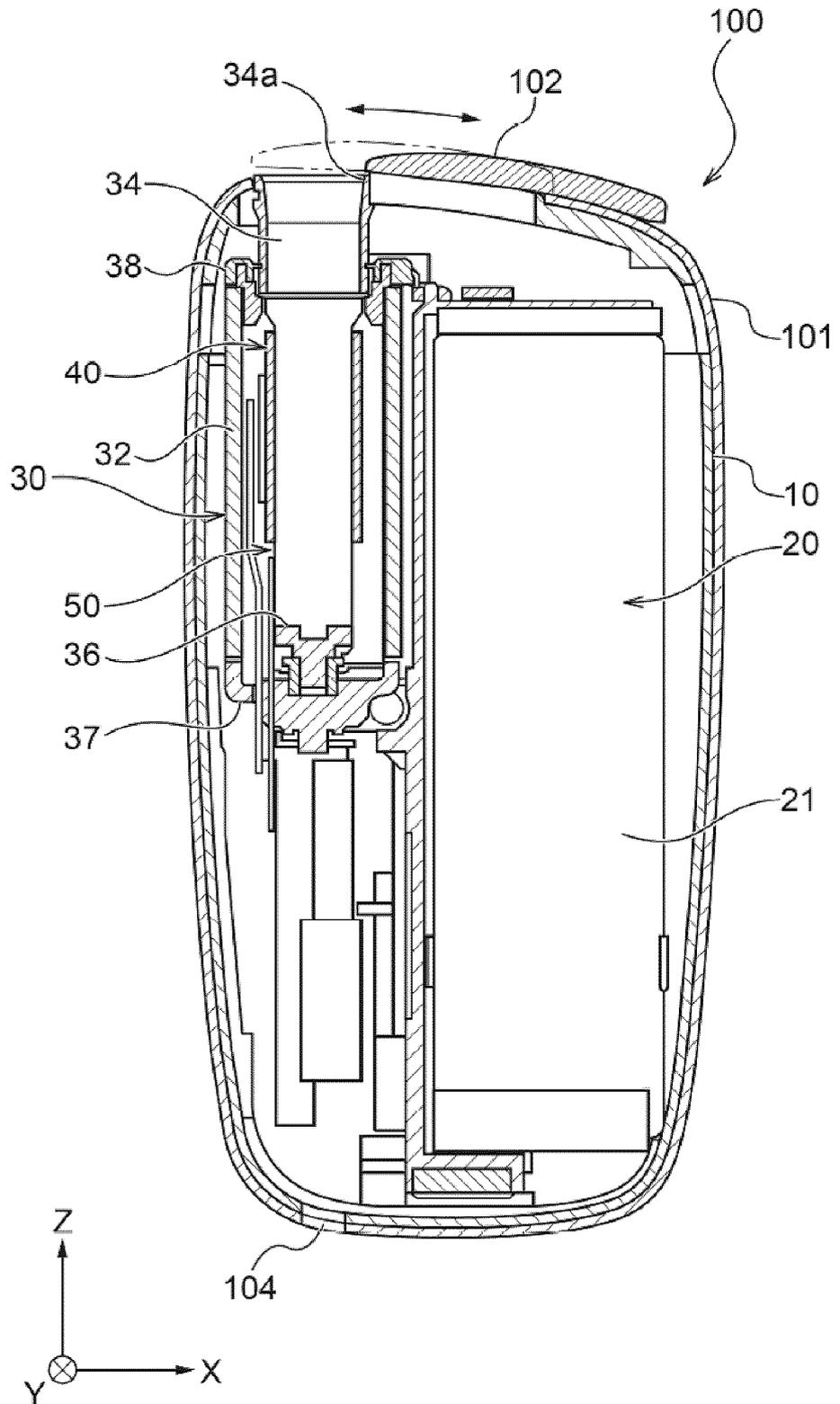


Fig. 4A

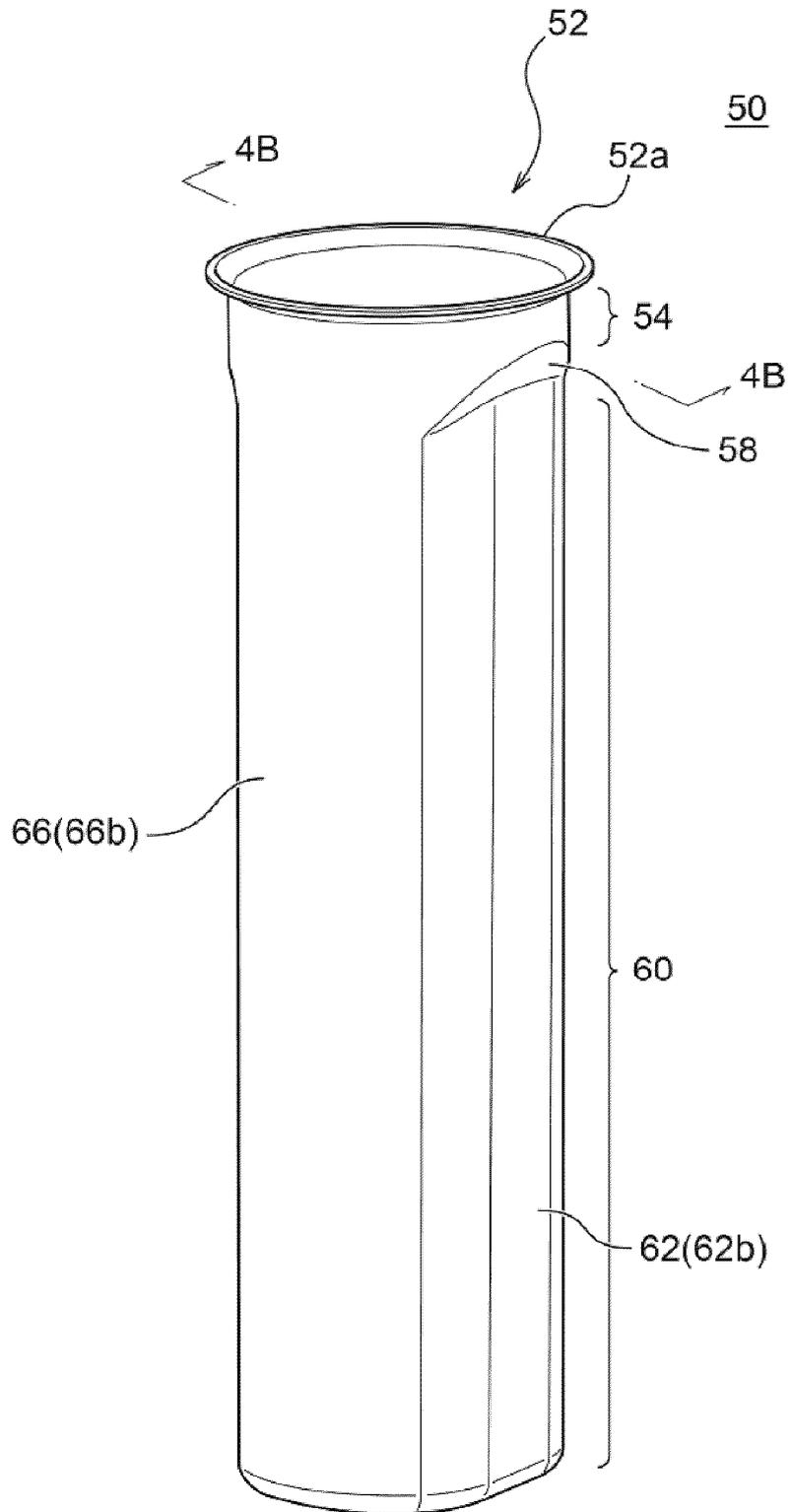


Fig. 4B

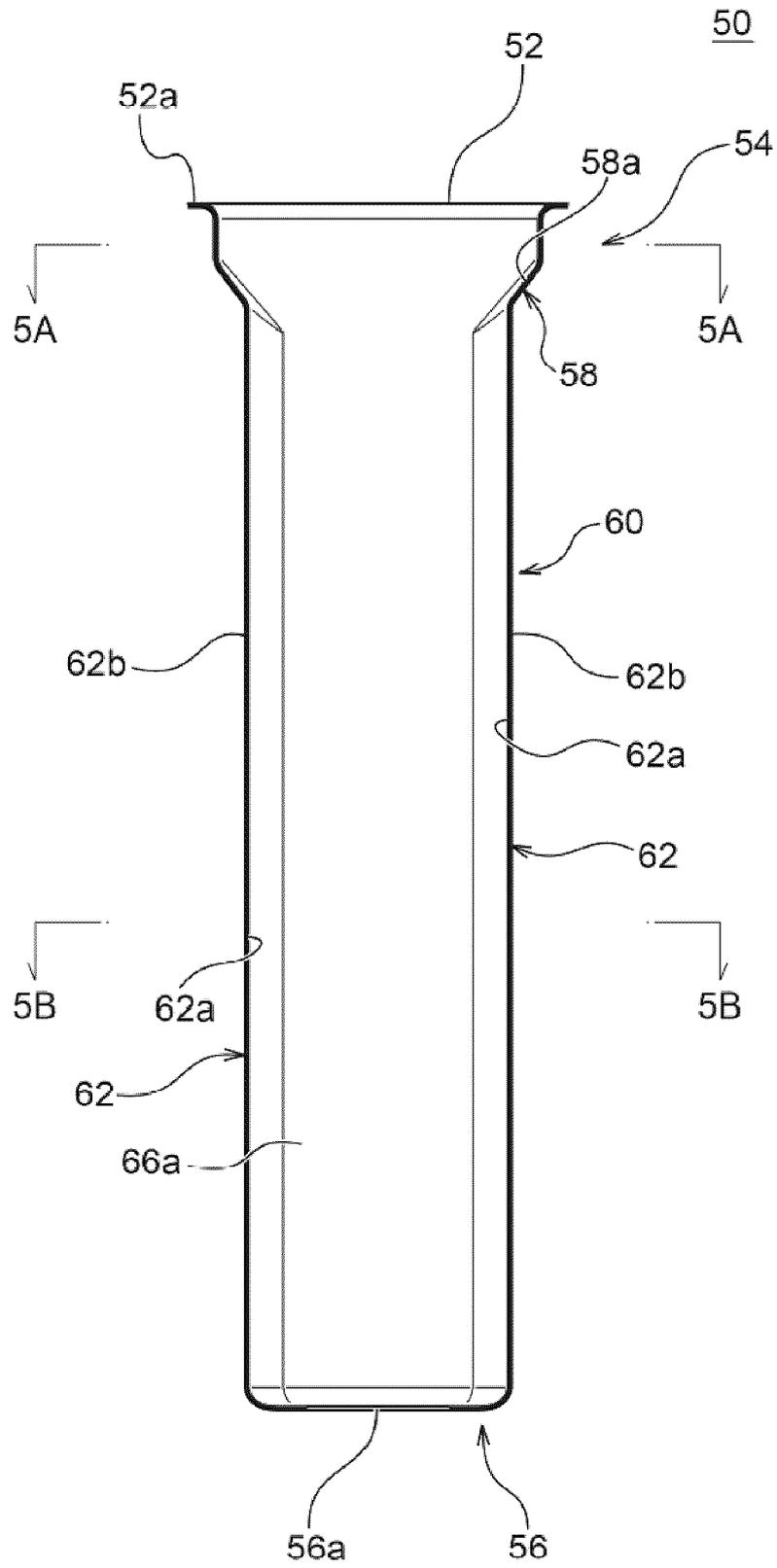


Fig. 5A

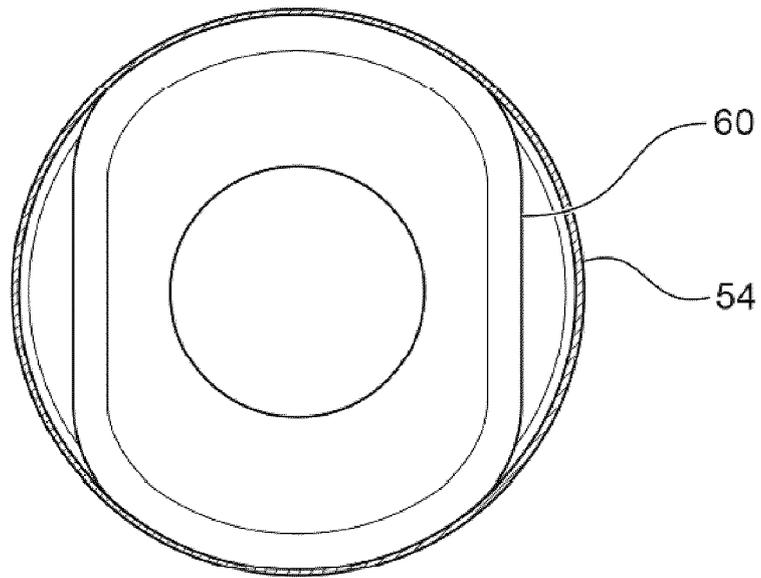


Fig. 5B

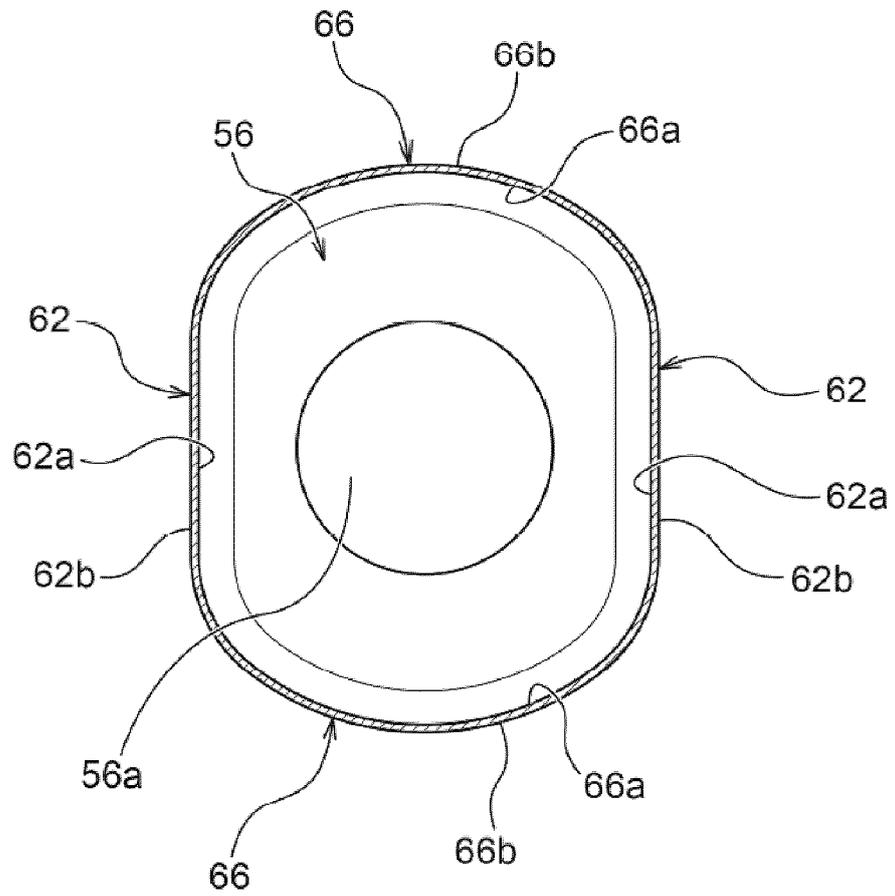


Fig. 6

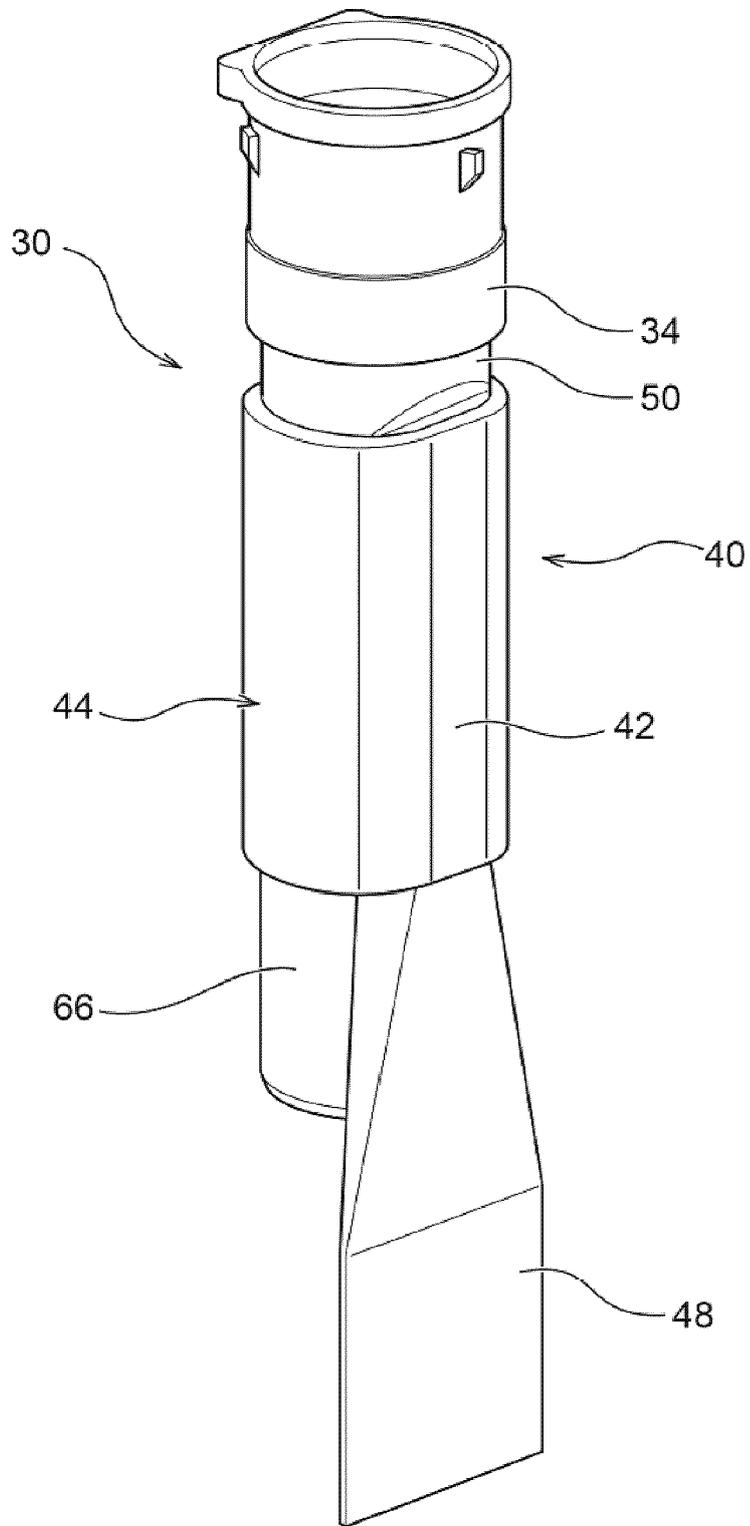


Fig. 7

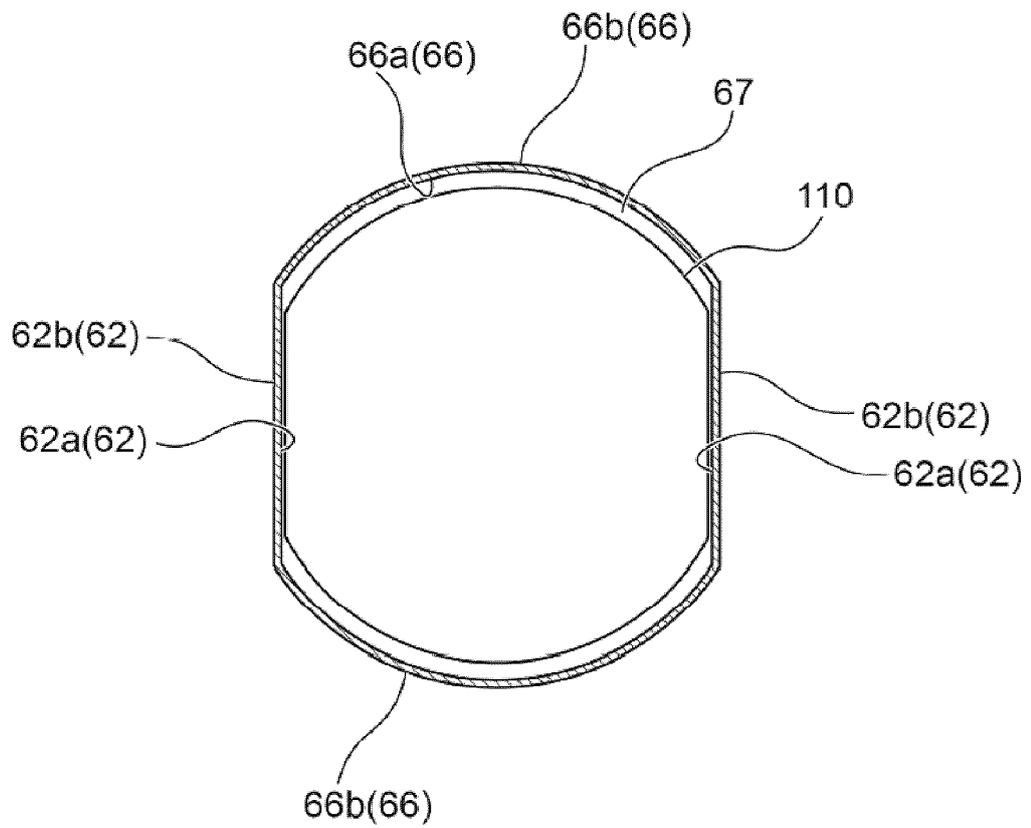


