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- **UEMATSU, Hiromi**
Tokyo 130-8603 (JP)
- **TOKITSU, Naohiro**
Tokyo 130-8603 (JP)
- **KATAYAMA, Kazuhiko**
Tokyo 130-8603 (JP)
- **HARUKI, Keisuke**
Tokyo 130-8603 (JP)

(71) Applicant: **Japan Tobacco Inc.**
Tokyo 105-6927 (JP)

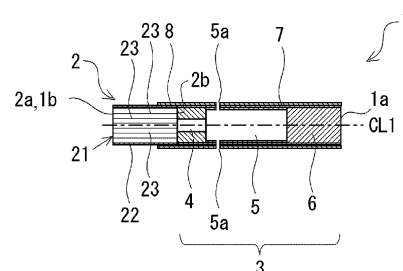
(74) Representative: **Hoffmann Eitle**
Patent- und Rechtsanwälte PartmbB
Arabellastraße 30
81925 München (DE)

(72) Inventors:
• **MANABE, Tetsuya**
Tokyo 130-8603 (JP)

(54) **HEATING-TYPE TOBACCO**

(57) Provided is a technique that is used for a heating-type tobacco provided with a tobacco rod having a tobacco filler containing a tobacco raw material and an aerosol generating substrate and a rolling paper for rolling the tobacco filler to ensure delivery of a large amount of aerosol, enable a heater to be smoothly inserted into the tobacco filler, and prevent the tobacco raw material from being pushed inwards by the heater when the heater is inserted into the tobacco filler. This heating-type tobacco is provided with a tobacco rod having a tobacco filler and a rolling paper for rolling the tobacco filler. The tobacco filler has multiple tobacco strands which are a tobacco raw material formed in the form of strands and containing an aerosol generating substrate. The multiple tobacco strands are aligned and arranged to extend in the longitudinal direction of the tobacco rod, and at least some of the strands are bonded integrally.

FIG. 1



EP 3 949 770 A1

Description

Technical Field

[0001] The present invention relates to a heating-type tobacco.

Background Art

[0002] There is a known heating-type tobacco including a tobacco rod formed by filling the inside of wrapping paper with a tobacco filler containing a tobacco raw material (for example, tobacco shreds, tobacco granules, a reconstituted tobacco material, and the like) and an aerosol-source material (glycerin, propylene glycol, and the like) (refer to, for example, PTL 1). A heating-type tobacco of such a type is a tobacco article of a type that heats a tobacco filler by a heater of a heating device without burning the tobacco filler and delivers an aerosol generated at the tobacco filler to a user. As the heater, heaters having various shapes, such as a blade shape and a rod shape, have been practically used. The heater is inserted for use from the leading end surface of the tobacco rod, and the tobacco rod is thereby attached to the heating device.

Citation List

Patent documents

[0003]

Patent document 1: Japanese Patent No. 5920744
 Patent document 2: Japanese Patent No. 6000451
 Patent document 3: Japanese Patent No. 6017546
 Patent document 4: Japanese Patent Application Publication No. 62-272962

Summary of Invention

Technical Problem

[0004] Here, in a tobacco rod for an existing heating-type tobacco, a tobacco raw material of a tobacco filler is oriented randomly. Thus, it may be difficult to smoothly insert a heater into the tobacco filler when attaching the heating-type tobacco to a heating device. In addition, in formation of a tobacco rod of a heating-type tobacco by using a tobacco filler in which a tobacco raw material is oriented randomly, an aerosol generated as a result of an aerosol-source material being volatilized is easily condensed by being exposed to a low-temperature part of the randomly oriented tobacco raw material and is easily filtered by the tobacco raw material, and the delivery amount of the aerosol into an oral cavity may decrease.

[0005] The inventors of the present application have discovered that it is possible to improve a tobacco rod for a conventional heating-type tobacco by employing a

structure in which a large number of long tobacco strands obtained by forming a tobacco raw material into strand shapes are disposed to extend in the longitudinal direction of a tobacco rod.

[0006] However, when a large number of tobacco strands are oriented in the longitudinal direction of a tobacco rod, there is a concern of the tobacco strands being pressed by a heater, when the heater is inserted from the leading end surface of the tobacco rod, into the base end side (for example, the filter side) of the tobacco rod.

[0007] The present invention has been made in consideration of the aforementioned circumstances, and an object of the present invention is to provide a technique that is excellent in terms of the delivery amount of an aerosol, that enables smooth insertion of a heater into a tobacco filler, and that can suppress a tobacco raw material from being pressed by the heater when the heater is inserted into the tobacco filler, in a heating-type tobacco including a tobacco rod that includes the tobacco filler including the tobacco raw material and an aerosol-source material and wrapping paper that wraps the tobacco filler.

Solution to Problem

[0008] The present invention for solving the aforementioned problems is a heating-type tobacco including a tobacco rod that includes a tobacco filler and wrapping paper that wraps the tobacco filler. The tobacco filler includes a plurality of tobacco strands each of which is formed in a strand shape and is a tobacco raw material containing an aerosol-source material. The plurality of tobacco strands is aligned and disposed to extend in a longitudinal direction of the tobacco rod, and at least some of the tobacco strands are fixed to each other integrally.

[0009] In the heating-type tobacco according to the present invention, a fixed region portion in which at least some of the tobacco strands are fixed to each other integrally may be formed at only a specific portion of the tobacco rod in the longitudinal direction.

[0010] In the heating-type tobacco according to the present invention, the fixed region portion may be formed at a portion on a rear end side of the tobacco rod.

[0011] In the heating-type tobacco according to the present invention, a fixed region portion in which at least some of the tobacco strands are fixed to each other integrally may be formed in the tobacco rod over the entire length of the tobacco rod.

[0012] In the heating-type tobacco according to the present invention, in the fixed region portion, at least some of the tobacco strands may be point-bonded to each other.

[0013] In the heating-type tobacco according to the present invention, in the fixed region portion, a fixing agent that point-bonds at least some of the tobacco strands to each other may be dotted.

[0014] In the heating-type tobacco according to the present invention, the fixing agent may include at least

one of carboxymethyl cellulose, polyvinyl alcohol, and ethylene-vinyl acetate copolymer resin.

[0015] In the heating-type tobacco according to the present invention, the fixed region portion may be formed to cover only a portion of a cross-section of the tobacco rod.

[0016] In the heating-type tobacco according to the present invention, the fixed region portion may be formed in only a specific region that is a portion of the cross-section of the tobacco rod, and the specific region may be set in the cross-section of the tobacco rod as a region that includes a heater insertion region into which a heater is inserted when the heating-type tobacco is attached to a heating device.

[0017] In the heating-type tobacco according to the present invention, the fixed region portion may be arranged in a mesh shape or a lattice shape along the cross-section of the tobacco rod.

[0018] In the heating-type tobacco according to the present invention, the fixing agent that fixes at least some of the tobacco strands to each other in the fixed region portion may include at least one of calcium carbonate and sodium silicate.

[0019] In the heating-type tobacco according to the present invention, at least some of the tobacco strands may be coupled to each other via a tobacco coupling member formed by a tobacco raw material.

[0020] In the heating-type tobacco according to the present invention, the tobacco coupling member may couple portions on a rear end side of the tobacco strands to each other.

[0021] In the heating-type tobacco according to the present invention, the tobacco strands of a number that is 50% or more of a total number of the tobacco strands included in the tobacco filler may be fixed to each other integrally. In addition, the tobacco strands of a number that is 70% or more of a total number of the tobacco strands included in the tobacco filler may be fixed to each other integrally. In addition, the tobacco strands of a number that is 90% or more of a total number of the tobacco strands included in the tobacco filler may be fixed to each other integrally.

[0022] The heating-type tobacco may include a mouthpiece portion coaxially coupled to a base end side of the tobacco rod, and the mouthpiece portion may include a cooling portion for cooling a volatile substance emitted from the aerosol-source material.

[0023] In the heating-type tobacco according to the present invention, the mouthpiece portion may further include a support portion that is disposed at a connection end connected to the base end side of the tobacco rod and that is for suppressing the tobacco strands from being pressed into a region on a side of the mouthpiece portion.

