

(12)

# EUROPEAN PATENT APPLICATION

published in accordance with Art. 153(4) EPC

(43) Date of publication:  
**08.05.2024 Bulletin 2024/19**

(51) International Patent Classification (IPC):  
**A24F 40/20** (2020.01)

(21) Application number: **21940009.0**

(52) Cooperative Patent Classification (CPC):  
**A24F 40/20**

(22) Date of filing: **28.06.2021**

(86) International application number:  
**PCT/JP2021/024306**

(87) International publication number:  
**WO 2023/275918 (05.01.2023 Gazette 2023/01)**

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

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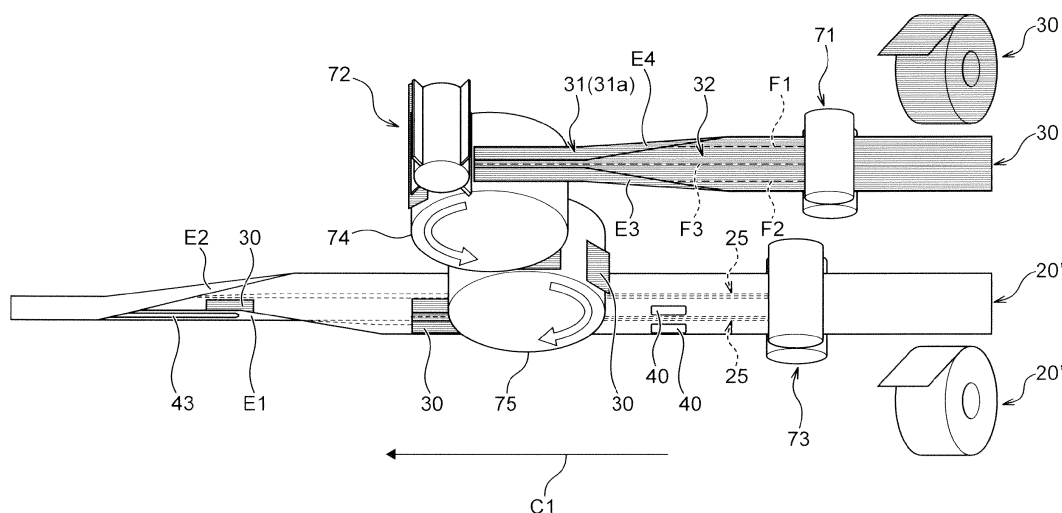
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(54) **METHOD FOR MANUFACTURING CARTRIDGE FOR FLAVOR ASPIRATORS**

(57) Provided is a method for manufacturing a flavor inhaler cartridge that includes a raw material sheet including a base material layer and a raw material layer, and a case accommodating the raw material sheet therein. The method for manufacturing a cartridge includes:

disposing the raw material sheet on a case paper that is a raw material of the case; folding the case paper and thereby folding the raw material sheet along with the case paper; and wrapping the case paper around the raw material sheet.

**Fig. 7**



## Description

### TECHNICAL FIELD

**[0001]** The present invention relates to a method for manufacturing a flavor inhaler cartridge.

### BACKGROUND ART

**[0002]** In the related art, an apparatus for manufacturing a smoking product such as a tobacco rod is known (see PTL 1). PTL 1 discloses manufacturing of a tobacco rod by performing cutting, paper rolling, and the like while transporting a rod using a plurality of transport drums. Also, a flavor inhaler for inhaling a flavor or the like without burning materials is known in the related art. As a smoking product used with such a flavor inhaler, a smoking product including a smoking material made of tobacco containing a volatile component and an aerosol cooling member for cooling a volatilized material (aerosol) before the volatilized material reaches the inside of a mouth of a user is known (see PTL 2).

### CITATION LIST

### PATENT LITERATURE

#### [0003]

PTL 1: Japanese Patent No. 6438063

PTL 2: Japanese Translation of PCT International Application Publication No. 2017-518041

### SUMMARY OF INVENTION

### TECHNICAL PROBLEM

**[0004]** An object of the present invention is to provide a new method for manufacturing a flavor inhaler cartridge.

### SOLUTION TO PROBLEM

**[0005]** According a first aspect, there is provided a method for manufacturing a flavor inhaler cartridge that includes a raw material sheet including a base material layer and a raw material layer, and a case accommodating the raw material sheet therein. The method for manufacturing a cartridge includes: disposing the raw material sheet on a case paper that is a raw material of the case; folding the case paper and thereby folding the raw material sheet along with the case paper; and wrapping the case paper around the raw material sheet.

**[0006]** According to the first aspect, it is possible to reduce the number of processes and to improve productivity of the cartridge as compared with a case where the raw material sheet and the case paper are folded separately and the raw material sheet is then accommodated

in the case.

**[0007]** According to a gist of a second aspect, the base material layer includes a conductive layer containing a material with conductivity and a paper layer laminated on the conductive layer, and the raw material layer is provided on the paper layer in the first aspect.

**[0008]** According to the second aspect, the raw material can include a binder or the like, and it is thus possible to cause the raw material layer to adhere to the paper layer without using an adhesive for bonding the raw material. Also, the base material layer includes a conductive layer, and it is thus possible to improve heat transfer efficiency (heating efficiency) when the raw material layer is used by the flavor inhaler. As a result, delivery efficiency of vapor or aerosols from the raw material is improved when the raw material layer is used, and it is thus possible to reduce the amount of used raw material. Also, in a case where the flavor inhaler includes an induction coil, it is possible to induction-heat the conductive layer with the induction coil. Additionally, it is also possible to improve strength of the raw material layer by the conductive layer.

**[0009]** According to a gist of a third aspect, cutting the raw material sheet in a roll shape into a predetermined length; and disposing the cut raw material sheet on the case paper are further included in the first aspect or the second aspect.

**[0010]** According to the third aspect, it is possible to successively manufacture the raw material sheet with a predetermined length from the raw material sheet in the roll shape, thereby to successively dispose the raw material sheet on the case paper, and to improve productivity of the cartridge.

**[0011]** According to a gist of a fourth aspect, transporting the case paper in a first direction; and disposing the raw material sheet on the case paper that is being transported are further included in any of the first aspect to the third aspect.

**[0012]** According to the fourth aspect, it is possible to successively dispose the raw material sheet on the case paper and thereby to achieve mass production of the cartridge.

**[0013]** According to a gist of a fifth aspect, cutting the case paper along a plane intersecting the first direction is further included in the fourth aspect.

**[0014]** According to the fifth aspect, it is possible to form a cartridge with an arbitrary length.

**[0015]** According to a gist of a sixth aspect, a process of forming a half-cut or a deboss in the case paper; and folding the case paper along the half-cut or the deboss are further included in any of the first aspect to the fifth aspect.

**[0016]** According to the sixth aspect, the material of the case (case paper) is easily folded along the half-cut or the deboss when the case is formed even if the case paper is formed of a material having rigidity to some extent, for example, a cardboard.

**[0017]** According to a gist of a seventh aspect, dispos-

ing the raw material sheet on the half-cut or the deboss of the case paper; and folding the case paper and the raw material sheet together along the half-cut or the deboss are further included in the sixth aspect.

**[0018]** According to the seventh aspect, deviation of the folding position is curbed, and it is possible to fold the case paper and the raw material sheet at an appropriate position.

**[0019]** According to a gist of an eighth aspect, folding a first end portion and a second end portion facing the first end portion of the raw material sheet such that the raw material layer faces itself before disposing the raw material sheet on the case paper; and folding the case paper and thereby folding the raw material sheet along with the case paper such that the base material layer of the raw material sheet faces itself after disposing the raw material sheet on the case paper are further included in any of the first aspect to the seventh aspect.

**[0020]** According to the eighth aspect, it is possible to efficiently heat the raw material layer without bringing a blade or a susceptor of a heating portion into contact with the raw material layer, by heating the raw material sheet with the blade, the susceptor, or the like disposed in a clearance where the base material layer faces itself. In this manner, contamination of the blade or the susceptor due to the raw material layer is curbed, and it is possible to reduce the frequency of cleaning of the heating blade or the susceptor. Also, the clearance where the raw material layer faces itself defines an air flow path, and aerosols generated from the raw material layer can thus pass through the clearance. It is thus possible to efficiently deliver the aerosols generated from the raw material layer toward the downstream side.

**[0021]** According to a gist of a ninth aspect, applying an adhesive to the case paper; and disposing the raw material sheet on the case paper such that the base material layer comes into contact with the adhesive applied to the case paper are further included in any of the first aspect to the eighth aspect.

**[0022]** According to the ninth aspect, adhesion of the adhesive to the raw material layer is curbed, and it is thus possible to curb an influence of the adhesive on smoking taste.

#### BRIEF DESCRIPTION OF DRAWINGS

##### **[0023]**

Fig. 1 is a schematic side view of a flavor inhaler in which a cartridge is used according to the present embodiment.

Fig. 2 is a perspective view of the cartridge.

Fig. 3 is a partially enlarged sectional view of a raw material sheet.

Fig. 4 is a diagram illustrating an example of a section of the raw material sheet in a state in which the raw material sheet is accommodated in a case.

Fig. 5 is a diagram illustrating another example of

the section of the raw material sheet in the state in which the raw material sheet is accommodated in the case.

Fig. 6 is a side view of the cartridge seen from a second opening.

Fig. 7 is a schematic view illustrating a process for manufacturing the cartridge.

Fig. 8 is a schematic view illustrating an example of a cut location of a case paper.

Fig. 9 is a schematic view illustrating a process for accommodating the raw material sheet and a cooling portion in a case.

Fig. 10 is a schematic view illustrating an example of the cut location of the case paper.

Fig. 11 is a schematic view illustrating a process for accommodating the raw material sheet and separated parts in a case.

Fig. 12 is a schematic view illustrating an example of cut locations of the case paper.

Fig. 13 is a schematic plan view of the cartridge formed by being cut at the cut locations illustrated in Fig. 12.

#### DESCRIPTION OF EMBODIMENTS

**[0024]** Hereinafter, embodiments of the present invention will be described with reference to the drawings. The same reference signs will be applied to the same or corresponding components in the drawings which will be described below, and repeated description will be omitted.

**[0025]** Fig. 1 is a schematic side view of a flavor inhaler in which a cartridge is used according to the present embodiment. A flavor inhaler 100 according to the present embodiment is configured to generate aerosols including flavor through heating of a cartridge 10. As illustrated in the drawing, the flavor inhaler 100 includes a housing 100, a battery 140 disposed inside the housing 110, a heating portion 150, and a control circuit 170. An end portion of the housing 110 of the flavor inhaler 100 on the side of the heating portion 150 opens, such that the cartridge 10 can be inserted into the heating portion 150.