Fig. 8

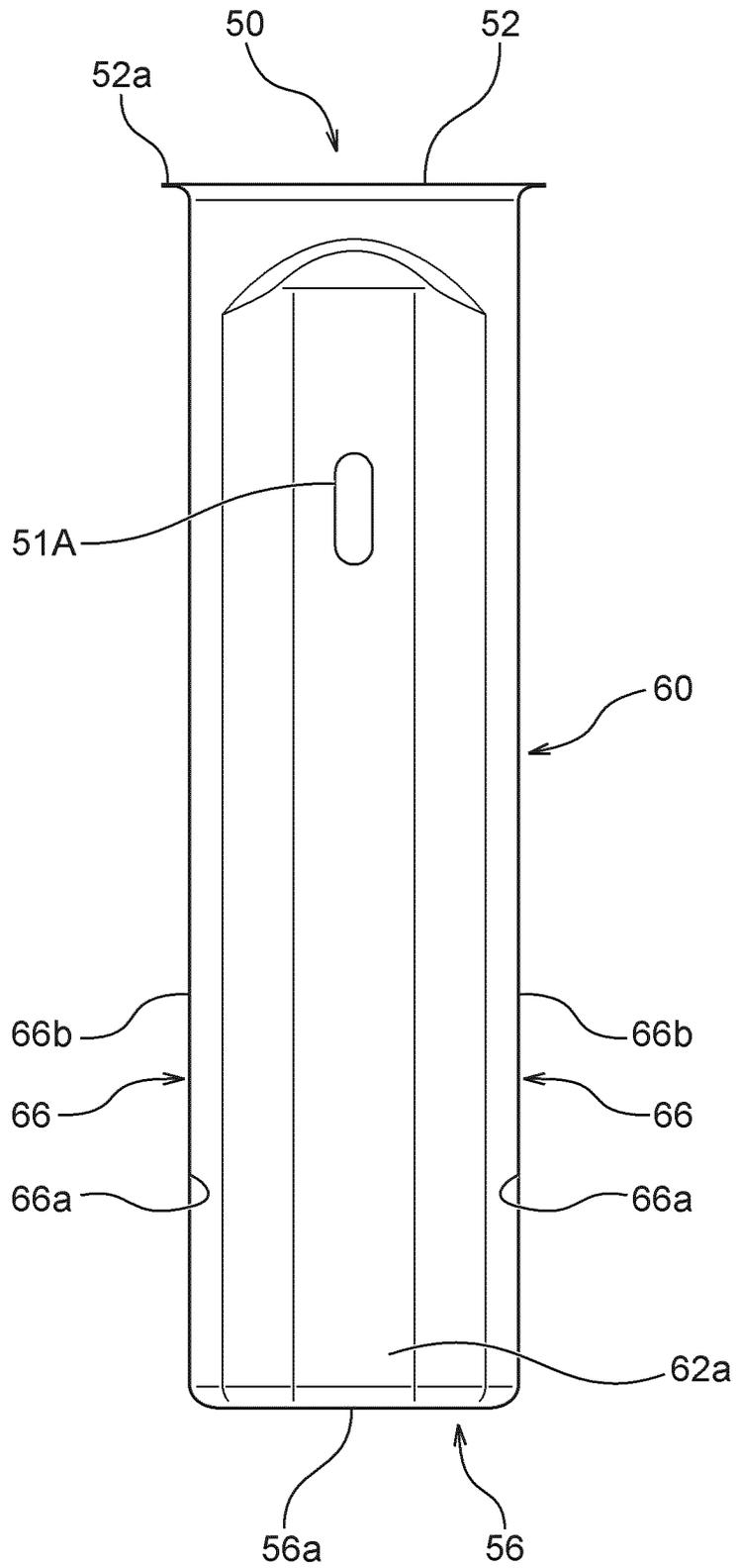


Fig. 9

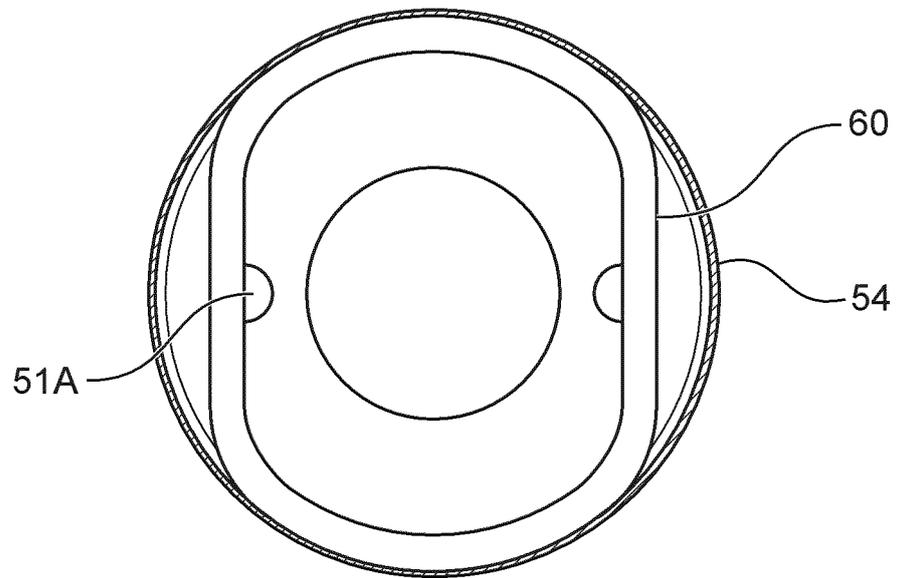


Fig. 10

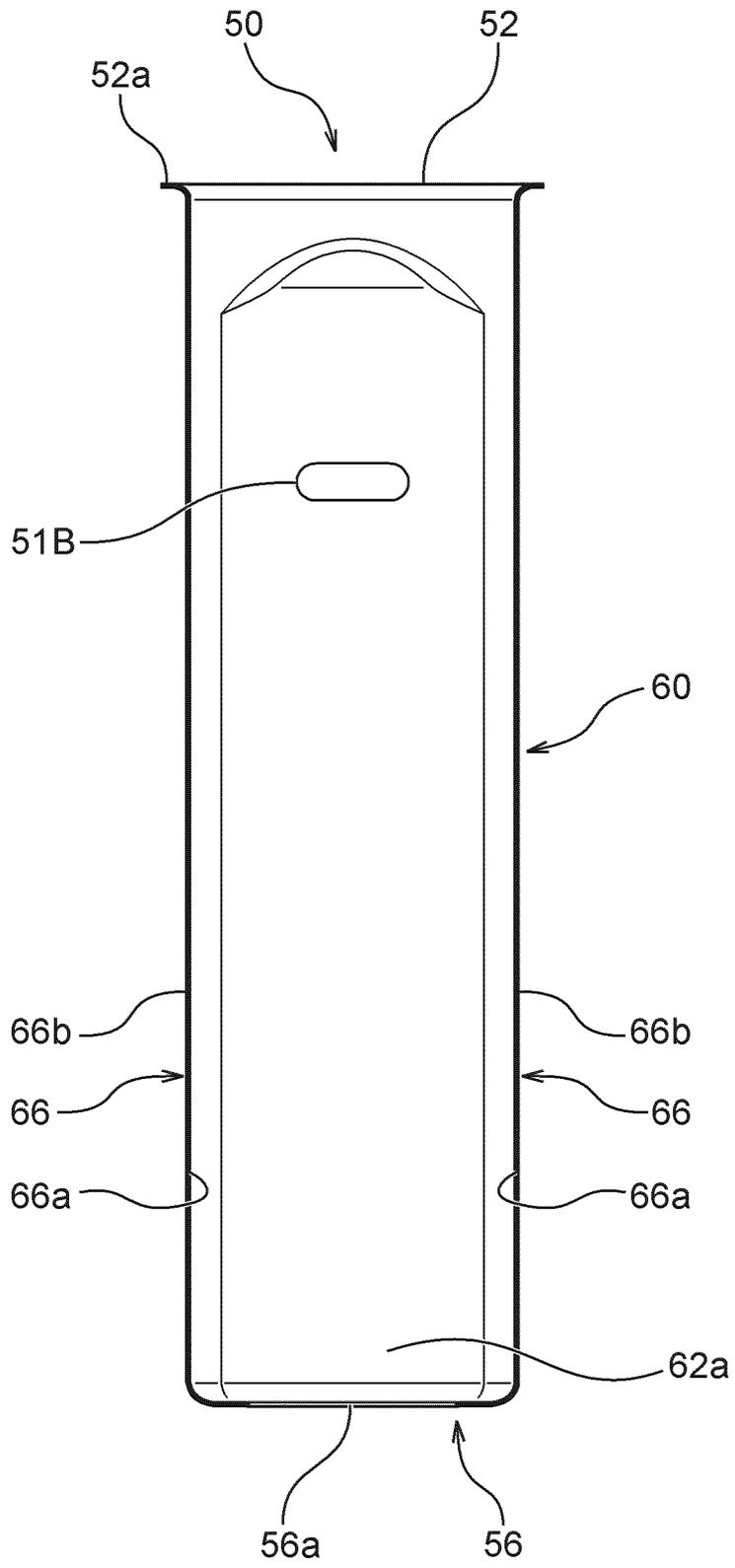


Fig. 11

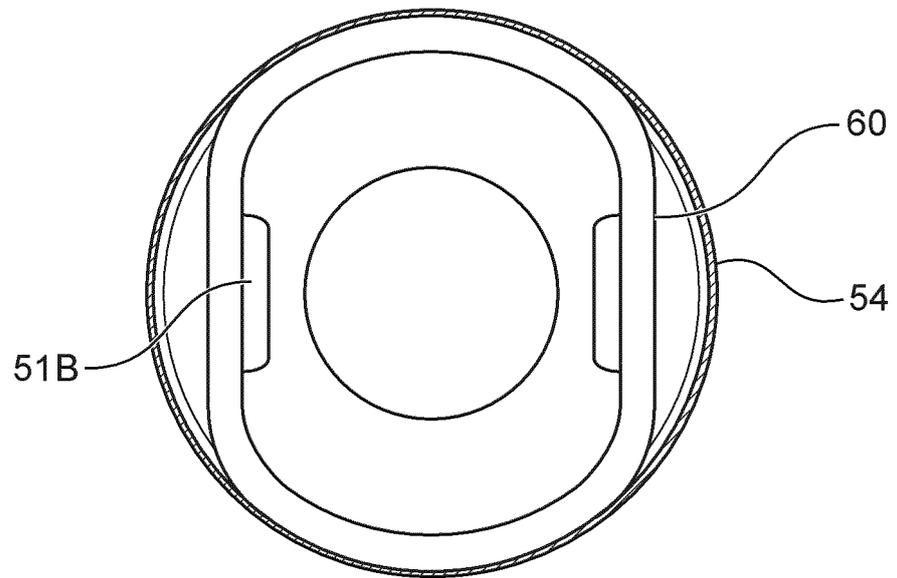


Fig. 12

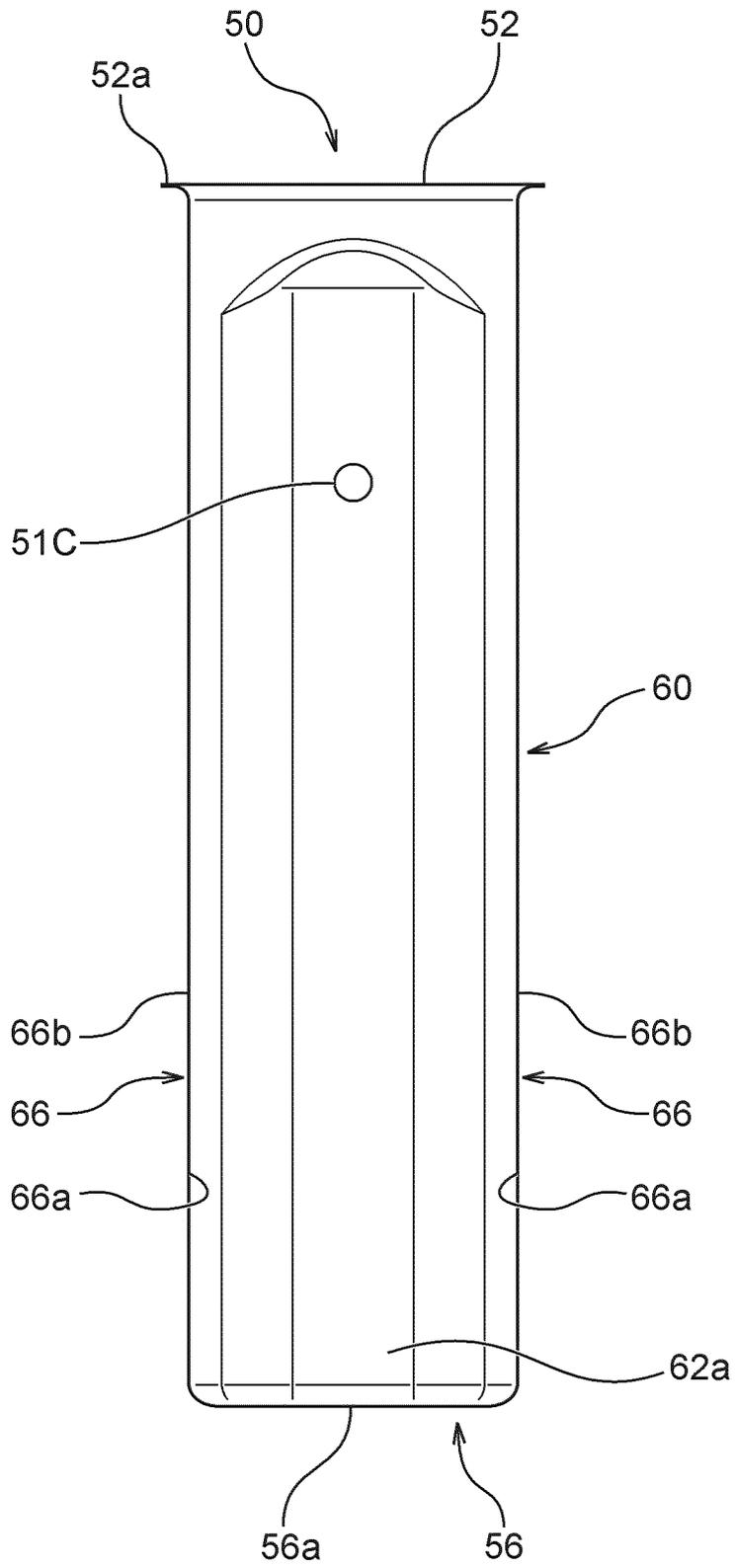


Fig. 13

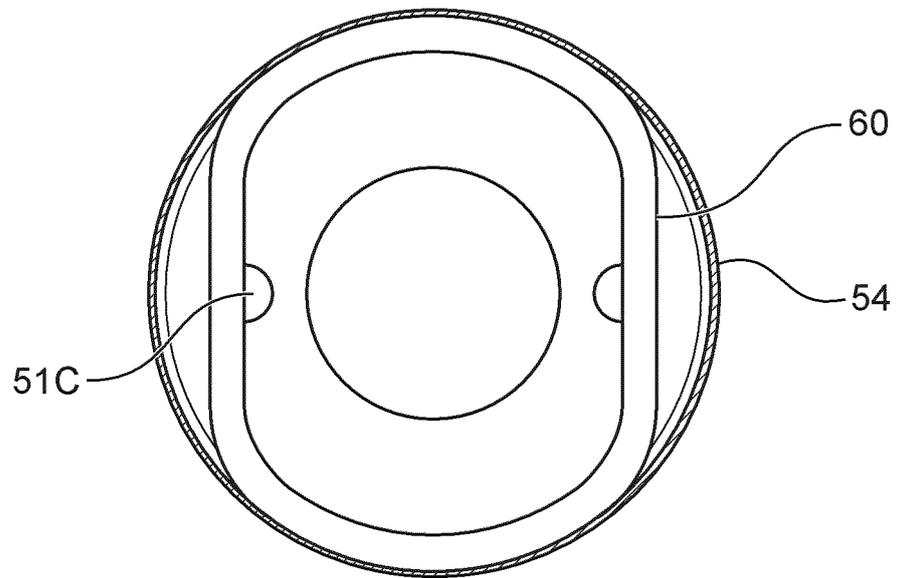


Fig. 14

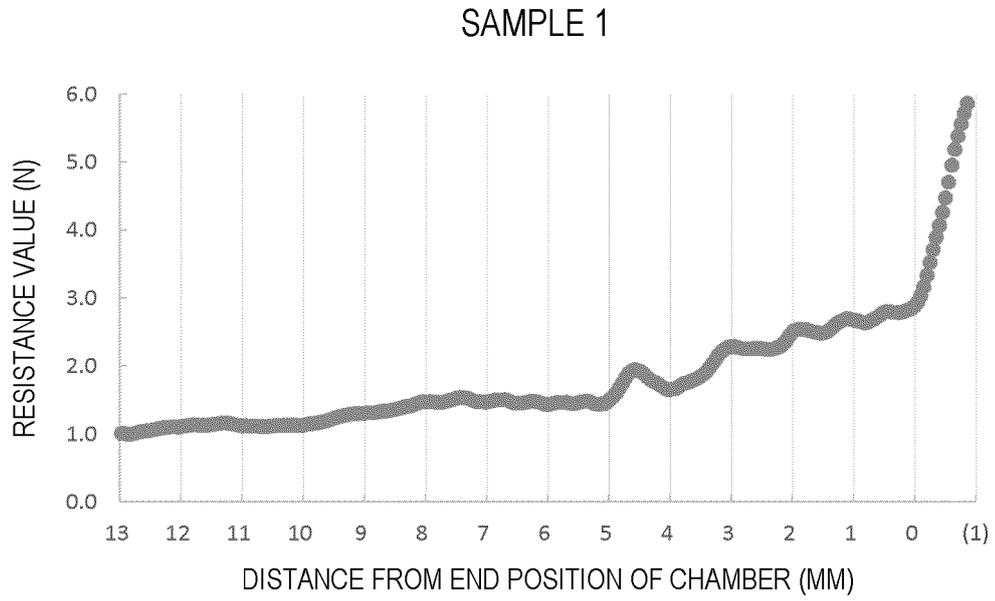