[0024] In the heating-type tobacco according to the present invention, the mouthpiece portion may further include a filter portion that is disposed at an inhalation port end side of the mouthpiece portion.

[0025] Note that solutions to problems in the present invention can be employed in combination as far as possible. Advantageous Effects of Invention

[0026] According to the present invention, it is possible to provide a technique that is excellent in terms of the delivery amount of an aerosol, that enables smooth insertion of a heater into a tobacco filler, and that can suppress a tobacco raw material from being pressed by the heater when the heater is inserted into the tobacco filler, in a heating-type tobacco that includes a tobacco rod including the tobacco filler containing the tobacco raw material and an aerosol-source material and wrapping paper that wraps the tobacco filler.

15 Brief Description of Drawings

[0027]

[Fig. 1] Fig. 1 is a view schematically illustrating an internal structure of a heating-type tobacco according to Embodiment 1.

[Fig. 2] Fig. 2 is a view illustrating an internal structure of a tobacco rod according to Embodiment 1.

[Fig. 3] Fig. 3 is a perspective view illustrating an example of a tobacco strand.

[Fig. 4] Fig. 4 is a view for roughly describing an example of a state in which tobacco strands are fixed to each other in a fixed region portion in a tobacco rod according to Embodiment 1.

[Fig. 5] Fig. 5 is a general configuration view of a heating device to which a heating-type tobacco is to be applied.

[Fig. 6] Fig. 6 is a view describing a tobacco rod of a heating-type tobacco in Embodiment 2.

[Fig. 7] Fig. 7 is a view describing a fixed region portion of a tobacco rod according to a modification of Embodiment 2.

[Fig. 8] Fig. 8 is a view describing a tobacco rod of a heating-type tobacco in Embodiment 3.

[Fig. 9] Fig. 9 is a view illustrating a relationship between a tobacco rod and an electric heater in a state in which the tobacco rod of a heating-type tobacco according to Embodiment 3 is attached to a heating device.

[Fig. 10] Fig. 10 is a view describing a relationship between a fixed-portion formation region and a heater insertion region in a cross-section of a tobacco rod according to Embodiment 3.

[Fig. 11] Fig. 11 is a view describing a tobacco rod of a heating-type tobacco in Embodiment 4.

[Fig. 12] Fig. 12 is a view illustrating a state in which tobacco strands are coupled to each other via a tobacco coupling member.

55 Description of Embodiments

[0028] Here, embodiments of a heating-type tobacco according to the present invention will be described on

the basis of the drawings. Dimensions, materials, and shapes of components described in the present embodiments, the relative arrangement thereof, and the like are not intended to limit the technical scope of the invention thereto only unless specific description is provided in particular.

<Embodiment 1>

[Heating-type Tobacco]

[0029] Fig. 1 is a view schematically illustrating an internal structure of a heating-type tobacco 1 according to Embodiment 1. The heating-type tobacco 1 is a tobacco article of a type that heats a tobacco filler without burning the tobacco filler and delivers an aerosol generated at the tobacco filler to a user. Fig. 2 is a view illustrating an internal structure of a tobacco rod according to Embodiment 1.

[0030] The heating-type tobacco 1 includes a tobacco rod 2 and a mouthpiece portion 3 that are arranged by being aligned coaxially. The heating-type tobacco 1 has an inhalation port end 1a that is inserted by a user into the oral cavity during use, and a distal end 1b at an end portion opposite to the inhalation port end 1a. The mouthpiece portion 3 includes a support portion 4, a cooling portion 5, and a filter portion 6 that are arranged by being aligned coaxially. These members are disposed in the order from the distal end side of the mouthpiece portion 3. The support portion 4, the cooling portion 5, and the filter portion 6 of the mouthpiece portion 3 are wrapped integrally by wrapping paper 7. Further, the tobacco rod 2 and the mouthpiece portion 3 are coupled integrally by being wrapped by tip paper 8. The sign CL1 in Fig. 1 indicates the center axis of the heating-type tobacco 1. The tobacco rod 2 and the mouthpiece portion 3 of the heating-type tobacco 1 are disposed coaxially, and the center axis CL1 can be considered as the center axis of the tobacco rod 2 and the mouthpiece portion 3. The sign 2a in Fig. 1 indicates a front end surface of the tobacco rod 2. The sign 2c indicates a rear end surface of the tobacco rod 2.

[0031] During the use of the heating-type tobacco 1, air is inhaled by a user from the distal end 1b to the inhalation port end 1a through the heating-type tobacco 1. The distal end 1b of the heating-type tobacco 1 can be regarded as the distal end or the upstream end of the tobacco rod 2. The inhalation port end 1a of the heating-type tobacco 1 can be regarded as the rear end or the downstream end of the filter portion 6.

[0032] The tobacco rod 2 is disposed at the distal end 1b of the heating-type tobacco 1. The tobacco rod 2 is a bar-shaped member wrapped by wrapping paper 22 such that a side surface of a tobacco filler 21 that contains a tobacco raw material and an aerosol-source material is covered. In the present embodiment, the tobacco filler 21 includes a plurality of tobacco strands 23 each of which is formed in a strand shape and is a tobacco raw

material containing an aerosol-source material. The tobacco strands 23 are, for example, a tobacco raw material that is formed into a sheet-shaped tobacco sheet and shredded into strand shapes. In the present description, "strand shape" denotes a long elongated shape, compared with a cross-section, extending in the longitudinal direction orthogonal to the direction of the cross-section and includes, for example, a strip shape, a string shape, a bar shape, and the like. The aerosol-source material contained in each tobacco strand 23 of the tobacco filler 21 is a substance that generates an aerosol when a volatile substance volatilized and emitted is cooled. The type of the aerosol-source material is not particularly limited, and substances extracted from various natural products can be selected, as appropriate, in accordance with intended uses. Examples of the aerosol-source material are glycerin, propylene glycol, triacetin, 1,3-butanediol, a mixture thereof, and the like. The tobacco strands 23 of the tobacco filler 21 may contain a flavor. The type of the flavor is not particularly limited.

[0033] Fig. 3 is a perspective view illustrating an example of the tobacco strands 23 according to Embodiment 1. In the example illustrated in Fig. 3, the tobacco strand 23 has a strip shape (for example, a thin rectangular parallelepiped shape). At the tobacco filler 21 of the tobacco rod 2 in the present embodiment, a large number (plurality) of tobacco strands 23 are oriented and disposed. The tobacco strands 23 are aligned to extend in the longitudinal direction (the direction of the center axis CL1) of the tobacco rod 2. The sign 23a in Fig. 3 indicates a front end surface of the tobacco strand 23, and the sign 23b indicates a rear end surface of the tobacco strand 23. The front end surface 23a of the tobacco strand 23 is an end surface that faces the distal end 1b of the heating-type tobacco 1. The rear end surface 23b of the tobacco strand 23 is an end surface opposite to the front end surface 23a in the longitudinal direction (extension direction) of the tobacco strand 23. In the present embodiment, the rear end surface 23b of each tobacco strand 23 is disposed to face the front end surface of the support portion 4 disposed at the front end of the mouthpiece portion 3. The sign 23c in Fig. 3 indicates a side surface of the tobacco strand 23. The tobacco strands 23 aligned to extend in the longitudinal direction of the tobacco rod 2 are disposed with respective side surfaces 23c facing each other. The sign 25 in Fig. 2 indicates aerosol flow paths formed between the tobacco strands 23 in the longitudinal direction (the extension direction of the tobacco strands 23) of the tobacco rod 2.

[0034] The tobacco strands 23 are, for example, a tobacco raw material that is formed into a sheet-shaped tobacco sheet and shredded into strand shapes and may be obtained by shredding a so-called reconstituted tobacco sheet into strand shapes. The reconstituted tobacco sheet may be, for example, a sheet obtained by adding a binding agent, a gelling agent, a crosslinking agent, a flavor, a viscosity modifier, a moisturizing agent, a reinforcement material, and the like as additives to a homog-

enized tobacco, kneading the homogenized tobacco, forming the homogenized tobacco into a sheet shape by an appropriate method, such as a paper making method (sheet making method), a casting method (slurry method), a rolling method, or an extruding method, and drying the homogenized tobacco. The homogenized tobacco is a tobacco material that is obtained by pulverizing, grinding, and mixing, for example, a leaf tobacco, dried tobacco leaves, tobacco shreds, an expanded tobacco, a regenerated tobacco, and the like.