**[0026]** The battery 140 is configured to supply power to the heating portion 150, the control circuit 170, and the like. For example, the battery 140 is a lithium ion battery. The battery 140 may be able to be charged by an external power source.

**[0027]** The heating portion 150 can include a heating blade adapted to be inserted into the cartridge 10. In other words, the heating portion 150 may be a heater of an internal heating type that heats the cartridge 10 from the inside. The heating blade includes a substrate of a resin, for example, and a heating track formed on a surface of the substrate and can have a thickness of about 0.5 mm, for example. Also, the heating portion 150 may include an induction coil for induction-heating a susceptor. The susceptor may be provided in the flavor inhaler 100 or may be provided in the cartridge 10. For example, the

flavor inhaler 100 may include a susceptor to be inserted into the cartridge 10 when the cartridge 10 is disposed at the heating portion 150. Alternatively, the cartridge 10 may include a conductive material that is induction-heated by the induction coil. Note that the flavor inhaler 100 illustrated in Fig. 1 may include an electromagnetic shield (not illustrated) that curbs arrival of electromagnetic waves generated by the induction coil at the control circuit 170 between the heating portion 150 and the control circuit 170. The heating portion 150 is configured to heat the cartridge 10 to not less than 200°C and not more than 350°C, for example.

**[0028]** The control circuit 170 is configured of a CPU, a memory, and the like and controls operations of the flavor inhaler 100. For example, the control circuit 170 starts heating of the cartridge 10 in response to a user's operation on an input device such as a press button or a slide-type switch, which is not illustrated, and ends the heating of the cartridge 10 after a specific period of time elapses. The control circuit 170 may end the heating of the cartridge 10 even before the specific period of time elapses from the start of the heating of the cartridge 10 in a case in which the number of times the user performs a puffing action exceeds a specific value. For example, the puffing action is detected by a sensor, which is not illustrated.

**[0029]** Alternatively, the control circuit 170 may start the heating of the cartridge 10 in response to a start of the puffing action and end the heating of the cartridge 10 in response to an end of the puffing action. The control circuit 170 may end the heating of the cartridge 10 even before the puffing action is ended, in a case in which a specific period of time elapses after the start of the puffing action. In the illustrated example, the control circuit 170 is disposed between the battery 140 and the heating portion 150 and curbs heat transmission from the heating portion 150 to the battery 140.

**[0030]** The cartridge 10 generates vapor and aerosols of an aerosol source or a flavor source by being heated by the heating portion 150. The vapor and the aerosols generated inside the cartridge 10 is cooled by passing through the cartridge 10 and then reaches the inside of a user's mouth. The vapor generated in the cartridge 10 can be cooled by passing through the cartridge 10 and can be changed into aerosol particles. In the present embodiment, the cartridge 10 has a flat shape. Also, the cartridge 10 has a thin plate shape or a card shape in a state in which the heating portion 150 is inserted.

**[0031]** The flavor inhaler 100 may include a mouthpiece. In this case, the flavor inhaler 100 is configured to accommodate the cartridge 10 therein, and the vapor or the aerosols generated by the cartridge 10 is supplied to the user through the mouthpiece.

**[0032]** Next, details of the cartridge 10 will be described. Fig. 2 is a perspective view of the cartridge 10. The cartridge 10 includes a raw material sheet 30 that is heated and thereby generates aerosols and a case 20 that accommodates the raw material sheet 30 therein.

The cartridge 10 illustrated in Fig. 2 does not include a filter and includes only the raw material sheet 30. In other words, since the cartridge 10 has a simple configuration, it is easy to continuously manufacture the cartridge 10, and it is possible to relatively reduce the weight of waste of the cartridge 10 after use.

**[0033]** The case 20 has a thin substantially tubular shape and includes a first wall 20a, a second wall 20b, and a pair of connecting walls 20c. The first wall 20a is a wall having the largest plane of the case 20. The second wall 20b faces the first wall 20a. The pair of connecting walls 20c connect the first wall 20a to the second wall 20b. Specifically, one of the connecting walls 20c extends between one end of the first wall 20a and one end of the second wall 20b, and the other one of the connecting walls 20c extends between the other end of the first wall 20a and the other end of the second wall 20b. Therefore, the substantially tubular case 20 is formed by the first wall 20a, the second wall 20b, and the pair of connecting walls 20c, and one or more air flow paths through which the aerosols pass as will be described later are provided inside the case 20.

**[0034]** Also, the case 20 includes a first opening 21, a second opening 22 that faces the first opening 21, a first end surface 21a that is provided with the first opening 21, and a second end surface 22a that is provided with the second opening 22. The first opening 21 and the second opening 22 are defined by the first wall 20a, the second wall 20b, and the pair of connecting walls 20c. The heating blade of the heating portion 150 or the susceptor described above can be inserted into the second opening 22. The first opening 21 and the second opening 22 can have substantially the same opening shapes. The inside of the case 20 on the side of the first end surface 21a is hollow, such that the aerosols directed from the raw material sheet 30 toward the first opening 21 can pass through the hollow.

**[0035]** The thickness of the case 20 (the length between the outer side surface of the first wall 20a and the outer side surface of the second wall 20b) can range from about 1.5 mm to about 6.0 mm, for example. The length of the case 20 (the length between the first end surface 21a and the second end surface 22a) is equal to or greater than 50 mm and equal to or less than 100 mm, for example. The width of the case 20 (the length that is orthogonal to the thickness direction and the length direction) is, for example, about 12 mm. The case 20 can be formed of a predetermined cardboard, for example. Specifically, the case 20 can be formed of a paper with a paper weight of equal to or greater than 80 g/m<sup>2</sup> and equal to or less than 300 g/m<sup>2</sup>, for example.

**[0036]** It is possible to remove the cartridge 10 from the heating portion 150 without the user directly touching the raw material sheet 30 at a high temperature after use, by the raw material sheet 30 being accommodated in the case 20. Also, it is possible to maintain the shape of the raw material sheet 30, which is relatively easily deformed, by the raw material sheet 30 being accommodated in the

case 20, and the size of a first clearance 33 and a second clearance 34 included in the raw material sheet 30, which will be described later, is easily maintained to be constant. Furthermore, it is possible to absorb a part of vapor or aerosols generated from the raw material sheet 30 by the case 20 being formed of a paper and to curb condensation of the vapor or the aerosols inside the flavor inhaler 100.

**[0037]** A metal foil such as aluminum may be provided on the inner surface of the case 20. In this manner, it is possible to curb heat dissipation due to thermal radiation of the heating portion 150 and the raw material sheet 30 heated by the heating portion 150 and to efficiently heat the raw material sheet 30. Specifically, a part of the case 20 where the raw material sheet 30 is disposed (that is, a part where the heating portion 150 is located) is not provided with the metal foil, and the metal foil can be provided on the inner surface of the case 20 on the side further downstream than the part. It is thus possible to promote cooling of vapor generated by the raw material sheet 30, that is, formation of aerosols. Note that if the metal foil is also provided on the inner surface of the case 20 at the part where the raw material sheet 30 is disposed, heat of the raw material sheet 30 is transferred to the downstream side through the metal foil, and there is thus a concern that it is not possible to sufficiently cool the vapor on the downstream side of the raw material sheet 30. On the other hand, the part of the case 20 where the raw material sheet 30 is disposed (that is, the part where the heating portion 150 is located) may also be provided with the metal foil. In this case, the heat of the heating portion 150 is transferred to the inner surface of the case 20 on the downstream side due to the metal foil continuing from the part where the raw material sheet 30 is disposed (that is the part where the heating portion 150 is located) to the downstream side thereof, and condensation of the vapor or the aerosols to the inner surface of the case 20 can be curbed.

**[0038]** The raw material sheet 30 in the present embodiment includes a sheet having a plurality of folding lines. Fig. 3 is a partially enlarged sectional view of the raw material sheet 30. As illustrated in the drawing, the raw material sheet 30 includes a base material layer 31 and a raw material layer 32. In the present embodiment, the base material layer 31 includes a conductive layer 31a containing a material with conductivity and a paper layer 31b laminated on the conductive layer 31a. Specifically, the base material layer 31 can be a metal attached paper formed by attaching the conductive layer 31a to the paper layer 31b. As the material with conductivity, it is possible to use a known material such as aluminum, stainless steel, carbon, iron, an alloy containing iron, an alloy containing iron and nickel, an alloy containing iron, nickel, and chromium, an alloy containing iron, nickel, chromium, and manganese, an alloy containing iron, nickel, chromium, manganese, and silicon, for example. It is possible to efficiently transfer the heat of the heating portion 150 to the raw material layer 32 by the base ma-

terial layer 31 including the conductive layer 31a. Moreover, it is also possible to use the conductive layer 31a as a susceptor for induction heating by the base material layer 31 including the conductive layer 31a. As illustrated in the drawing, the raw material layer 32 is provided on the paper layer 31b of the base material layer 31 in the raw material sheet 30 according to the present embodiment. It is thus possible to cause the raw material layer 32 to adhere to the base material layer 31 without using any adhesive as will be described later. Although the base material layer 31 includes the conductive layer 31a in the present embodiment, the present invention is not limited thereto, and the base material layer 31 may not include the conductive layer 31a.

**[0039]** The paper layer 31b can be a paper such as a pulp paper, for example. Also, the paper layer 31b can include a fiber layer, such as a non-woven fabric, that does not contain tobacco fiber in the present embodiment. Although the paper layer 31b can have an arbitrary thickness, the thickness is preferably equal to or greater than 0.03 mm and equal to or less than 0.15 mm. If the thickness of the paper layer 31b falls within this range, it is possible to efficiently heat the raw material sheet 30 in the flavor inhaler 100 while securing strength of the raw material sheet 30. If the thickness of the paper layer 31b is less than 0.03 mm, the strength of the raw material sheet 30 decreases, and the raw material sheet 30 may become likely to be torn. Also, if the thickness of the paper layer 31b exceeds 0.15 mm, the paper layer 31b becomes excessively thick, the heat of the heating portion 150 in the flavor inhaler 100 is used for heating the paper layer 31b, and heating efficiency of the raw material sheet 30 may be degraded.