Fig. 15

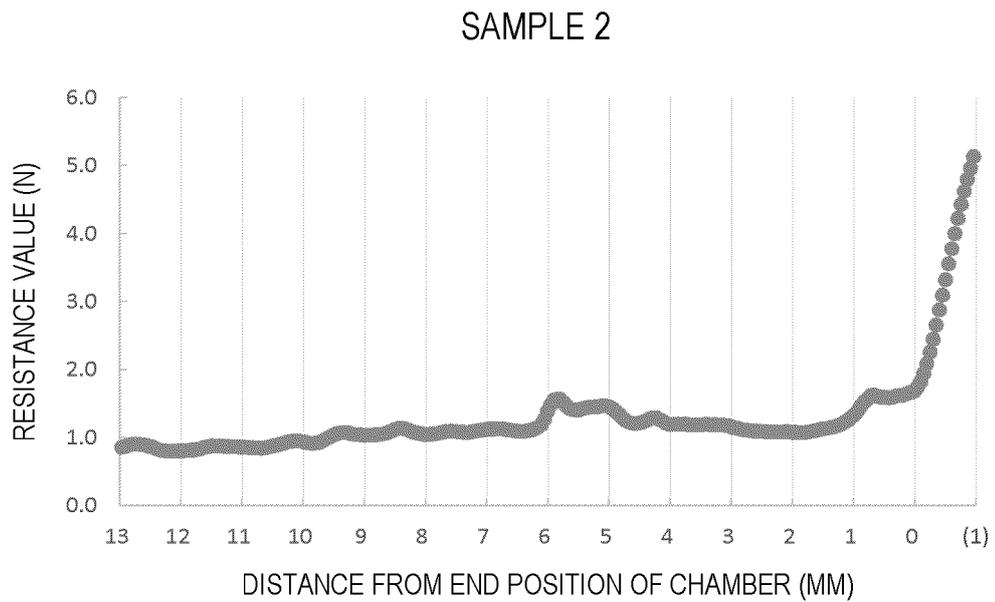


Fig. 16

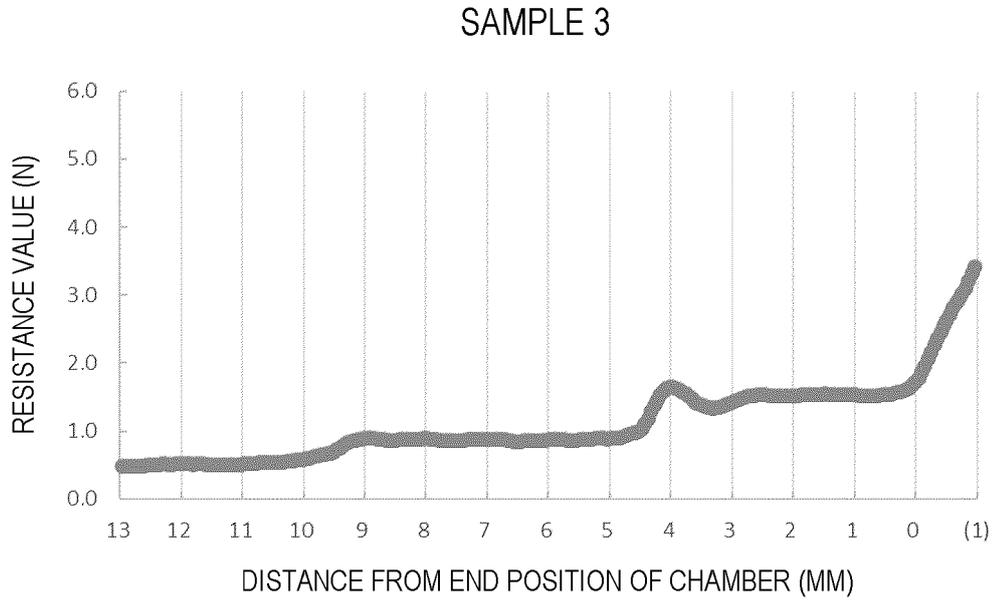


Fig. 17

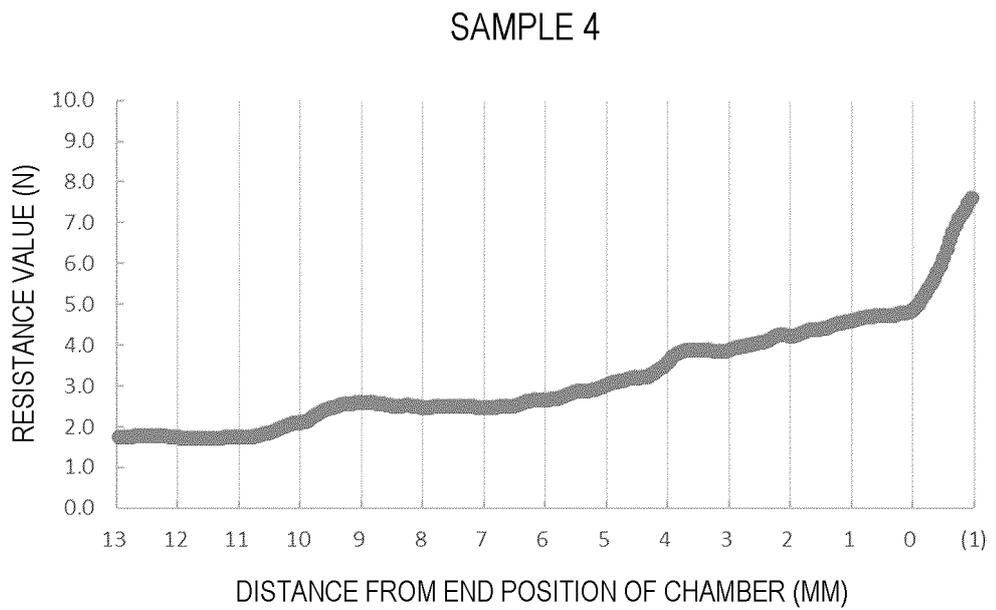


Fig. 18

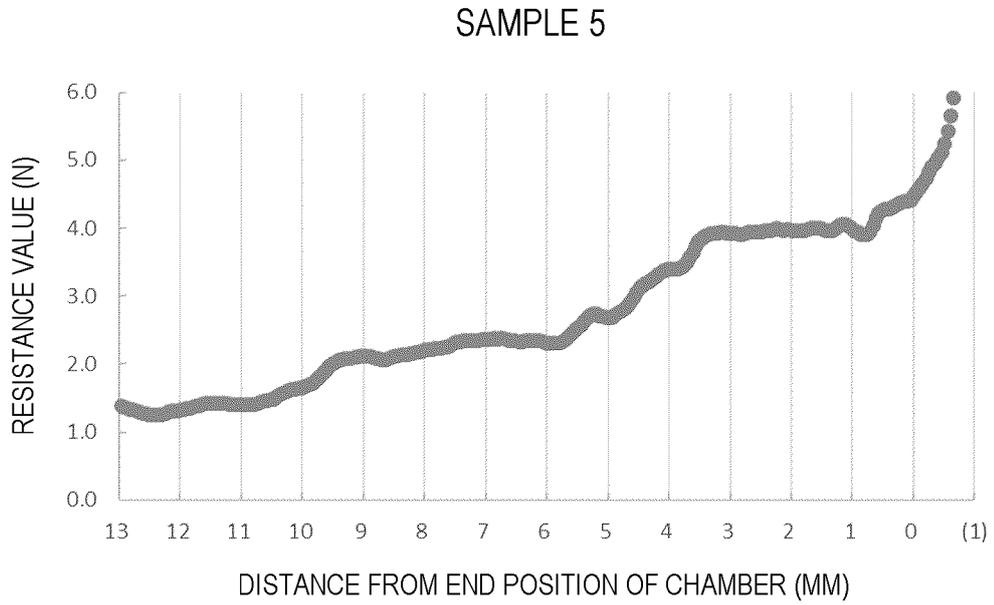
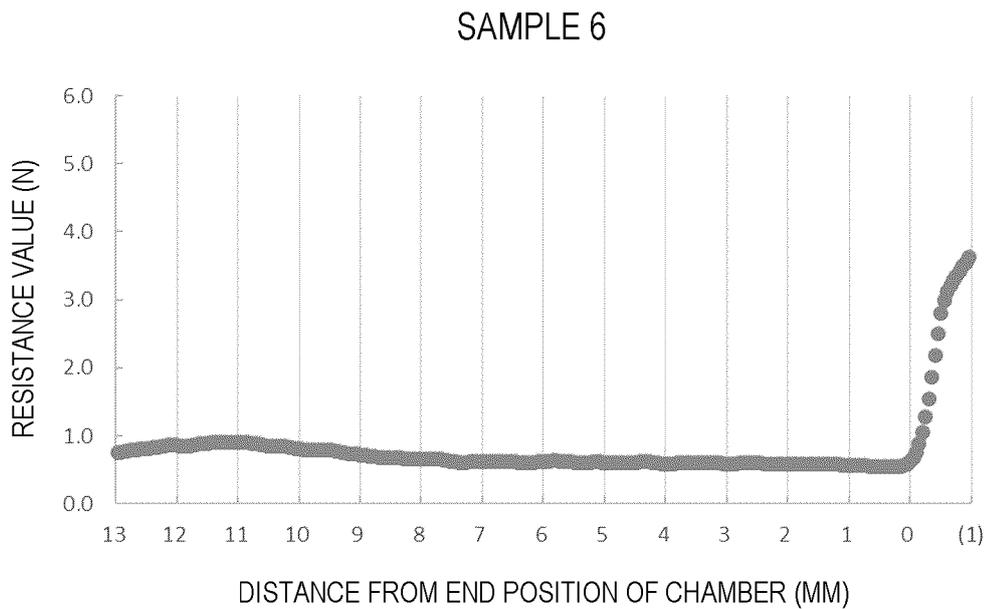


Fig. 19



INTERNATIONAL SEARCH REPORT

International application No.  
PCT/JP2021/016905