[0035] The tobacco filler 21 for the tobacco rod 2 in the present embodiment is characterized in that at least some of the tobacco strands 23 are integrally fixed to each other. A form in which the tobacco strands 23 are fixed to each other by a fixing agent will be described here. The fixing agent is not particularly limited as long as being capable of fixing the tobacco strands 23 to each other, and various materials can be employed as the fixing agent. For example, a single substance, such as calcium carbonate, sodium silicate, agar, gelatin, CMC (carboxymethyl cellulose), PVA (polyvinyl alcohol), EVA (ethylene-vinyl acetate copolymer resin), pectin, gellan gum, guar gum, Arabic gum, xanthan gum, cornstarch, sodium alginate, polyurethane, polyamide, a hydroxyl-containing compound, dextrin or a dextrin derivative, hydroxypropyl cellulose, hydroxyethyl cellulose, hydroxypropyl methylcellulose, methylcellulose, glucomannan, collagen, inulin, soy protein, whey protein, casein, wheat gluten, carrageenin, alginate, propylene glycol alginate, pullulan, curdlan, ceratonia siliqua gum, tara gum, tragacanth gum, zein, psyllium seeds, chitin, chitosan, acacia gum, polyvinylpyrrolidone, polyethylene oxide, or the like, or a mixture of such single substances is used as the fixing agent. Here, from the point of view of ease of handling of the fixing agent, difficulty in attaching the tobacco filler 21 to the electric heater when the electric heater is inserted, heat resistance, and a smoke flavor and the like during heating by the heater, an aqueous solution containing calcium carbonate or an aqueous solution containing sodium silicate (soluble glass) is preferably employed as the fixing agent. The fixing agent may be an aqueous solution containing calcium carbonate and sodium silicate. From the point of view of the strength of the adhesive force and heat resistance in addition to the point of view of the smoke flavor and the like during heating by the heater, it is preferable to use as the fixing agent an aqueous solution that contains at least one of CMC (carboxymethyl cellulose), PVA (polyvinyl alcohol), and EVA (ethylene-vinyl acetate copolymer resin).

[0036] In this example, the fixing agent is added to the entirety of the tobacco filler 21 of the tobacco rod 2. Consequently, all of the tobacco strands 23 included in the tobacco filler 21 are integrated with each other. The region surrounded by the chain line indicated by the sign 24 in Fig. 2 is a fixed region portion. The fixed region portion 24 is a region in which the tobacco strands 23 are fixed to each other integrally via the fixing agent or the like. In the example illustrated in Fig. 2, the fixed re-

gion portion 24 is formed at almost the entirety of the tobacco rod 2 (tobacco filler 21). However, as described later, only some of the tobacco strands 23 included in the tobacco filler 21 may be fixed to each other integrally by the fixing agent.

[0037] Fig. 4 is a view for roughly describing an example of a state in which the tobacco strands 23 are fixed to each other in the fixed region portion 24 in the tobacco rod 2 (tobacco filler 21) according to Embodiment 1. In the example illustrated in Fig. 4, the tobacco strands 23 are fixed (bonded) to each other via a fixing agent 27. In the form illustrated in Fig. 4, the fixing agent 27 is a fixing agent sprayed onto the tobacco strands 23 in the production process of the tobacco rod 2 and cured. In the form illustrated in Fig. 4, the fixing agent 27 is dotted in a region of the tobacco rod 2 (tobacco filler 21) and point-bonds (also referred to as "point-fix") one tobacco strand 23 to the other tobacco strand 23. The point bonding (point-fixing) referred here includes not only a form in which one tobacco strand 23 is bonded (fixed) in a dot manner to the other single tobacco strand 23 but also a form in which one tobacco strand 23 is bonded (fixed) to a plurality of the other tobacco strands 23 collectively. One tobacco strand 23 and the other tobacco strands 23 may be bonded (fixed) to each other at a plurality of portions of the tobacco rod 2 in the longitudinal direction by the fixing agent 27.

[0038] In the present embodiment, the fixing agent 27 can point-bond the tobacco strands 23 to each other in a dot manner due to the fixing agent 27 being dotted in the fixed region portion 24 of the tobacco rod 2 (tobacco filler 21). It is possible by thus point-bonding the tobacco strands 23 to each other to integrally fix the tobacco strands 23 to each other while forming (remaining as gap portions) the aerosol flow paths 25 between the tobacco strands 23 aligned in the tobacco rod 2 (tobacco filler 21). When a form in which the fixing agent 27 is thus dotted in the fixed region portion 24 is employed, it is particularly suitable to use CMC (carboxymethyl cellulose), PVA (polyvinyl alcohol), EVA (ethylene-vinyl acetate copolymer resin), or the like as the fixing agent 27. These fixing agents have very high adhesive forces and thus can bond the tobacco strands 23 to each other easily in a dot manner.

[0039] From the point of view of ensuring a larger number of gap spaces that are usable as the aerosol flow paths 25 in the tobacco rod 2 (tobacco filler 21), it is preferable to dot the fixing agent 27 by, for example, spraying the fixing agent 27 onto the fixed region portion 24 but is not limited thereto. For example, the tobacco strands 23 may be fixed to each other by adding, to the fixed region portion 24, the fixing agent 27 that contains calcium carbonate or sodium silicate to the fixed region portion 24 to thereby form an adhesive layer in the fixed region portion 24.

[0040] Next, the mouthpiece portion 3 will be described. The support portion 4 is a segment positioned on the front end side of the mouthpiece portion 3. The

support portion 4 is positioned on the immediate downstream side of the tobacco rod 2 and disposed in a state of being in contact with the rear end of the tobacco rod 2. The support portion 4 may be, for example, a hollow cellulose-acetate pipe body. In other words, the support portion 4 may be a columnar cellulose-acetate fiber bundle with a center hole formed at the center of a cross-section of the cellulose-acetate fiber bundle to pass therethrough. As another form, the support portion 4 may be a paper filter, a paper pipe, or the like filled with cellroll fibers. A paper pipe having a certain thickness can function effectively as the support portion 4. The support portion 4 is a segment for preventing the tobacco filler 21 from being pressed into the downstream side toward the cooling portion 5 in the heating-type tobacco 1 when an electric heater of a heating device to which the heating-type tobacco 1 is applied is inserted into the tobacco rod 2. The support portion 4 also functions as a spacer for spacing the cooling portion 5 of the heating-type tobacco 1 from the tobacco rod 2.

[0041] The cooling portion 5 is positioned on the immediate downstream side of the support portion 4 and disposed in contact with the rear end of the support portion 4. During the use of the heating-type tobacco 1, a volatile substance emitted from the tobacco rod 2 (tobacco filler 21) flows along the cooling portion 5 toward the downstream side. The volatile substance that has been emitted from the tobacco rod 2 (tobacco filler 21) is cooled at the cooling portion 5 and thereby forms an aerosol that is to be inhaled by a user. In the form illustrated in Fig. 1, the cooling portion 5 is formed of a hollow paper pipe having an air hole 5a through which outside air can be introduced. The cooling portion 5, however, may have no air hole 5a. In addition, the cooling portion 5 may include a heat absorbing agent disposed not to obstruct the flow of the volatile substance and the aerosol. The cooling portion 5 may be formed by, for example, a filter material having a large number of flow paths (through holes) formed in the longitudinal direction (axial direction) of the mouthpiece portion 3.

[0042] The filter portion 6 is a segment that is positioned at the rear end of the mouthpiece portion 3, that is, on the side of the inhalation port end 1a. The filter portion 6 may be positioned on the immediate downstream side of the cooling portion 5 and disposed in a state of being in contact with the rear end of the cooling portion 5. In the form illustrated in Fig. 1, the filter portion 6 may include, for example, a filter material that is formed by cellulose-acetate fibers formed in a columnar shape. In addition, the filter portion 6 may be a center hole filter or a paper filter filled with cellulose fibers or may be a paper pipe containing no filtering medium. The filter portion 6 may be formed by any of a solid filter material including a filtering medium, a center hole filter, a paper filter, and a paper pipe including no filtering medium or may be formed by combining a plurality of them selectively.