**[0040]** Also, although the paper layer 31b can have arbitrary paper weight, the paper weight is preferably equal to or greater than 20 g/m<sup>2</sup> and equal to or less than 100 g/m<sup>2</sup>. If the paper weight of the paper layer 31b falls within this range, it is possible to efficiently heat the raw material sheet 30 in the flavor inhaler 100 while securing the strength of the raw material sheet 30. If the paper weight of the paper layer 31b is less than 20g/m<sup>2</sup>, the strength of the raw material sheet 30 decreases, and the raw material sheet 30 may become likely to be torn. Also, if the paper weight of the paper layer 31b exceeds 100 g/m<sup>2</sup>, the heat of the heater in the flavor inhaler 100 is used for heating the paper layer 31b, and heating efficiency of the raw material sheet 30 may be degraded. The paper weight of the paper layer 31b is more preferably equal to or greater than 30 g/m<sup>2</sup> and equal to or less than 50 g/m<sup>2</sup>.

**[0041]** The thickness of the conductive layer 31a is preferably equal to or greater than 5 μm and equal to or less than 30 μm. If the thickness of the conductive layer 31a falls within this range, it is possible to exhibit appropriate heat transfer while reducing the amount of used conductive material. Also, the conductive layer 31a can function as an appropriate susceptor at the time of induction heating performed by the induction coil of the heating

portion 150 in the flavor inhaler 100. Furthermore, it is possible to curb an excessive increase in resistance at the time of cutting or bending of the raw material sheet 30. The thickness of the conductive layer 31a is more preferably equal to or greater than 5  $\mu\text{m}$  and equal to or less than 15  $\mu\text{m}$  and specifically can be about 10  $\mu\text{m}$ .

**[0042]** The raw material layer 32 is not bonded to the base material layer 31 via an adhesive such as a glue and can be formed integrally with the base material layer 31 by being applied to the paper layer 31b of the base material layer 3. Although the raw material layer 32 may be bonded to the base material layer 31 via an adhesive such as a glue, bonding with no intervention of an adhesive is preferable in terms of a smoking taste and simplification of the process for manufacturing the raw material sheet 30. The raw material layer 32 can contain, for example, tobacco (corresponding to an example of a flavor source) and a polyhydric alcohol (corresponding to an example of an aerosol source). The polyhydric alcohol can include glycerin, propylene glycol, sorbitol, xylitol, and erythritol. One of these polyhydric alcohols may be used alone, or two or more kinds thereof may be used in combination, for the raw material layer 32. Specifically, the raw material layer 32 can be formed by mixing a binder into powder tobacco and a polyhydric alcohol, applying the mixture to the paper layer 31b of the base material layer 31, and then evaporating a part of moisture thereof. As the binder, it is possible to use, for example, guar gum, xanthan gum, carboxy methyl cellulose (CMC), a sodium salt of carboxy methyl cellulose (CMC-Na), pululan and hydroxypropyl cellulose (HPC), methyl cellulose, or hydroxyl methyl cellulose.

**[0043]** Also, pulp may be added to the raw material layer 32. The pulp can improve strength of the raw material layer 32. However, pulp may not be added to the raw material layer 32 when there is no need to improve the strength of the raw material layer 32. In a case in which pulp is not used, the proportion of the tobacco in the raw material layer 32 increases by the corresponding amount, and an improvement in smoke tastes is thus expected.

**[0044]** Although the binder can be added to the raw material layer 32 for the purpose of controlling appropriate application of the raw materials, the binder may not be added. The percentage by weight of the binder that can be added to the raw material layer 32 is preferably equal to or greater than 0% and equal to or less than 60% and is more preferably equal to or greater than 0% and equal to or less than 10% with respect to the weight of the raw material layer 32, for example.

**[0045]** The raw material layer 32 can have blending rates (percentages by weight) of 5% to 40% of polyhydric alcohol, 50% to 90% of tobacco, 0% to 10% of binder, and 0% to 10% of pulp, for example. Also, an acid such as lactic acid, palmitic acid, or benzoic acid may be added to the raw material layer 32.

**[0046]** Also, the raw material sheet 30 preferably has a tensile strength of equal to or greater than 3.0 N/15

mm, more preferably has a tensile strength of equal to or greater than 5.0 N/15 mm, and further preferably has a tensile strength of equal to or greater than 10 N/15 mm in terms of the manufacturing. Note that the tensile strength of the raw material sheet 30 can be measured by performing a dry tensile strength test (ISO 1924-2) on a test piece of 250 mm  $\times$  15 mm. It is possible to easily fold the raw material sheet 30 when the raw material sheet 30 is manufactured as will be described later and to curb breaking of the raw material sheet 30, by the raw material sheet 30 having the above tensile strength.

**[0047]** Even if the base material layer 31 does not include the paper layer 31b, it is possible to select types and blending rates of raw materials such that the raw material layer 32 can be applied to the conductive layer 31a of the base material layer 31. On the other hand, it is possible to improve fixability of the raw material layer 32 to the base material layer 31 by the base material layer 31 including the paper layer 31b as described above. Specifically, appropriate application and adhesiveness of the raw material layer 32 to the base material layer 31 can be improved by the base material layer 31 including the paper layer 31b. The reason is considered to be because affinity between the paper layer 31b and the raw materials is high and adhesiveness is enhanced by the raw materials being entangled with minute irregularity of the fiber on the surface of the paper layer 31b. Also, the paper layer 31b functions as a cushion material at the time of drying and can secure flexibility of the raw material sheet 30 including the raw material layer 32 and the base material layer 31.

**[0048]** Fig. 4 is a diagram illustrating an example of a section of the raw material sheet 30 in a state in which the raw material sheet 30 is accommodated in the case 20. The raw material sheet 30 in the illustrated example includes three folding lines F1, F2, and F3. Specifically, the raw material sheet 30 is folded along the folding line F1 and the folding line F2 such that the raw material layer 32 faces itself, and is folded along the folding line F3 such that the base material layer 31 faces itself. In this manner, the raw material sheet 30 includes first clearances 33 formed by the raw material layer 32 facing itself and a second clearance 34 formed by the base material layer 31 facing itself. In other words, repulsive forces due to plastic deformation of the conductive layer 31a of the base material layer 31 and elastic deformation caused by the folding of the paper layer 31b interact with each other, a balance is maintained therebetween, and the first clearance 33 and the second clearance 34 can be formed without establishing completely close contact of the raw material sheet 30 itself, by folding the sheet along the folding lines F1, F2, and F3. Note that even in a case in which the base material layer 31 is formed only of the conductive layer 31a or the paper layer 31b, it is also possible to form the first clearances 33 and the second clearance 34 without causing complete close contact of the sheet due to a force of the conductive layer 31a maintaining the shape achieved through plastic deformation

or a repulsive force caused by elastic deformation due to folding of the paper layer 31b. In the illustrated example, the raw material sheet 30 includes a pair of first clearances 33, and the second clearance 34 is located between the pair of first clearances 33. In this manner, it is possible to substantially uniformly heat the raw material layer 32 located on both sides of the second clearance 34 with the heating blade of the heating portion 150 or the susceptor disposed at the second clearance 34, and as a result, it is possible to uniformize the aerosols generated from the pair of first clearances 33.

**[0049]** Fig. 5 is a diagram illustrating another example of the section of the raw material sheet 30 in the state in which the raw material sheet 30 is accommodated in the case 20. The raw material sheet 30 in the illustrated example includes three folding lines F4, F5, and F6. Specifically, the raw material sheet 30 is folded along the folding line F4 and the folding line F5 such that the raw material layer 32 faces itself and is folded along the folding line F6 such that the base material layer 31 faces itself. The direction in which the raw material sheet 30 illustrated in Fig. 5 is folded along the folding line F6 is opposite to that of the folding line F3 of the raw material sheet 30 illustrated in Fig. 4. In this manner, the raw material sheet 30 includes first clearances 33 formed by the raw material layer 32 facing itself and a second clearance 34 formed by the base material layer 31 facing itself. In other words, it is possible to form the first clearances 33 and the second clearance 34 without causing complete close contact of the sheet by folding the raw material sheet 30 along the folding lines F4, F5, and F6. In the illustrated example, the raw material sheet 30 includes a pair of first clearances 33, and the second clearance 34 is located between the pair of first clearances 33. In this manner, it is possible to substantially uniformly heat the raw material layer 32 located on both sides of the second clearance 34 with the heating blade of the heating portion 150 or the susceptor disposed at the second clearance 34, and as a result, it is possible to uniformize the aerosols generated from the pair of first clearances 33.

**[0050]** As illustrated in Figs. 4 and 5, the raw material sheet 30 can include the first clearance 33 formed by the raw material layer 32 facing itself, and the aerosols generated from the raw material layer 32 can thus pass through the first clearance 33. In other words, the first clearances 33 can define air flow paths through which the aerosols pass. In this manner, it is possible to efficiently deliver the aerosols generated from the raw material layer 32 toward the downstream side. Also, since the raw material sheet 30 includes the second clearance 34 formed by the base material layer 31 facing itself, it is possible to efficiently heat the raw material layer 32 without bringing the heating blade or the susceptor into contact with the raw material layer 32 by inserting the heating blade of the heating portion 150 or the susceptor into the second clearance 34. In this manner, contamination of the heating blade or the susceptor with the raw

material layer 32 is curbed, and it is possible to reduce a frequency of cleaning of the heating blade or the susceptor.

**[0051]** The raw material sheet 30 is not limited to the example illustrated in Figs. 4 and 5 and can have arbitrary folding lines. For example, the raw material sheet 30 may be folded only once such that the raw material layer 32 faces itself. Note that in a case where the heating portion 150 of the flavor inhaler 100 includes the induction coil, the conductive layer 31a of the raw material sheet 30 has the function of the susceptor. In other words, it is possible to heat the raw material layer 32 by the induction coil induction-heating the conductive layer 31a. In this case, the flavor inhaler 100 may not include the susceptor.

**[0052]** Fig. 6 is a side view of the cartridge 10 seen from the second opening 22. As illustrated in the drawing, the pair of connecting walls 20c of the case 20 can be formed into an arc shape, more specifically, a circular arc shape in a section seen from the second opening 22. Note that the terms "arc shape" or "circular arc shape" in the present specification include a substantial "arc shape" or "circular arc shape" and also include a case in which the connecting walls 20c have an angle that can be visually recognized. The connecting walls 20c include a plurality of half-cuts or debosses 25 on the inner surfaces thereof, that is, the surfaces facing the inside of the case 20. The half-cuts or debosses 25 extend between the first end surface 21a and the second end surface 22a of the case 20. The half-cuts or debosses 25 can be formed by cutting notches in the inner surfaces of the case 20, cutting parts of the inner surfaces, or compressing the inner surfaces. Also, the half-cuts or debosses 25 may be formed by laser processing. In other words, the half-cuts or debosses 25 can also be referred to as cut lines or indentation lines formed on the inner surfaces of the connecting walls 20c. The connecting walls 20c are folded along the half-cuts or debosses 25, and as a result, the connecting walls 20c are formed into arc shapes or circular arc shapes in the section seen from the second opening 22.