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A. CLASSIFICATION OF SUBJECT MATTER A24F 40/40(2020.01)i FI: A24F40/40		
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) A24F40/40		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Published examined utility model applications of Japan	1922-1996	
Published unexamined utility model applications of Japan	1971-2021	
Registered utility model specifications of Japan	1996-2021	
Published registered utility model applications of Japan	1994-2021	
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	JP 2015-519915 A (PHILIP MORRIS PRODUCTS S.A) 16 July 2015 (2015-07-16) paragraphs [0102]-[0138], fig. 1-6	1-4, 8-11 5-7
A	WO 2020/074602 A1 (JT INTERNATIONAL S. A.) 16 April 2020 (2020-04-16) entire text, all drawings	1-11
<input type="checkbox"/> Further documents are listed in the continuation of Box C.		<input checked="" type="checkbox"/> See patent family annex.
* Special categories of cited documents:		
"A"	document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E"	earlier application or patent but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O"	document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"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 02 July 2021 (02.07.2021)	Date of mailing of the international search report 13 July 2021 (13.07.2021)	
Name and mailing address of the ISA/ Japan Patent Office 3-4-3, Kasumigaseki, Chiyoda-ku, Tokyo 100-8915, Japan	Authorized officer  Telephone No.	

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

International application No.  
PCT/JP2021/016905

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WO 2020/074602 A1	16 Apr. 2020		

**REFERENCES CITED IN THE DESCRIPTION**

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