[0043] Fig. 5 is a schematic configuration view of a

heating device 100 to which the heating-type tobacco 1 according to Embodiment 1 is to be applied. The heating device 100 includes a housing 102 that is a housing for housing various types of constituent parts. In the housing 102, an electric heater 103, a controller (control unit) 104, a power source 105, and the like are housed. The housing 102 has a housing cavity 107 including an opening portion 106 into which the tobacco rod 2 of the heating-type tobacco 1 is to be inserted. The housing cavity 107 is a columnar cavity portion and can house the tobacco rod 2. **[0044]** As illustrated in Fig. 5, the electric heater 103 is provided in the housing cavity 107. The electric heater 103 has a conical shape, vertically projects from a center portion of a bottom portion 107a of the housing cavity 107 toward the opening portion 106 in a vertical manner, and is tapered gradually from a base end portion 103a toward a leading end portion 103b. The center axis of the electric heater 103 is coaxial with the center axis of the housing cavity 107. The type of the electric heater 103 is not particularly limited. As the electric heater 103, for example, a steel material on which a heating wire (for example, nichrome, iron chrome, iron nickel, and the like) is laid and disposed, or a ceramic heater or the like can be used.

[0045] Here, when the heating-type tobacco 1 is to be used, the electric heater 103 is fitted or inserted into the tobacco filler 21 from the side of the front end surface 2a of the tobacco rod 2 of the heating-type tobacco 1, thereby attaching the tobacco rod 2 to the housing cavity 107 of the heating device 100. In the present embodiment, the tobacco strands 23 of the tobacco filler 21 of the tobacco rod 2 are integrated with each other by the fixing agent. Accordingly, even when the front end surfaces 23a of the tobacco strands 23 are pressed by the electric heater 103 when the electric heater 103 is fitted or inserted from the side of the front end surface 2a of the tobacco rod 2, the tobacco strands 23 that have come into contact with the electric heater 103 can be suppressed from being pressed into the base end side (for example, the side of the support portion 4 of the mouthpiece portion 3) of the tobacco rod 2. That is, it is possible to suppress displacement of some of the tobacco strands 23 of the tobacco rod 2 in the longitudinal direction of the tobacco rod 2 from occurring and the tobacco strands 23 from coming off from the rear end surface 2b of the tobacco rod 2 during attachment of the tobacco rod 2 to the housing cavity 107 of the heating device 100.

[0046] In addition, according to the heating-type tobacco 1 in the present embodiment, the tobacco strands 23 of the tobacco rod 2 are oriented and disposed to extend in the longitudinal direction (the direction of the center axis CL1) of the tobacco rod 2, and the tobacco strands 23 are aligned to extend in the longitudinal direction (the direction of the center axis CL1) of the tobacco rod 2. Therefore, an aerosol that is generated as a result of the aerosol-source material contained in each of the tobacco strands 23 being volatilized when heated by the electric heater 103 is not easily condensed due to contact with

the tobacco strands 23 and is not easily filtered by the tobacco strands 23. Therefore, according to the heating-type tobacco 1 in the present embodiment, it is possible to increase the delivery amount of the aerosol into the oral cavity of a user more than before.

[0047] In addition, according to the heating-type tobacco 1 in the present embodiment, due to the tobacco strands 23 of the tobacco rod 2 being aligned in the longitudinal direction (the direction of the center axis CL1) of the tobacco rod 2, fitting or insertion of the electric heater 103 from the side of the distal end 1b of the tobacco rod 2 is easy, compared with when a tobacco raw material is conventionally oriented randomly. Consequently, the electric heater 103 is easily fitted or inserted into the tobacco rod 2, and it is possible to provide the heating-type tobacco 1 excellent for a user in terms of usability. As described above, in the present embodiment, it is possible to provide the heating-type tobacco 1 that is excellent in terms of the delivery amount of the aerosol, that enables smooth insertion of the electric heater 103 into the tobacco filler 21, and that can suppress the tobacco strands 23 from being pressed by the electric heater 103 when the electric heater 103 is inserted into the tobacco filler 21.

[0048] Furthermore, according to the heating-type tobacco 1 in the present embodiment, it is possible to form the aerosol flow paths 25 extending in the longitudinal direction of the tobacco rod 2 between the tobacco strands 23. It is thus possible to cause the aerosol generated as a result of the tobacco strands 23 being heated by the electric heater 103 to circulate along the aerosol flow paths 25. As a result, condensation and filtration of the aerosol generated during heating by the electric heater 103 are further suppressed from occurring easily in the tobacco rod 2. In other words, by smoothly circulating the aerosol through the aerosol flow paths 25 formed between the side surfaces 23c of the tobacco strands 23, it is possible to increase efficiency in the delivery of the aerosol during use.

[0049] Regarding the embodiment described with Fig. 4, a form in which the fixed region portion 24 is formed in the tobacco rod 2 over the entire length of the tobacco rod 2 has been described. However, the fixed region portion 24 may be formed partially only at a specific portion that is a portion of the tobacco rod 2 in the longitudinal direction. For example, the fixed region portion 24 may be formed at a rear end portion of the tobacco rod 2. That is, respective rear ends of the tobacco strands 23 may be fixed to each other by adding (for example, spraying) the fixing agent 27 onto the rear end surface 23b of each of the tobacco strands 23 of the tobacco rod 2. In addition, regarding the embodiment described with Fig. 4, a form in which the fixed region portion 24 is formed at the entire region of the cross-section of the tobacco rod 2 has been described. However, the fixed region portion 24 may be formed at only a portion of the cross-section of the tobacco rod 2.

[0050] In the aforementioned embodiment, an exam-

ple in which all of the tobacco strands 23 included in the tobacco rod 2 (tobacco filler 21) are integrally fixed to each other has been described. However, only some of the tobacco strands 23 included in the tobacco filler 21 may be partially fixed to each other. In this case, from the point of view of obtaining the above-described effects, it is preferable that the tobacco strands 23 of a number that is 50% or more of the total number of the tobacco strands 23 included in the tobacco rod 2 (tobacco filler 21) be fixed to each other integrally. It is more preferable that the tobacco strands 23 of a number that is 70% or more of the total number of the tobacco strands 23 included in the tobacco rod 2 (tobacco filler 21) be fixed to each other integrally. It is particularly preferable that the tobacco strands 23 of a number that is 90% or more of the total number thereof are fixed to each other integrally.

<Embodiment 2>

[0051] Next, the heating-type tobacco 1 according to Embodiment 2 will be described. Fig. 6 is a view describing the tobacco rod 2 of the heating-type tobacco 1 in Embodiment 2. A large number (plurality) of the tobacco strands 23 included in the tobacco filler 21 are also oriented and disposed in the tobacco rod 2 in the present embodiment. The tobacco strands 23 are the same as those in Embodiment 1 in terms of being aligned to extend in the longitudinal direction (the direction of the center axis CL1) of the tobacco rod 2. In the following description, the same components as those in Embodiment 1 will not be described in detail by giving the same reference signs as those in Embodiment 1 thereto. Regarding Embodiment 1, an example in which the fixing agent is added to the entirety of the tobacco filler 21 of the tobacco rod 2 has been described. Regarding Embodiment 2, an example in which the fixing agent is added to only a partial region of the tobacco filler 21 of the tobacco rod 2 will be described.

[0052] In the tobacco rod 2 in Embodiment 2, the fixed region portion 24 in which at least some of the tobacco strands 23 are fixed to each other integrally is formed at only a portion on the downstream end side of the tobacco rod 2. In the fixed region portion 24, the rear ends of the tobacco strands 23 aligned to extend in the longitudinal direction (the direction of the center axis CL1) of the tobacco rod 2 are fixed to each other integrally by the fixing agent. For example, the fixed region portion 24 may be formed such that the entire surface of the rear end surface 2b of the tobacco rod 2 is covered by applying the fixing agent, such as an aqueous solution containing calcium carbonate, an aqueous solution (soluble glass) containing sodium silicate, or the like, to the entire surface of the rear end surface 2b of the tobacco rod 2. Naturally, as the fixing agent for fixing the rear ends of the tobacco strands 23 to each other to form the fixed region portion 24, CMC (carboxymethyl cellulose), PVA (polyvinyl alcohol), EVA (ethylene-vinyl acetate copolymer resin), or the like may be used, or the other fixing agents may be

used. In the example illustrated in Fig. 6, the fixed region portion 24 is formed at the rear end portion of the tobacco rod 2 in the longitudinal direction (the direction of the center axis CL1) by fixing the rear ends of the tobacco strands 23 to each other by the fixing agent. The fixed region portion 24, however, may be formed at the other portion of the tobacco rod 2 in the longitudinal direction.