**[0053]** According to the cartridge 10 illustrated in Fig. 6, the material of the case 20 is easily folded along the half-cuts or debosses 25 when the connecting walls 20c of the case 20 are formed even if the case 20 is formed of a material having rigidity to some extent, for example, a cardboard, by the case 20 having the plurality of half-cuts or debosses 25. As a result, it is possible to appropriately bend the connecting walls 20c of the case 20. Also, the shape of the case 20 is easily maintained by the case 20 including the connecting walls 20c, as compared with a case in which the first wall 20a and the second wall 20b of the case 20 are connected with flat walls. Specifically, according to the case 20 in the present embodiment, the plurality of half-cuts or debosses 25 are deformed to collapse even if a force in a direction inclined with respect to the first wall 20a is applied to the case 20, for example, the inner surfaces of the connecting walls 20c defining the half-cuts or debosses 25 react

against each other by coming into contact with each other, and the shape of the case 20 illustrated in Fig. 6 is thus easily maintained.

**[0054]** Since each of the pair of connecting walls 20c of the case 20 is formed into an arc shape in the section seen from the second opening 22, the stress applied to the connecting walls 20c is dispersed, and it is possible to improve the strength of the case 20 as compared with the case in which the first wall 20a and the second wall 20b are connected with flat walls. Also, the cartridge 10 is provided with air flow paths inside the case 20 as described above. Specifically, the first clearances 33 of the raw material sheet 30 define the air flow paths. Therefore, it is possible to curb closing of the air flow paths inside the case 20 by the shape of the case 20 being easily maintained.

**[0055]** The interval of the plurality of half-cuts or debosses 25 is preferably equal to or greater than 0.5 mm and equal to or less than 3.0 mm and is more preferably equal to or greater than 0.5 mm and equal to or less than 1.5 mm. Here, the interval of the plurality of half-cuts or debosses 25 means the distance between adjacent half-cuts or debosses 25 in the section illustrated in Fig. 6. If the interval of the plurality of half-cuts or debosses 25 is less than 0.5 mm, the excessively short interval may cause a difficulty in manufacturing. Also, if the interval of the plurality of half-cuts or debosses 25 is greater than 3.0 mm, it becomes necessary to increase the size of the case 20 itself to form the connecting walls 20c, and there is a likelihood that the size is not suitable as the size of the cartridge 10 of the flavor inhaler 100. Additionally, if the interval between the plurality of half-cuts or debosses 25 is equal to or less than 1.5 mm, it is possible to cause the shapes of the connecting walls 20c to approach circular arc shapes and to more appropriately disperse the stress applied to the case 20. Therefore, if the interval of the plurality of half-cuts or debosses 25 falls within the above range, it is possible to reliably form the plurality of half-cuts or debosses 25 and to form the connecting walls 20c with the size that is suitable as the size of the cartridge 10.

**[0056]** The depth of the plurality of half-cuts or debosses 25 is preferably equal to or greater than 30% and equal to or less than 90% and is more preferably equal to or greater than 50% and equal to or less than 80% of the thickness of the connecting walls 20c. If the depth of the plurality of half-cuts or debosses 25 is less than 30% of the thickness of the connecting walls 20c, it is difficult to bend and fold the material forming the case 20, and it may be difficult to appropriately form the connecting walls 20c. Also, if the depth of the plurality of half-cuts or debosses 25 is greater than 90% of the thickness of the connecting walls 20c, there is a concern that the strength of the case 20 itself is excessively degraded. Therefore, if the depth of the plurality of half-cuts or debosses 25 falls within the above range, it is possible to appropriately form the connecting walls 20c and also to maintain the strength of the case 20 itself.

**[0057]** Although the connecting walls 20c are formed into arc shapes by providing the plurality of half-cuts or debosses 25 in the case 20 illustrated in Fig. 6, the present invention is not limited thereto, and the connecting walls 20c may have arbitrary folding lines (corner portions). For example, the case 20 can have a substantially hexagonal section by the connecting walls 20c including a half-cut or a deboss 25 at a boundary of each of the first wall 20a and the second wall 20b and another half-cut or deboss 25. It is possible to cause the shapes of the sections of the connecting walls 20c to approach the arc shapes by increasing the number of half-cuts or debosses 25.

**[0058]** The angle of the inner wall surfaces that are adjacent with the half-cut or the deboss 25 located at a boundary when the half-cut or the deboss 25 is formed in the inner surfaces of the connecting walls 20c is preferably greater than 90 degrees and less than 180 degrees and is more preferably equal to or greater than 100 degrees and equal to or less than 150 degrees. In a case in which the section of the case 20 has a quadrangular shape, for example, a part where the angle of the wall surfaces that are adjacent with the half-cuts or debosses 25 regarded as boundaries is equal to or less than 90 degrees occurs. Even if the half-cuts or debosses 25 are formed when the case 20 is formed of a cardboard with sufficient rigidity, it is difficult to maintain the shape of the case 20 due to a strong repulsive force of the cardboard due to folding of the case 20 at an angle of equal to or less than 90 degrees. If the case 20 is formed of a cardboard that has low rigidity to such an extent that the shape of the case 20 can be maintained, the strength of the case 20 is degraded. If the above angle is equal to or greater than 100 degrees and equal to or less than 150 degrees, it is possible to cause the sectional shapes of the connecting walls 20c to be substantially arc shapes.

**[0059]** The plurality of half-cuts or debosses 25 are preferably provided over not less than 50% of the length between the first end surface 21a and the second end surface 22a of the case 20. If the plurality of half-cuts or debosses 25 are provided over less than 50% of the length between the first end surface 21a and the second end surface 22a of the case 20, the effect of facilitating formation of the connecting walls 20c when the material forming the case 20 is folded is low. Therefore, if the length of the plurality of half-cuts or debosses 25 is equal to or greater than the above numerical value, it is possible to easily bend the connecting walls 20c along the plurality of half-cuts or debosses 25.

**[0060]** Also, the cartridge 10 may include an adhesive 44 provided on the plurality of half-cuts or debosses 25. In this manner, it is possible to maintain the curved shapes of the connecting walls 20c with the adhesive 44 and thereby to more firmly maintain the shape of the case 20. Also, the adhesive 44 may be configured to establish adhesion between the case 20 and the raw material sheet 30 as illustrated in Fig. 6. In this case, it is possible to maintain the curved shapes of the connecting walls 20c

and to curb deviation of the raw material sheet 30 with respect to the case 20 with the adhesive 44. As the adhesive 44, it is possible to use, for example, a vinyl acetate resin-based adhesive or a carboxy methyl cellulose (CMC) adhesive.

**[0061]** Also, as illustrated in the drawing, the case 20 and the raw material sheet 30 can be bonded with an adhesive 40. Specifically, the inner surface of the case 20 and at least a part of the raw material sheet 30 are bonded with the adhesive 40. In this manner, positional deviation of the raw material sheet 30 with respect to the case 20 is curbed when the heating blade of the heating portion 150 or the susceptor is inserted into the second clearance 34 of the raw material sheet 30. As the adhesive 40, it is possible to use, for example, a vinyl acetate resin-based adhesive or a carboxy methyl cellulose (CMC) adhesive.

**[0062]** Next, a method for manufacturing the cartridge 10 will be described. Fig. 7 is a schematic diagram illustrating a process for manufacturing the cartridge 10. First, a case paper 20' that is a raw material of the case 20 is prepared. As illustrated in the drawing, the case paper 20' is preferably wound into a roll shape. In this manner, it is possible to reduce the disposition space for the case paper 20' and to successively manufacture the cartridge 10. As illustrated in the drawing, the case paper 20' is fed in a first direction C1 by a feeding roller 73. Subsequently, the raw material sheet 30 is disposed on the case paper 20'. In the illustrated example, the raw material sheet 30 is adsorbed to and held by a supply drum 75 and is then disposed on the case paper 20' by the supply drum 75. Specifically, the supply drum 75 successively disposes a plurality of raw material sheets 30 at predetermined intervals in the first direction C1. The case paper 20' can be transported in the first direction C1 in a state in which the case paper 20' is adsorbed to a suction conveyer, for example. The raw material sheets 30 are preferably disposed on the case paper 20' that is being transported. In this manner, it is possible to successively dispose the raw material sheets 30 on the case paper 20' and thereby to achieve mass production of the cartridge 10.

**[0063]** Subsequently, the case paper 20' is folded. At this time, the case paper 20' is folded, and the raw material sheet 30 is thereby folded along with the case paper 20' in the present embodiment as illustrated in the drawing. Specifically, the case paper 20' has a first end portion E1 and a second end portion E2 on the side opposite to the first end portion E1 in a direction that is orthogonal to the first direction C1, the first end portion E1 of the case paper 20' is folded along the half-cut or the deboss 25, and the raw material sheet 30 is folded along with the case paper 20' along the folding line F3 at that time in the present embodiment. Thereafter, the case paper 20' is wrapped around the raw material sheet 30. Specifically, the second end portion E2 of the case paper 20' is folded along the half-cut or the deboss 25 and is then wrapped around the raw material sheet 30 in the present

embodiment. In this manner, it is possible to reduce the number of processes and to improve productivity of the cartridge 10 as compared with a case where the raw material sheet 30 and the case paper 20' are separately folded and the raw material sheet 30 is then accommodated in the case 20.

**[0064]** The first end portion E1 and the second end portion E2 of the case paper 20' are preferably bonded to each other with an adhesive 43. Specifically, the adhesive 43 is applied to the first end portion E1 of the case paper 20' in the first direction C1. Subsequently, the second end portion E2 of the case paper 20' is folded to wrap the raw material sheet 30, and the first end portion E1 and the second end portion E2 of the case paper 20' are bonded to each other with the adhesive 43 interposed therebetween. As the adhesive 43, it is possible to use, for example, a vinyl acetate resin-based adhesive or a carboxymethyl cellulose (CMC) adhesive.

**[0065]** After the case paper 20' is wrapped around the raw material sheet 30, the case paper 20' is preferably cut along a plane intersecting the first direction C1. It is thus possible to form the cartridge 10 with an arbitrary length. Specifically, the case paper 20' is preferably cut along a plane that is orthogonal to the first direction C1. Fig. 8 is a schematic view illustrating an example of the cut location of the case paper 20'. As illustrated in Fig. 8, a clearance S1 can be provided between the raw material sheet 30 and the raw material sheet 30 disposed along the first direction C1. In this case, the case paper 20' can be cut at the cut location C2 in the clearance S1 on the basis of a result of detecting the cut location obtained by a sensor, which is not illustrated, for example. In this manner, the cartridge 10 with a predetermined length is formed.