[0053] Even when, as with the tobacco rod 2 in the present embodiment, the fixed region portion 24 is formed at only a partial specific portion of the tobacco rod 2 in the longitudinal direction with the tobacco strands 23 fixed to each other integrally in the fixed region portion 24, the same effects as those of the heating-type tobacco 1 according to Embodiment 1 are exerted.

[0054] In addition, by forming the fixed region portion 24 at only a partial specific portion of the tobacco rod 2 in the longitudinal direction, as with the tobacco rod 2 in the present embodiment, it is possible to form the aerosol flow paths 25 extending in the longitudinal direction of the tobacco rod 2 between the tobacco strands 23 in the other sections (regions) in which the fixed region portion 24 is not formed in the tobacco rod 2. That is, by forming the fixed region portion 24 only at a partial specific portion of the tobacco rod 2 in the longitudinal direction, as in the present embodiment, it becomes easier to ensure the volume of the aerosol flow paths 25 than when the fixed region portion 24 is formed in the tobacco rod 2 over the entire length of the tobacco rod 2. As a result, it is possible to increase efficiently in the delivery of an aerosol to the oral cavity.

<Modification>

[0055] Next, the tobacco rod 2 according to a modification of Embodiment 2 will be described. Fig. 7 is a view describing the fixed region portion 24 of the tobacco rod 2 according to the modification of Embodiment 2. With Fig. 6, a form in which the fixed region portion 24 is formed in the entire region of the cross-section of the tobacco rod 2 has been described. In the present modification, the fixed region portion 24 is formed to cover only a portion of the cross-section of the tobacco rod 2. In Fig. 7, a cross-section of the fixed region portion 24 is illustrated, and a region that is occupied by the fixed region portion 24 in the cross-section of the tobacco rod 2 is indicated by lane hatching. As illustrated in Fig. 7, the fixed region portion 24 is arranged in a mesh shape or a lattice shape along the cross-section of the tobacco rod 2 in the present modification. In Fig. 7, illustration of the tobacco strands 23 disposed on the tobacco rod 2 is omitted. By forming the fixed region portion 24 to cover only a portion of the cross-section of the tobacco rod 2, as with the tobacco rod 2 according to the present modification, it is possible to suppress the aerosol flow paths 25 of the tobacco rod 2 from easily blocked by the fixed region portion 24. As a result, it is possible to increase efficiently in the delivery of an aerosol during use. In the present modification, the other shapes may be employed as the cross-sectional

shape of the fixed region portion 24.

<Embodiment 3>

[0056] Next, the heating-type tobacco 1 according to Embodiment 3 will be described. Fig. 8 is a view describing the tobacco rod 2 of the heating-type tobacco 1 in Embodiment 3. The tobacco rod 2 of the heating-type tobacco 1 in Embodiment 3 differs from that in Embodiment 2, in which the fixed region portion 24 is formed at the entire surface of the cross-section of the tobacco rod 2, in terms of that the fixed region portion 24 is formed in a predetermined specific region that is a portion of the cross-section of the tobacco rod 2. Here, in the cross-section of the tobacco rod 2 in the present embodiment, a region in which the fixed region portion 24 is formed is referred to as a fixed-portion formation region RB. In the present embodiment, the fixed-portion formation region RB in which the fixed region portion 24 is formed in the cross-section of the tobacco rod 2 is set as a region including a heater insertion region RH into which the electric heater 103 is inserted when the tobacco rod 2 of the heating-type tobacco 1 is attached to the heating device 100.

[0057] Fig. 9 is a view illustrating a relationship between the tobacco rod 2 and the electric heater 103 in a state in which the tobacco rod 2 of the heating-type tobacco 1 according to Embodiment 3 is attached to the heating device 100. In Fig. 9, illustration of components other than the electric heater 103 of the heating device 100 is omitted. Here, the heater insertion region RH is defined as an occupied area of a portion at which an area occupied in the cross-section of the tobacco rod 2 by the electric heater 103 when the electric heater 103 is fitted or inserted into the tobacco rod 2 is largest. Here, the electric heater 103 of the heating device 100 has a conical shape and has the largest diameter at the base end portion 103a joined to the bottom portion 107a. Accordingly, in the present embodiment, the heater insertion region RH corresponds to a circular region having a diameter that is substantially equal to the diameter of the base end portion 103a of the electric heater 103.

[0058] Fig. 10 is a view describing a relationship between the fixed-portion formation region RB and the heater insertion region RH in the cross-section of the tobacco rod 2 according to Embodiment 3. Here, the center axis of the electric heater 103 is coaxial with the center axis of the housing cavity 107 of the heating device 100. The center axis CL1 of the tobacco rod 2 attached to the housing cavity 107 is also designed to be coaxial with the center axis of the electric heater 103. Accordingly, as illustrated in Fig. 10, each of the fixed-portion formation region RB and the heater insertion region RH is formed as a circular region having the center axis CL1 of the tobacco rod 2 as its center. In the present embodiment, a diameter Db of the fixed-portion formation region RB is set to a dimension more than or equal to a diameter Dh of the heater insertion region RH (in the example in

Fig. 10, the diameter D_b is illustrated as a dimension larger than the diameter D_h). Consequently, it is possible to form the fixed-portion formation region RB such that the fixed-portion formation region RB includes the heater insertion region RH in the cross-section of the tobacco rod 2.

[0059] As described above, according to the tobacco rod 2 in the present embodiment, the fixed-portion formation region RB in the cross-section of the tobacco rod 2 is formed as a region including the heater insertion region RH. Therefore, the same effects as those of the tobacco rod 2 according to Embodiment 2 are exerted without the fixed region portion 24 being formed at the entirety of the cross-section of the tobacco rod 2. That is, in attachment of the tobacco rod 2 to the housing cavity 107 of the heating device 100, the tobacco strands 23 of the tobacco rod 2 are suitably suppressed from projecting or coming off from the rear end surface 2b of the tobacco rod 2 due to being pressed by the electric heater 103. The fixing agent for fixing the tobacco strands 23 to each other in the fixed region portion 24 is not particularly limited, and the above-described various fixing agents can be employed, as appropriate.

<Embodiment 4>

[0060] Next, the heating-type tobacco 1 according to Embodiment 4 will be described. Fig. 11 is a view describing the tobacco rod 2 of the heating-type tobacco 1 in Embodiment 4. The tobacco rod 2 of the heating-type tobacco 1 in Embodiment 4 is characterized in that at least some of the tobacco strands 23 are coupled to each other via a tobacco coupling member 26 formed by a tobacco raw material. Here, an example in which all of the tobacco strands 23 included in the tobacco filler 21 of the tobacco rod 2 are coupled to each other via the tobacco coupling member 26 will be described. In the example illustrated in Fig. 11, the tobacco coupling member 26 couples portions on the rear end side of the tobacco strands 23 to each other.

[0061] Fig. 12 is a view illustrating a state in which the tobacco strands 23 are coupled to each other via the tobacco coupling member 26. In Fig. 12, a state before the tobacco strands 23 are wrapped by the wrapping paper 22 is illustrated. In the example illustrated in Fig. 12, the tobacco strands 23 are coupled to each other by the tobacco coupling member 26. The tobacco coupling member 26 is a belt-shaped member formed by a tobacco raw material. In the present embodiment, the tobacco coupling member 26 is formed by, for example, shredding a reconstituted tobacco sheet into belt shapes. The tobacco coupling member 26 may include an aerosol-source material, as with the tobacco strands 23. The method of coupling the tobacco strands 23 by the tobacco coupling member 26 is not particularly limited. For example, the tobacco strands 23 may be coupled to each other via the tobacco coupling member 26 by press fitting the tobacco coupling member 26 to the tobacco strands 23.

The tobacco rod 2 can be formed by enclosing the tobacco strands 23 coupled to each other via the tobacco coupling member 26, as illustrated in Fig. 12, by the wrapping paper 22 and forming the tobacco strands 23 into a rod shape.

[0062] The tobacco strands 23 are also coupled to each other integrally via the tobacco coupling member 26 in the tobacco rod 2 in the present embodiment and thus exert the same effects as those in each of the above-described embodiments. In addition, according to the tobacco rod 2 in the present embodiment, it is possible to form the aerosol flow paths 25 extending in the longitudinal direction of the tobacco rod 2 between the tobacco strands 23 and thus possible to increase efficiency in the delivery of an aerosol.

[0063] Regarding the above-described embodiments, examples in each of which the electric heater 103 of the heating device 100 has a conical shape have been described. The shape of the electric heater 103 is, however, not particularly limited. For example, the electric heater 103 may have a frustoconical shape (truncated cone shape) or may have a blade shape. In addition, the electric heater 103 may have the other shapes.

[0064] Embodiments according to the present invention have been described above. The heating-type tobacco according to the present invention is, however, not limited to those in the embodiments.

Reference Signs List

[0065]

- | | |
|----|-------------------------|
| 1 | heating-type tobacco |
| 2 | tobacco rod |
| 3 | filter |
| 4 | support portion |
| 5 | cooling portion |
| 6 | mouthpiece portion |
| 21 | tobacco filler |
| 22 | wrapping paper |
| 23 | tobacco strand |
| 24 | fixed portion |
| 25 | aerosol flow path |
| 26 | tobacco coupling member |

Claims

1. A heating-type tobacco comprising a tobacco rod that includes a tobacco filler and wrapping paper that wraps the tobacco filler,

wherein the tobacco filler includes a plurality of tobacco strands each of which is formed in a strand shape and is a tobacco raw material containing an aerosol-source material, and
wherein the plurality of tobacco strands are aligned and disposed to extend in a longitudinal

direction of the tobacco rod, and at least some of the tobacco strands are fixed to each other integrally.

2. The heating-type tobacco according to claim 1, wherein a fixed region portion in which at least some of the tobacco strands are fixed to each other integrally is formed at only a specific portion of the tobacco rod in the longitudinal direction.
3. The heating-type tobacco according to claim 2, wherein the fixed region portion is formed at a portion on a rear end side of the tobacco rod.
4. The heating-type tobacco according to claim 1, wherein a fixed region portion in which at least some of the tobacco strands are fixed to each other integrally is formed in the tobacco rod over the entire length of the tobacco rod.
5. The heating-type tobacco according to any one of claims 2 to 4, wherein, in the fixed region portion, at least some of the tobacco strands are point-bonded to each other.
6. The heating-type tobacco according to claim 5, wherein, in the fixed region portion, a fixing agent that point-bonds at least some of the tobacco strands to each other is dotted.
7. The heating-type tobacco according to claim 6, wherein the fixing agent includes at least one of carboxymethyl cellulose, polyvinyl alcohol, and ethylene-vinyl acetate copolymer resin.
8. The heating-type tobacco according to any one of claims 2 to 4, wherein the fixed region portion is formed to cover only a portion of a cross-section of the tobacco rod.
9. The heating-type tobacco according to claim 8, wherein the fixed region portion is formed in only a specific region that is a portion of the cross-section of the tobacco rod, and wherein the specific region is set in the cross-section of the tobacco rod as a region that includes a heater insertion region into which a heater is inserted when the heating-type tobacco is attached to a heating device.
10. The heating-type tobacco according to claim 8 or claim 9, wherein the fixed region portion is arranged in a mesh shape or a lattice shape along the cross-section of the tobacco rod.
11. The heating-type tobacco according to claim 2, 3, 8, or 9, wherein a fixing agent that fixes at least some

of the tobacco strands to each other in the fixed region portion includes at least one of calcium carbonate and sodium silicate.

12. The heating-type tobacco according to claim 1, wherein at least some of the tobacco strands are coupled to each other via a tobacco coupling member formed by a tobacco raw material.
13. The heating-type tobacco according to claim 12, wherein the tobacco coupling member couples portions on a rear end side of the tobacco strands to each other.
14. The heating-type tobacco according to any one of claims 1 to 13, wherein the tobacco strands of a number that is 50% or more of a total number of the tobacco strands included in the tobacco filler are fixed to each other integrally.
15. The heating-type tobacco according to any one of claims 1 to 13, wherein the tobacco strands of a number that is 70% or more of a total number of the tobacco strands included in the tobacco filler are fixed to each other integrally.
16. The heating-type tobacco according to any one of claims 1 to 13, wherein the tobacco strands of a number that is 90% or more of a total number of the tobacco strands included in the tobacco filler are fixed to each other integrally.
17. The heating-type tobacco according to any one of claims 1 to 16, wherein the heating-type tobacco includes a mouthpiece portion that is coaxially coupled to a base end side of the tobacco rod, and wherein the mouthpiece portion includes a cooling portion for cooling a volatile substance emitted from the aerosol-source material.
18. The heating-type tobacco according to claim 17, wherein the mouthpiece portion further includes a support portion that is disposed at a connection end connected to the base end side of the tobacco rod and that is for suppressing the tobacco strands from being pressed into a region on a side of the mouthpiece portion.
19. The heating-type tobacco according to claim 17 or claim 18, wherein the mouthpiece portion further includes a filter portion that is disposed at an inhalation port end side of the mouthpiece portion.