**[0066]** As illustrated in Fig. 7, the raw material sheet 30 includes a first end portion E3 and a second end portion E4 facing the first end portion E3. The first end portion E3 and the second end portion E4 of the raw material sheet 30 can be folded such that the raw material layer 32 faces itself before the raw material sheet 30 is disposed on the case paper 20'. Subsequently, the case paper 20' is folded such that the base material layer 31 of the raw material sheet 30 faces itself after the raw material sheet 30 is disposed on the case paper 20', and the raw material sheet 30 and the case paper 20' can be thereby folded together. The raw material sheet 30 illustrated in Fig. 4 or 5 can thus be formed. In the illustrated example, the raw material sheet 30 is folded along the folding lines F1, F2, and F3, and the raw material sheet 30 illustrated in Fig. 4 is thus formed. The raw material sheet 30 is not limited thereto and may not be folded before being disposed on the case paper 20'. In this manner, the raw material sheet 30 illustrated in Fig. 4 or 5 is formed in the example illustrated in Fig. 7. Therefore, it is possible to efficiently heat the raw material layer 32 without bringing the blade or the susceptor of the heating portion 150 into contact with the raw material layer 32 by heating the raw material sheet 30 with the blade, the sus-

ceptor, or the like disposed in the clearance (second clearance 34) where the base material layer 31 faces itself. In this manner, contamination of the blade or the susceptor due to the raw material layer 32 is curbed, and it is possible to reduce the frequency of cleaning of the heating blade or the susceptor. Also, the clearance where the raw material layer 32 faces itself (first clearance 33) defines an air flow path, and the aerosols generated from the raw material layer 32 can pass through the clearance. It is thus possible to efficiently deliver the aerosols generated from the raw material layer 32 toward the downstream side.

**[0067]** As illustrated in Fig. 7, the raw material sheet 30 is preferably wound in a roll shape. It is thus possible to reduce the disposition space for the raw material sheet 30 and to successively supply the raw material sheet 30. As illustrated in the drawing, the raw material sheet 30 is fed in the first direction C1 by the feeding roller 71. In the illustrated example, the raw material sheet 30 in a roll shape is cut into a predetermined length, and the cut raw material sheet 30 is disposed on the case paper 20'. It is thus possible to successively manufacture the raw material sheet 30 with a predetermined length from the raw material sheet 30 in a roll shape, thereby to successively dispose the raw material sheet 30 on the case paper 20', and to improve productivity of the cartridge 10. Specifically, the raw material sheet 30 in a roll shape is supplied to the cutting roller 74 by the feeding roller 71, is then adsorbed thereto, and is cut in the direction intersecting the first direction C1 by a cutter 72 provided at the cutting roller 74.

**[0068]** As illustrated in Fig. 7, it is preferable that the half-cut or the deboss 25 be formed in the case paper 20' and the case paper 20' be folded along the half-cut or the deboss 25. In this manner, the material of the case 20 (case paper 20') is easily folded along the half-cut or the deboss 25 when the case 20 is formed even if the case paper 20' is formed of a material having rigidity to some extent, for example, a cardboard.

**[0069]** Also, it is preferable that the raw material sheet 30 be disposed on the half-cut or the deboss 25 formed in the case paper 20' and the case paper 20' and the raw material sheet 30 be folded together along the half-cut or the deboss 25. In this manner, deviation of the folded position is curbed, and it is possible to fold the case paper 20' and the raw material sheet 30 at an appropriate position.

**[0070]** As illustrated in Fig. 7, the adhesive 40 can be applied to the case paper 20'. In this case, the raw material sheet 30 is preferably disposed on the case paper 20' such that the base material layer 31 comes into contact with the adhesive 40 applied to the case paper 20'. In this manner, adhesion of the adhesive 40 to the raw material layer 32 is curbed, and it is possible to curb an influence of the adhesive 40 on a smoking taste.

**[0071]** Although only the raw material sheet 30 is accommodated in the case 20 in the cartridge 10 in the example explained above, the present invention is not

limited thereto, and a part (for example, a filter) to be located adjacent to the raw material sheet 30 may be accommodated in the case 20. Fig. 9 is a schematic view illustrating a process for accommodating the raw material sheet 30 and a part 12 in the case 20. As illustrated in Fig. 9, a conveyor 260 transports an object to be transported in the first direction C1. The supply drum 75 illustrated in Fig. 7 and a supply drum 76 for supplying the part 12 are disposed on the transport path of the conveyor 260. Although the supply drum 75 is located on the upstream side of the supply drum 76 in the first direction C1 in the illustrated example, the present invention is not limited thereto.

**[0072]** As illustrated in Fig. 9, the supply drum 75 successively disposes a plurality of raw material sheets 30 at predetermined intervals in the first direction C1. Subsequently, the supply drum 76 disposes the part 12 between the plurality of raw material sheets 30 on the conveyor 260. In other words, the supply drum 75 and the supply drum 76 successively dispose the plurality of raw material sheets 30 and the plurality of parts 12 on the conveyor 260 such that the raw material sheets 30 and the parts 12 are adjacent to each other in the first direction C1. Note that only a single raw material sheet 30 and a single part 12 may be disposed on the conveyor 260.

**[0073]** As illustrated in Fig. 9, a clearance can be provided between the raw material sheet 30 and the part 12 disposed on the conveyor 260. Thus, it is preferable to slide the part 12 in a direction opposite to the first direction C1, for example, to reduce the clearance between the raw material sheet 30 and the part 12.

**[0074]** As illustrated in Fig. 9, a fixation table 322 may be disposed on the downstream side of the conveyor 260, and a lugged belt 300 and a pair of rollers 305 for driving the lugged belt 300 may be provided above the fixation table 322. The surface of the lugged belt 300 facing the fixation table 322 moves in the first direction C1. The lugged belt 300 includes a plurality of projecting portions 300a along the moving direction. The projecting portions 300a of the lugged belt 300 come into contact with the part 12 disposed on the conveyor 260. The speed of the lugged belt 300 is lower than the transport speed of the conveyor 260.

**[0075]** Since the speed of the lugged belt 300 is lower than the transport speed of the conveyor 260, the projecting portions 300a of the lugged belt 300 cause the part 12 disposed on the conveyor 260 to slide in a direction opposite to the first direction C1. As a result, the clearance between the part 12 in contact with the lugged belt 300 and the raw material sheet 30 located behind in the first direction C1 is reduced. Thereafter, the lugged belt 300 causes the set of the raw material sheet 30 and the part 12 with a reduced clearance therebetween to slide on the fixation table 322 and transports them to the case paper 20' on the downstream side.

**[0076]** As illustrated in Fig. 9, a feeding roller 325 that feeds the case paper 20' is disposed on the downstream side of the fixation table 322. The case paper 20' is trans-

ported in the first direction C1 by a conveyor, which is not illustrated after being fed by the feeding roller 325. A half-cut roller 327 and a cold glue supply device 310 may be disposed on the upstream side of the feeding roller 325. The half-cut roller 327 can be configured to form the half-cut or the deboss 25 illustrated in Fig. 7 in the transport direction of the case paper 20'. The cold glue supply device 310 applies the adhesive 40 illustrated in Fig. 7 to the case paper 20' that is being transported. In this manner, the raw material sheet 30 and the part 12 can be bonded to the case paper 20'. Also, a cold glue supply device 315 may be disposed on the downstream side of the feeding roller 325. The cold glue supply device 315 can apply the adhesive 43 illustrated in Fig. 7 for forming the case 20 by folding the case paper 20' to the case paper 20'.

**[0077]** Subsequently, the case paper 20' can be cut by a round knife, for example, along a plane intersecting the first direction C1. Specifically, the case paper 20' is cut along a plane that is orthogonal to the first direction C1 on the basis of a result of detecting a cut location obtained by a sensor, for example. Fig. 10 is a schematic view illustrating an example of the cut location of the case paper 20'. As illustrated in Fig. 10, the clearance S1 can be provided between the raw material sheet 30 and the part 12 disposed in the first direction C1. In this case, the case paper 20' can be cut at the cut location C3 in the clearance S1. In this manner, the cartridge 10 including the raw material sheet 30 and the part 12 is formed.

**[0078]** Also, a part (a filter, for example) separated from the raw material sheet 30 may be accommodated in the case 20. Fig. 11 is a schematic view illustrating a process for accommodating the raw material sheet 30 and the separated part 12 in the case 20. As illustrated in Fig. 11, the case paper 20' is transported in the first direction C1 by a conveyor, which is not illustrated, after being fed by the feeding roller 325. Similarly to the example illustrated in Fig. 9, the half-cut roller 327 and the cold glue supply device 310 may be disposed on the upstream side of the feeding roller 325. The supply drum 75 illustrated in Fig. 7 and the supply drum 76 are disposed on the transport path of the case paper 20' transported in the first direction C1. Although the supply drum 75 is located on the upstream side of the supply drum 76 in the first direction C1 in the illustrated example, the present invention is not limited thereto.

**[0079]** In the example illustrated in Fig. 11, the raw material sheet 30 and the part 12 with a length that is double the length of the raw material sheet 30 and the part 12 used in the cartridge 10 may be disposed on the case paper 20' by the supply drum 75 and the supply drum 76. As illustrated in Fig. 11, the supply drum 75 successively dispose the plurality of raw material sheets 30 at predetermined intervals in the first direction C1 on the case paper 20'. Subsequently, the supply drum 76 disposes the parts 12 between the plurality of raw material sheets 30 on the case paper 20'. In other words, the supply drum 75 and the supply drum 76 successively

dispose the plurality of raw material sheets 30 and the plurality of parts 12 on the case paper 20' such that the raw material sheets 30 and the parts 12 are separated from each other at the predetermined intervals in the first direction C1. Thereafter, each case paper 20' and each raw material sheet 30 are folded in a process that is similar to the process illustrated in Fig. 7.

**[0080]** Subsequently, the case paper 20' is cut by a round knife, for example, along a plane intersecting the first direction C1. Specifically, the case paper 20' is cut along a plane that is orthogonal to the first direction C1 on the basis of a result of detecting a cut location obtained by a sensor, for example. Fig. 12 is a schematic view illustrating an example of cut locations of the case paper 20'. As illustrated in Fig. 12, the case paper 20' can be cut at the cut location C4 located at the center of the raw material sheet 30 in the first direction C1 and the cut location C5 located at the center of the part 12 in the first direction C1.

**[0081]** Fig. 13 is a schematic plan view of the cartridge 10 formed by being cut at the cut locations illustrated in Fig. 12. As illustrated in Fig. 13, the raw material sheet 30 and the part 12 are separately disposed in the case 20. In this manner, the cartridge 10 including a hollow (cooling portion) between the raw material sheet 30 and the part 12 is formed.

**[0082]** Although the embodiments of the present invention have been described hitherto, the present invention is not limited to the above embodiments, and various modifications 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 illustrated in the specification and the drawing are also 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 applications can be achieved.

#### REFERENCE SIGNS LIST

##### **[0083]**

- 10 Cartridge
- 14 Paper layer
- 20 Case
- 20' Case paper
- 25 Half-cut or deboss
- 30 Raw material sheet
- 31 Base material layer
- 31a Conductive layer
- 31b Paper layer
- 32 Raw material layer
- 40 Adhesive
- 100 Flavor inhaler
- C1 First direction
- E1 First end portion
- E2 Second end portion
- E3 First end portion

E4 Second end portion

## Claims

1. A method for manufacturing a flavor inhaler cartridge that includes a raw material sheet including a base material layer and a raw material layer, and a case accommodating the raw material sheet therein, the method comprising:

disposing the raw material sheet on a case paper that is a raw material of the case;  
folding the case paper and thereby folding the raw material sheet along with the case paper;  
and  
wrapping the case paper around the raw material sheet.

2. The method for manufacturing a cartridge according to claim 1,

wherein the base material layer includes a conductive layer containing a material with conductivity and a paper layer laminated on the conductive layer, and  
the raw material layer is provided on the paper layer.

3. The method for manufacturing a cartridge according to claim 1 or 2, further comprising:

cutting the raw material sheet in a roll shape into a predetermined length; and  
disposing the cut raw material sheet on the case paper.

4. The method for manufacturing a cartridge according to any one of claims 1 to 3, further comprising:

transporting the case paper in a first direction;  
and  
disposing the raw material sheet on the case paper that is being transported.

5. The method for manufacturing a cartridge according to claim 4, further comprising:  
cutting the case paper along a plane intersecting the first direction.

6. The method for manufacturing a cartridge according to any one of claims 1 to 5, further comprising:

a process of forming a half-cut or a deboss in the case paper; and  
folding the case paper along the half-cut or the deboss.

7. The method for manufacturing a cartridge according to claim 6, further comprising:

disposing the raw material sheet on the half-cut or the deboss of the case paper; and  
folding the case paper and the raw material sheet together along the half-cut or the deboss.

8. The method for manufacturing a cartridge according to any one of claims 1 to 7, further comprising:

folding a first end portion and a second end portion facing the first end portion of the raw material sheet such that the raw material layer faces itself before disposing the raw material sheet on the case paper; and  
folding the case paper and thereby folding the raw material sheet along with the case paper such that the base material layer of the raw material sheet faces itself after disposing the raw material sheet on the case paper.

9. The method for manufacturing a cartridge according to any one of claims 1 to 8, further comprising:

applying an adhesive to the case paper; and  
disposing the raw material sheet on the case paper such that the base material layer comes into contact with the adhesive applied to the case paper.