FIG. 1

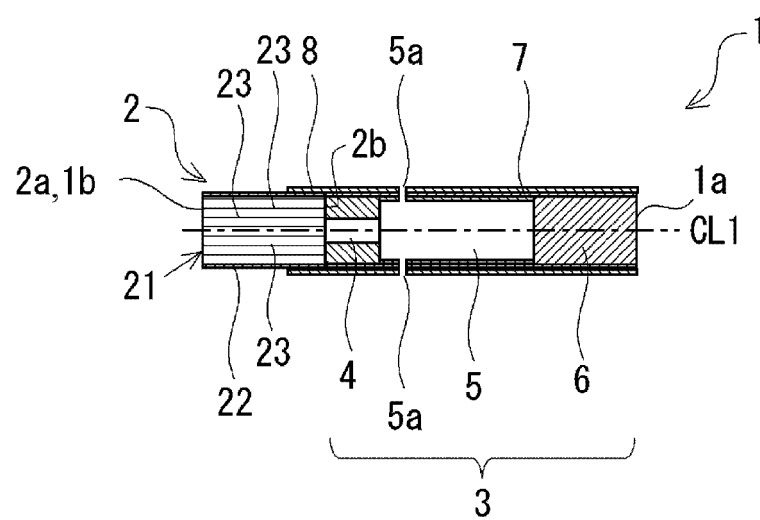


FIG. 2

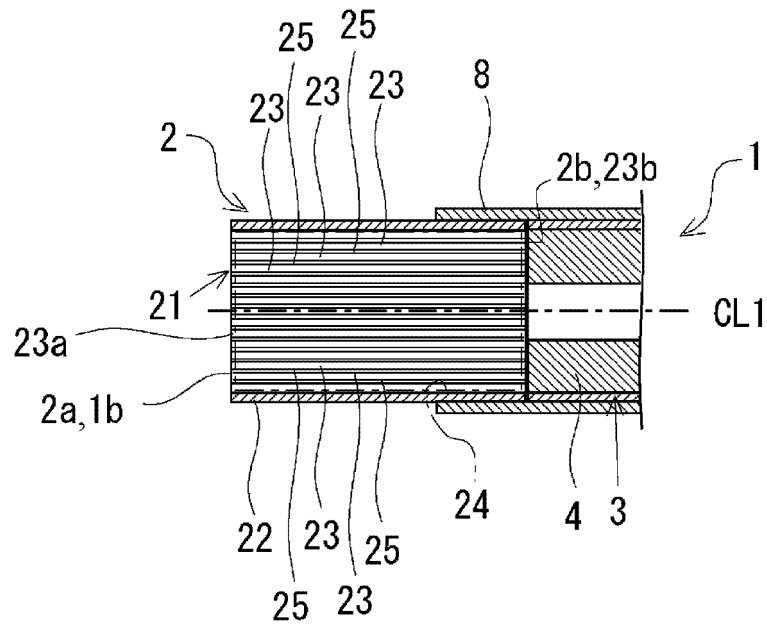


FIG. 3

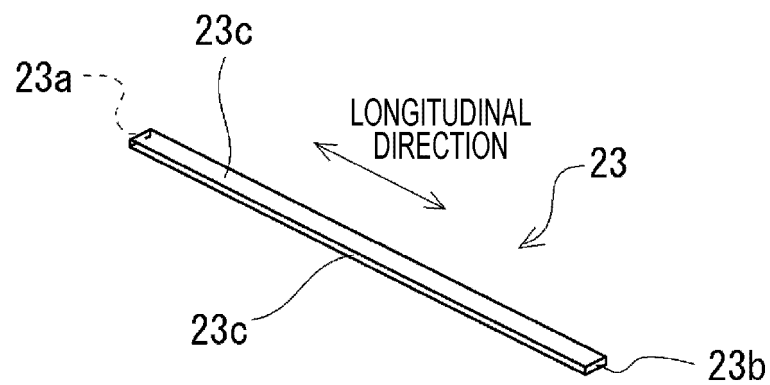


FIG. 4

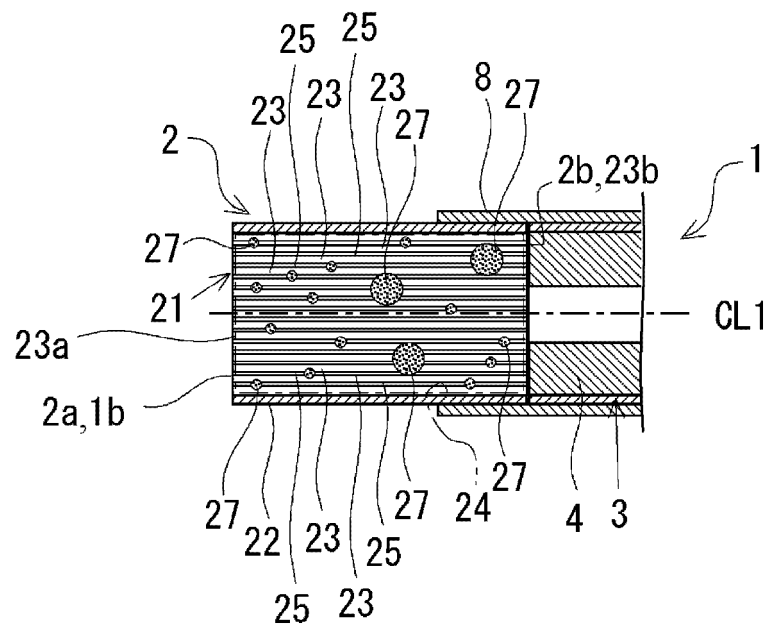


FIG. 5

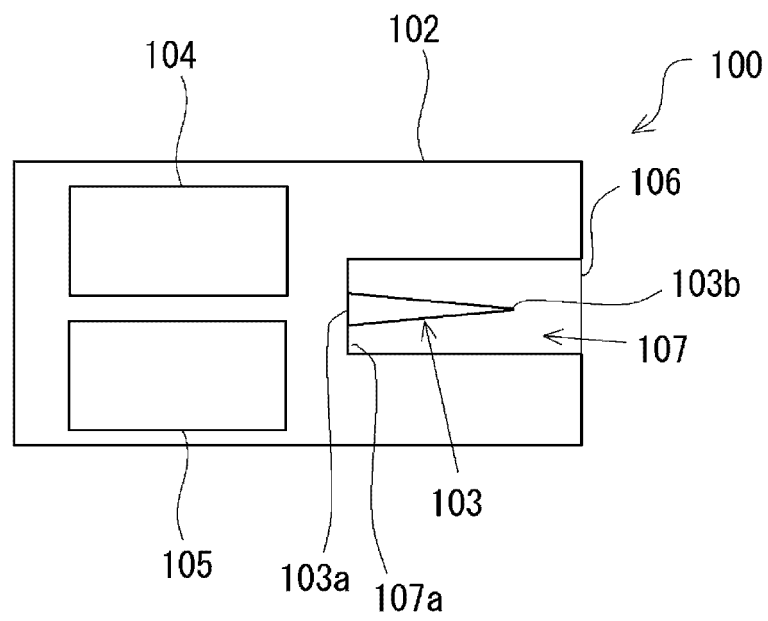


FIG. 6

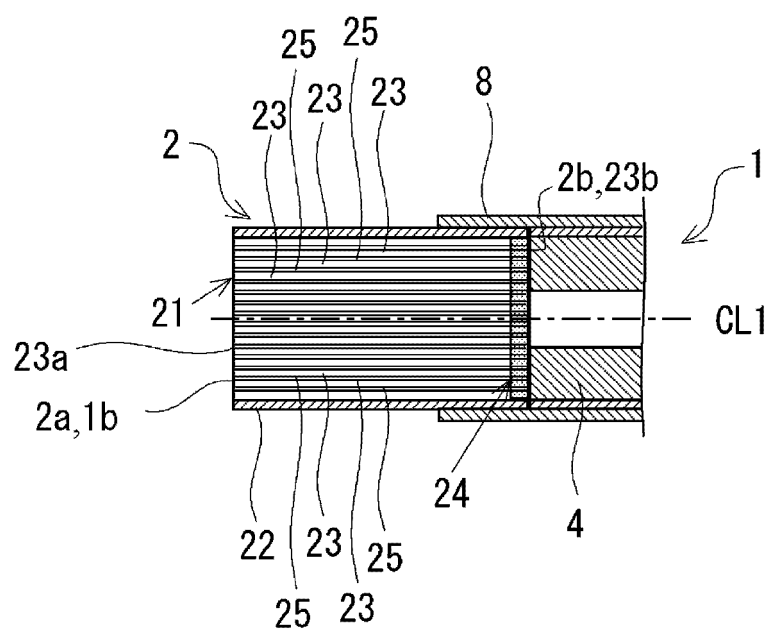


FIG. 7

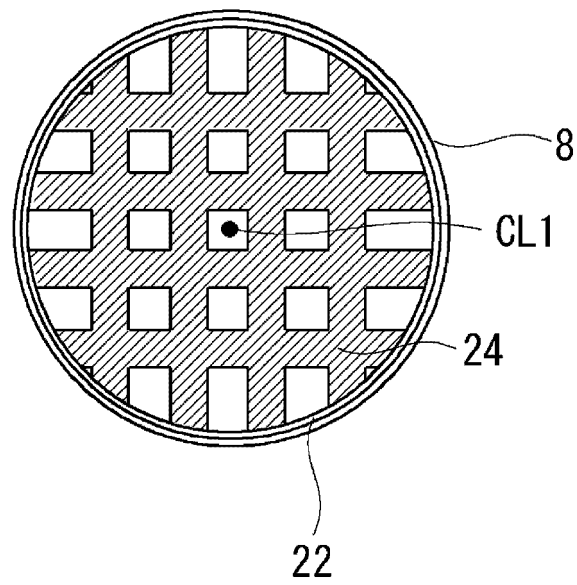


FIG. 8

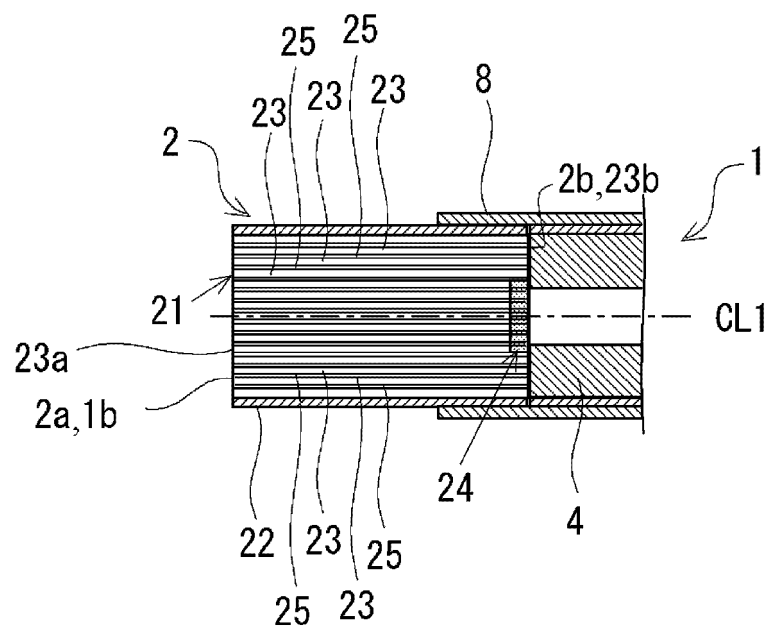


FIG. 9

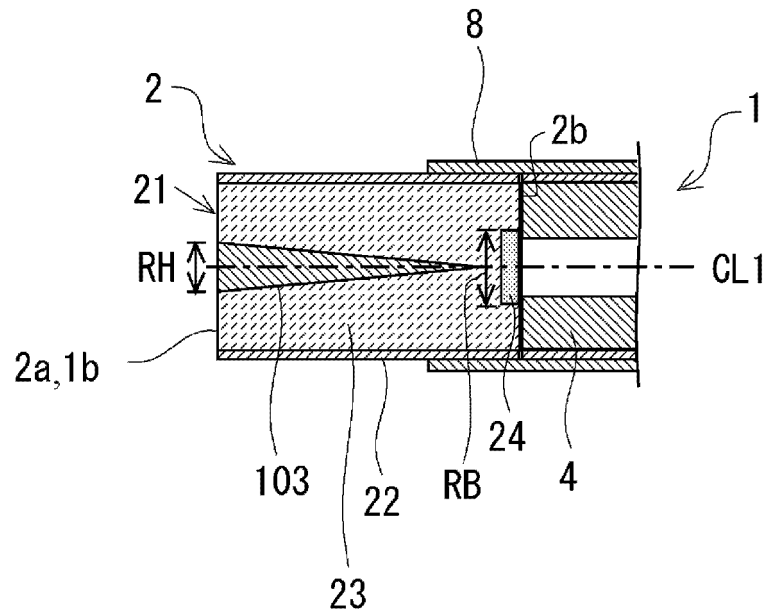


FIG. 10

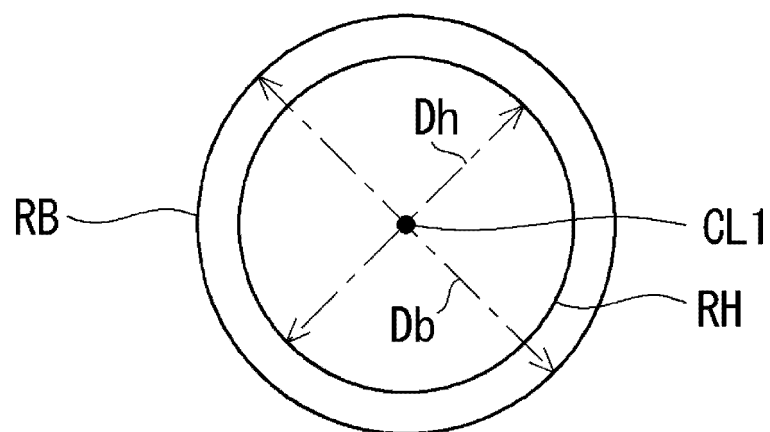


FIG. 11

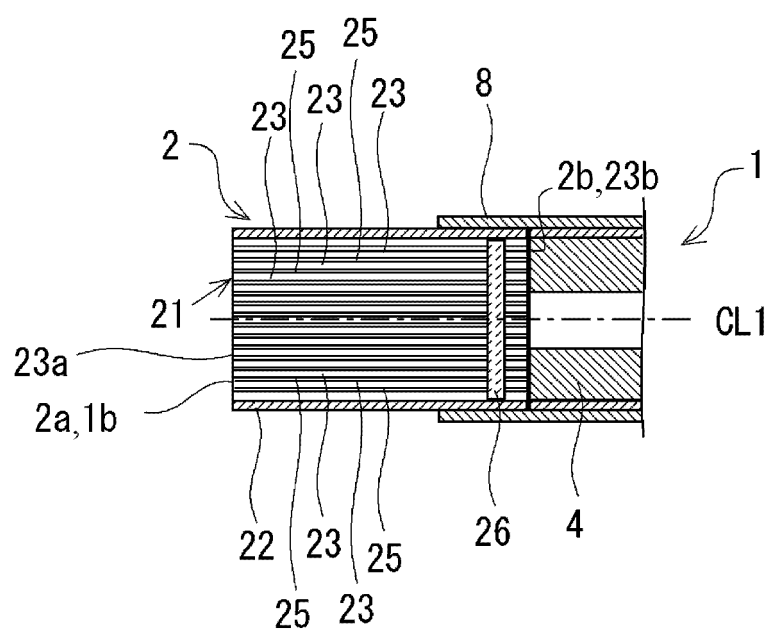
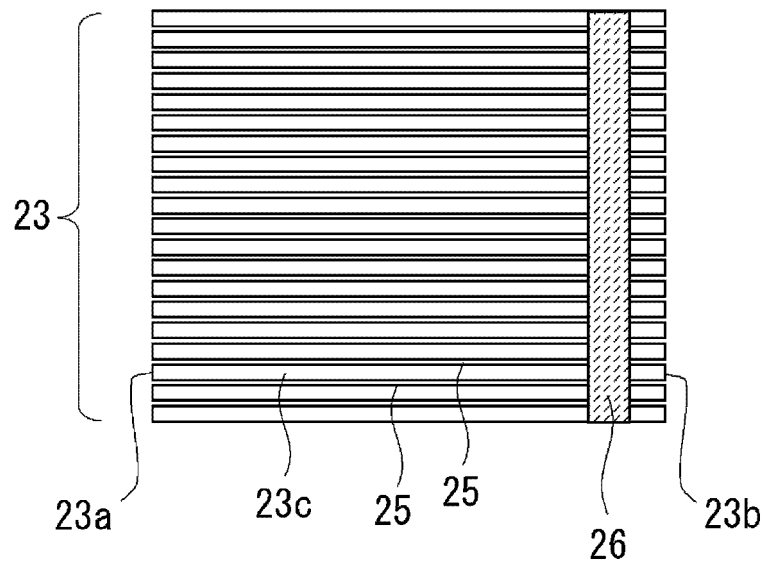


FIG. 12



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2019/013707

A. CLASSIFICATION OF SUBJECT MATTER
Int. Cl. A24F47/00 (2006.01) i

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)
Int. Cl. A24F47/00

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 1971-2019
Registered utility model specifications of Japan 1996-2019
Published registered utility model applications of Japan 1994-2019

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.
Y A	JP 2015-509706 A (PHILIP MORRIS PRODUCTS S.A.) 02 April 2015, paragraphs [0044]-[0052], [0079]-[0083], fig. 1 & US 2015/0027458 A1, paragraphs [0044]-[0053], [0086]-[0091], fig. 1 & WO 2013/104616 A1 & EP 2802225 A1 & CN 104039179 A & KR 10-2014-0116407 A	1-8, 10-19 9
Y	US 2017/0238607 A1 (R.J. REYNOLDS TOBACCO COMPANY) 24 August 2017, paragraph [0069] & WO 2017/145095 A1 & EP 3419444 A1 & CN 108882747 A & KR 10-2018-0122365 A	1-8, 10-19
Y	WO 2017/137857 A1 (PHILIP MORRIS PRODUCTS S.A.) 17 August 2017, page 4, line 29 to page 6, line 6 & TW 201728272 A & AR 107558 A1	1-8, 10-19



Further documents are listed in the continuation of Box C.



See patent family annex.

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Date of the actual completion of the international search
05.06.2019

Date of mailing of the international search report
18.06.2019

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2019/013707

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	WO 2018/230003 A1 (TOA INDUSTRY CO., LTD.) 20 December 2018, paragraphs [0011]-[0051], fig. 1-8 & JP 3212228 U & CN 109414064 A	17-19 1-16

Form PCT/ISA/210 (continuation of second sheet) (January 2015)

REFERENCES CITED IN THE DESCRIPTION

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- JP 6017546 B [0003]
- JP 6000451 B [0003]
- JP 62272962 A [0003]