Fig. 1

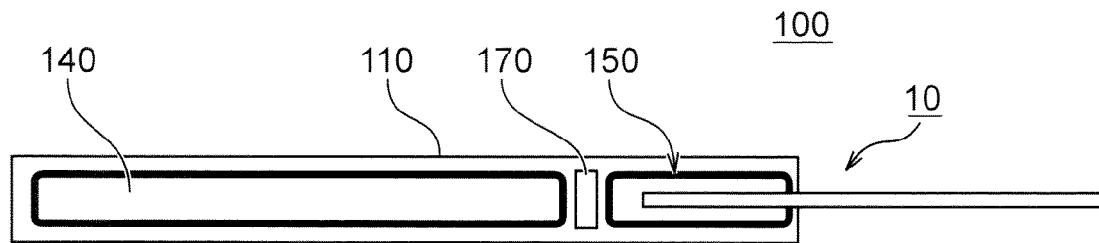


Fig. 2

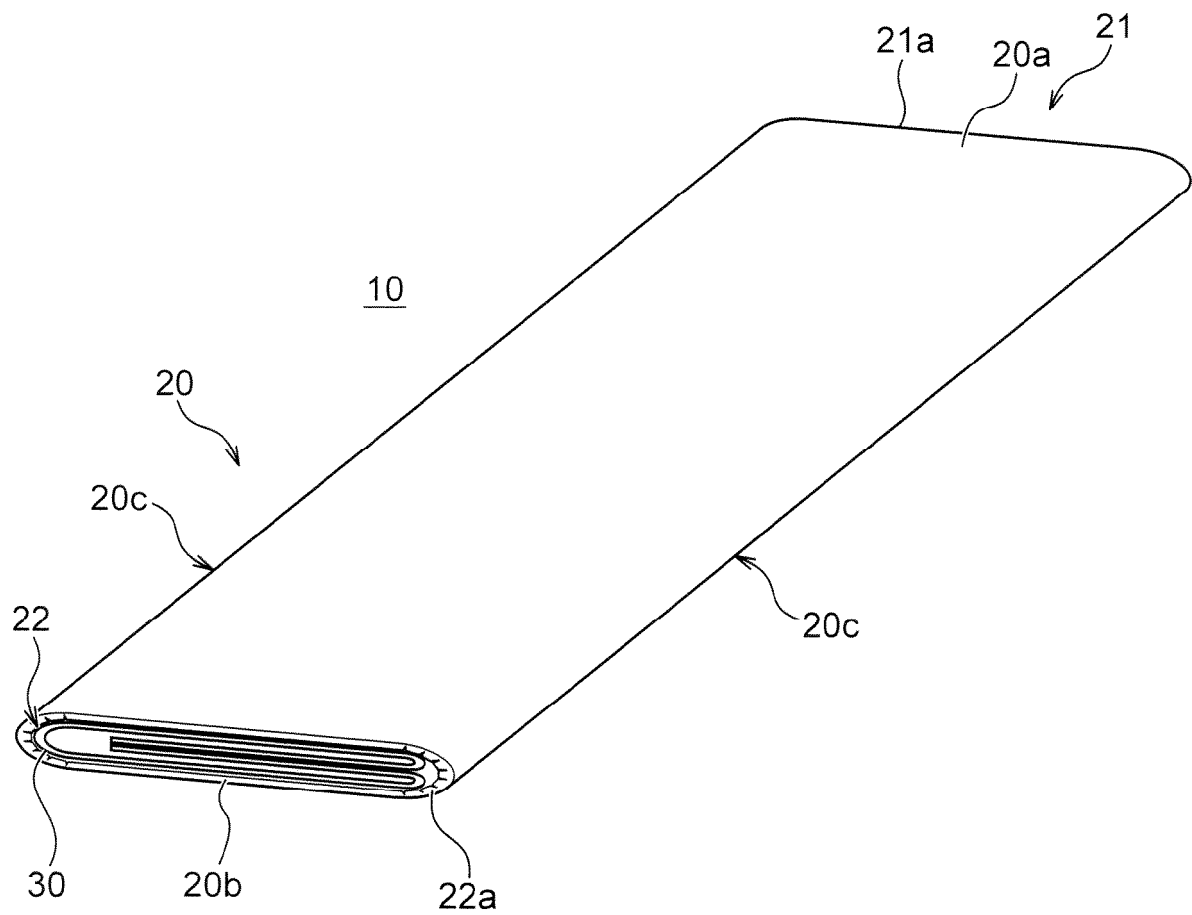


Fig. 3

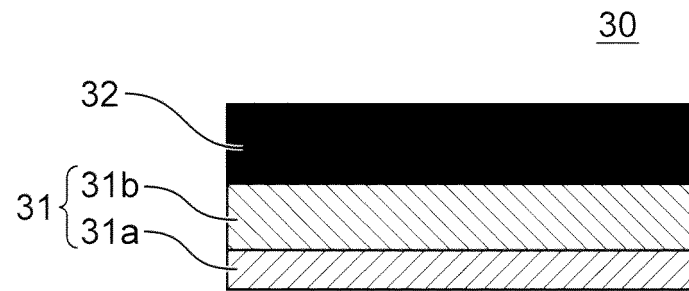


Fig. 4

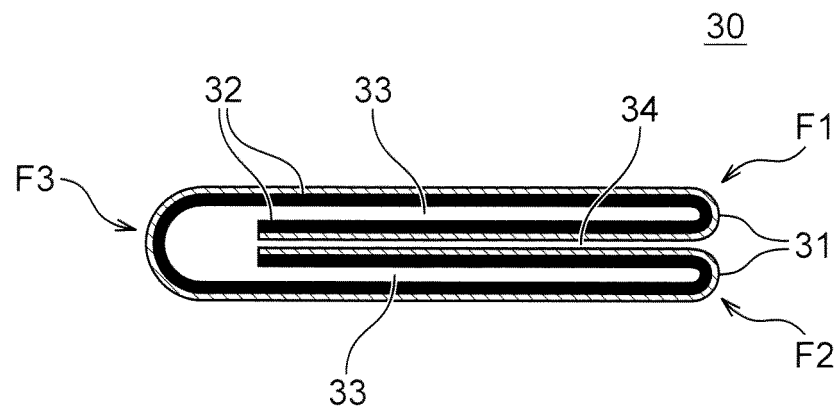


Fig. 5

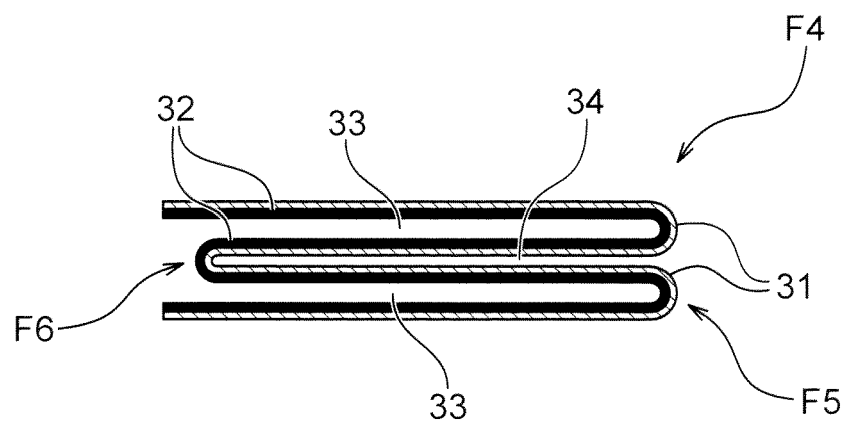


Fig. 6

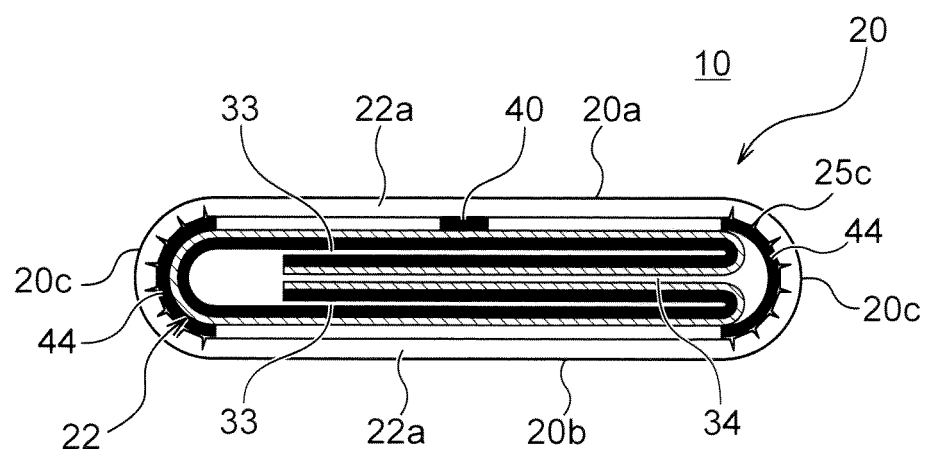


Fig. 7

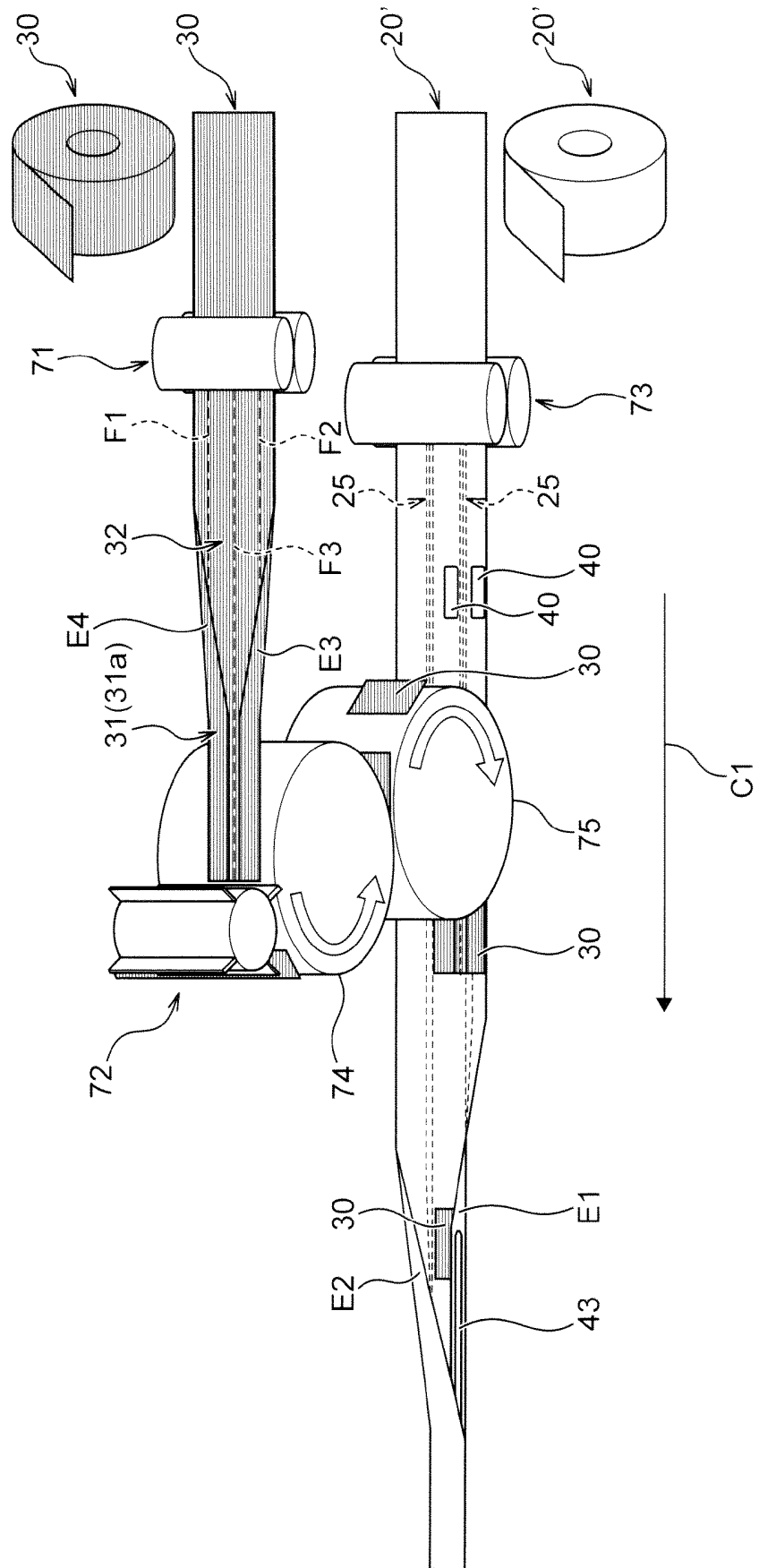


Fig. 8

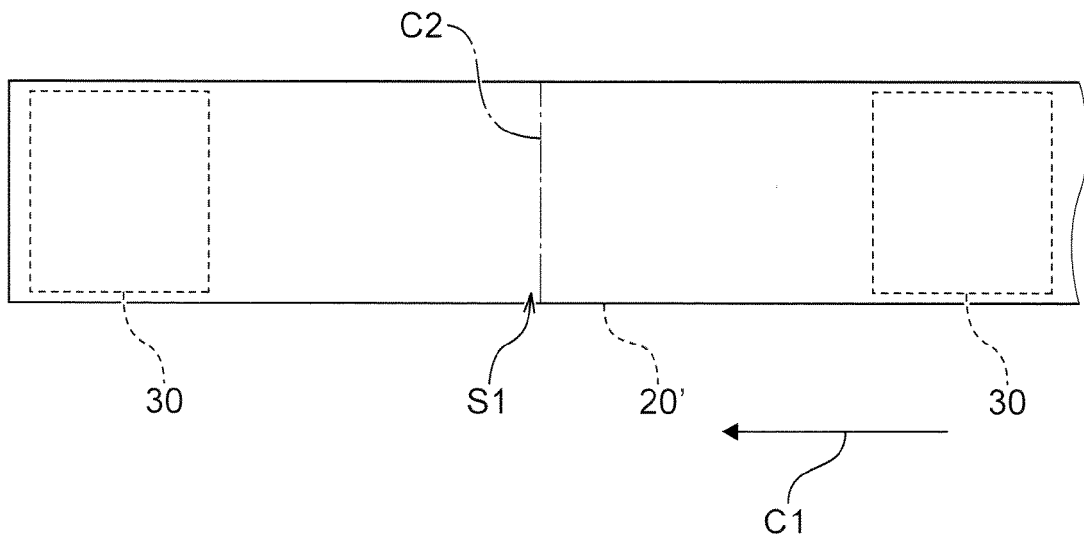
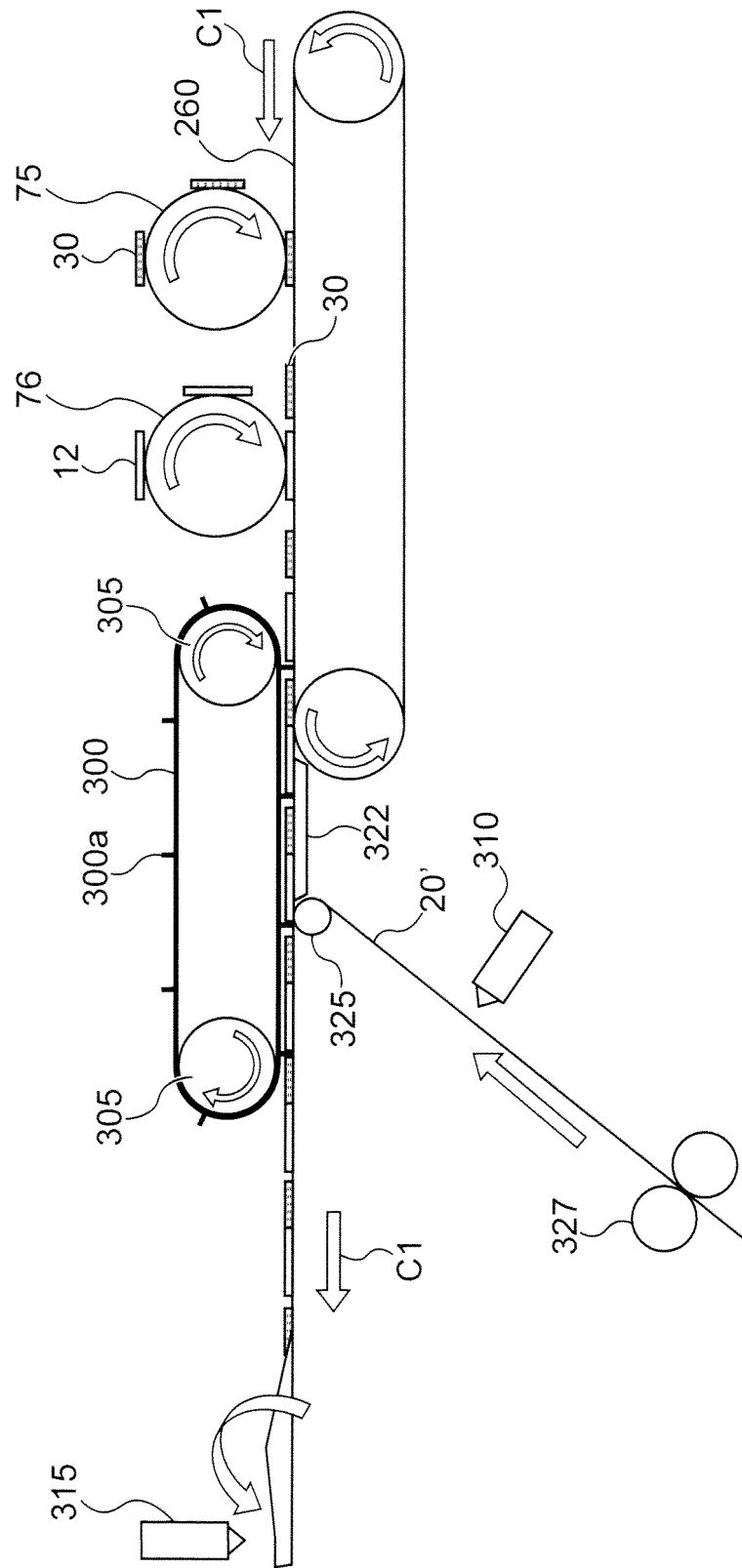
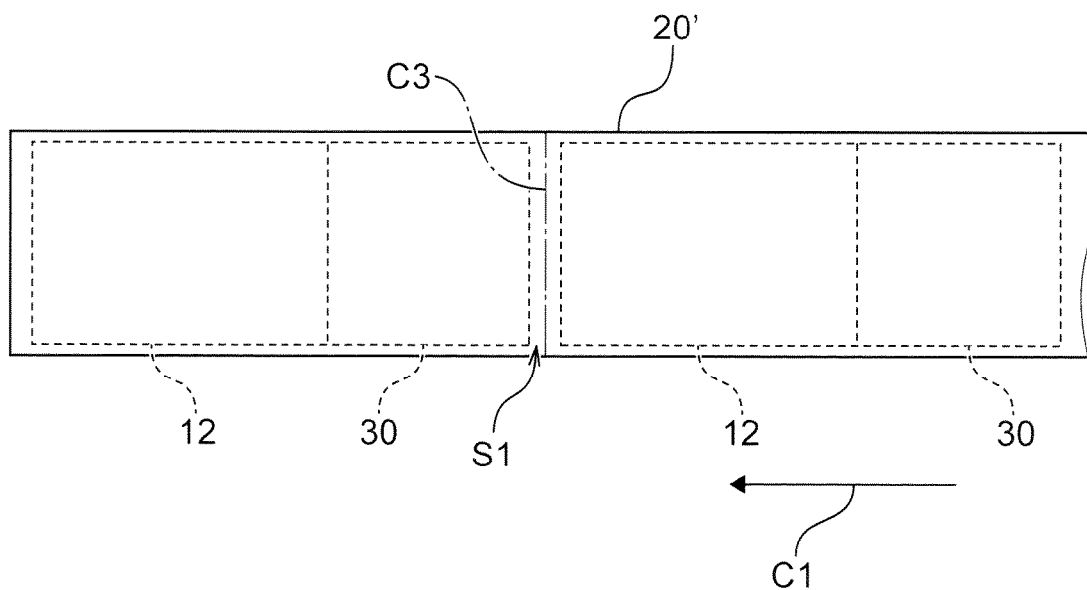


Fig. 9



**Fig. 10**



**Fig. 11**

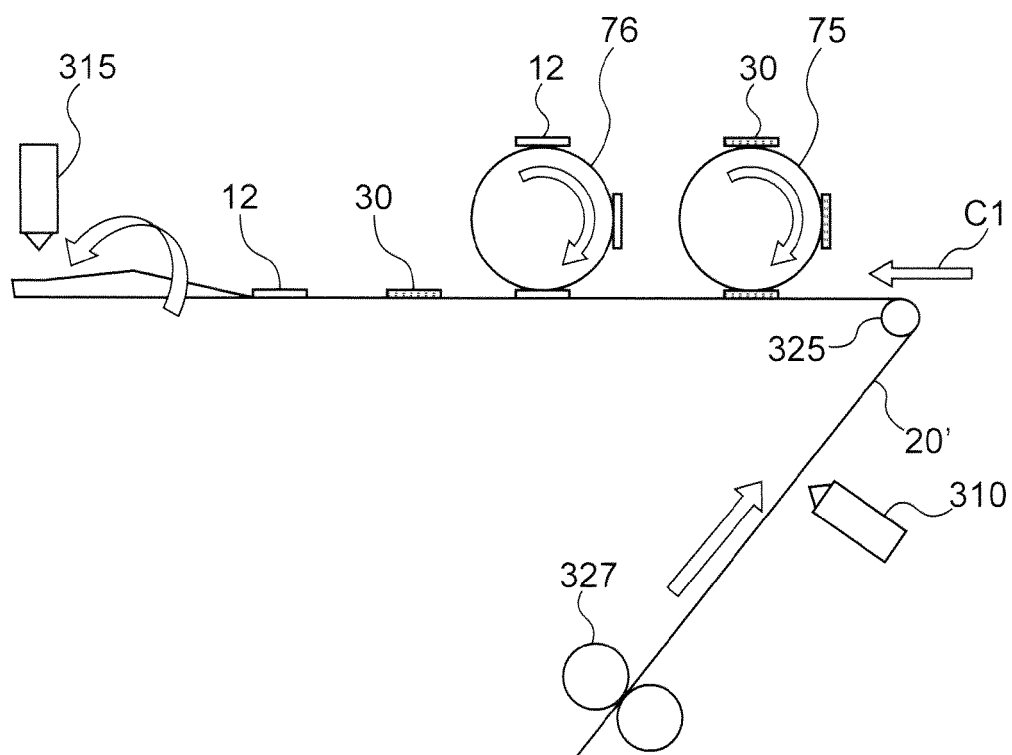


Fig. 12

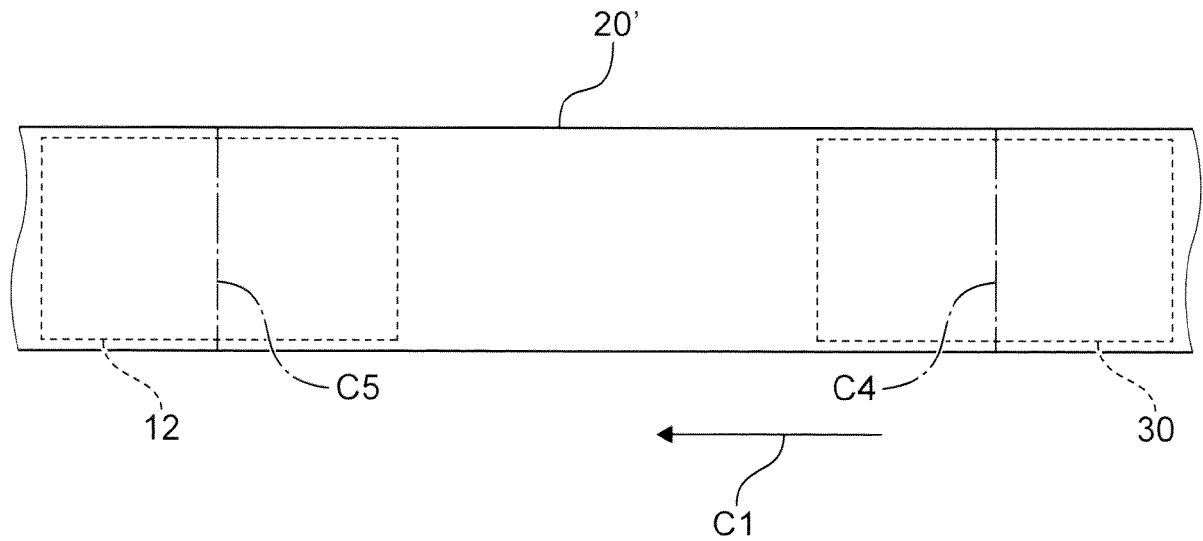
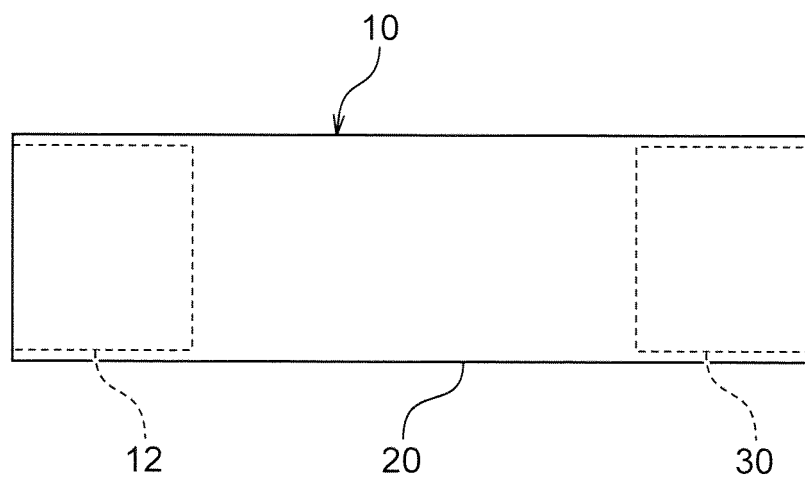


Fig. 13



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2021/024306

## A. CLASSIFICATION OF SUBJECT MATTER

A24F 40/20(2020.01)i

FI: A24F40/20

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

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A24F40/20

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

Published examined utility model applications of Japan 1922-1996

Published unexamined utility model applications of Japan 1971-2021

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. |
|-----------|---------------------------------------------------------------------------------------------------------------|-----------------------|
| A         | JP 2019-513374 A (PHILIP MORRIS PRODUCTS S.A) 30<br>May 2019 (2019-05-30) entire text, all drawings           | 1-9                   |
| A         | JP 2019-519224 A (PHILIP MORRIS PRODUCTS S.A) 11<br>July 2019 (2019-07-11) entire text, all drawings          | 1-9                   |
| A         | WO 2019/030272 A1 (PHILIP MORRIS PRODUCTS S.A.) 14<br>February 2019 (2019-02-14) entire text, all<br>drawings | 1-9                   |



Further documents are listed in the continuation of Box C.



See patent family annex.

## \* Special categories of cited documents:

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Date of the actual completion of the international search

27 July 2021 (27.07.2021)

Date of mailing of the international search report

17 August 2021 (17.08.2021)

Name and mailing address of the ISA/  
Japan Patent Office  
3-4-3, Kasumigaseki, Chiyoda-ku,  
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Authorized officer

Telephone No.

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

|                                                    |
|----------------------------------------------------|
| International application No.<br>PCT/JP2021/024306 |
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| Patent Documents referred in the Report | Publication Date | Patent Family                                                                                | Publication Date |
|-----------------------------------------|------------------|----------------------------------------------------------------------------------------------|------------------|
| JP 2019-513374 A                        | 30 May 2019      | US 2017/0280769 A1<br>entire text, all<br>drawings<br>CN 108778007 A<br>KR 10-2018-0124910 A |                  |
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**REFERENCES CITED IN THE DESCRIPTION**

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