



(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
17.02.2021 Bulletin 2021/07

(51) Int Cl.:
A24F 47/00^(2020.01) A24D 1/02^(2006.01)

(21) Application number: **18917474.1**

(86) International application number:
PCT/JP2018/017407

(22) Date of filing: **01.05.2018**

(87) International publication number:
WO 2019/211890 (07.11.2019 Gazette 2019/45)

(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

(71) Applicant: **JAPAN TOBACCO INC.**
Minato-ku
Tokyo 105-6927 (JP)

(72) Inventors:
• **OSAWA, Noriko**
Tokyo 130-8603 (JP)
• **AIZAWA, Ryota**
Tokyo 130-8603 (JP)

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

(54) **ROLLING PAPER FOR NON-COMBUSTION-HEATING-TYPE SMOKING PRODUCT, NON-COMBUSTION-HEATING-TYPE SMOKING PRODUCT, AND ELECTRIC-HEATING-TYPE SMOKING SYSTEM**

(57) Provided is rolling paper for a non-combustion-heating-type smoking product, the rolling paper having a section in which a heat-sensitive material is added on a surface that serves as an outer circumferential surface of a non-combustion-heating-type smoking product, wherein a color difference ΔE^* between the color of, be-

fore heating the rolling paper, the section in which the heat-sensitive material is added and the color of, after heating the rolling paper for five minutes at 200°C, the section in which the heat-sensitive material is added is 15 or greater.

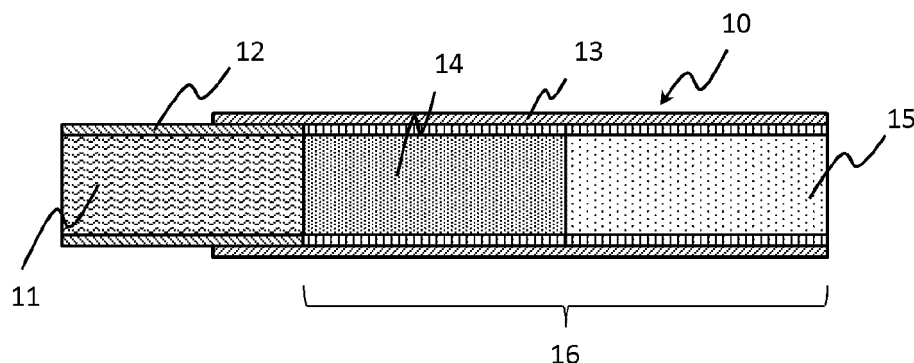


Fig.1

Description

[Technical Field]

5 **[0001]** The present invention relates to a wrapping paper for a non-combustion-heating-type smoking product, a non-combustion-heating-type smoking product, and an electric-heating-type smoking system.

[Background Art]

10 **[0002]** A non-combustion-heating-type smoking product of a type, in which heating is performed from the periphery of a tobacco rod including shredded tobacco and in which a volatile component is delivered to a user, is known. In the non-combustion-heating-type smoking product, the tobacco rod wrapped with a wrapping paper is heated, but unlike conventional cigarettes, the tobacco rod remains unburned after use (after heating).

15 **[0003]** In conventional cigarettes, white (colorless) paper is generally used as a wrapping paper for wrapping shredded tobacco while a logo may be attached thereto in some cases.

[Summary of Invention]

[Technical Problem]

20 **[0004]** It was found that, when a wrapping paper used in conventional cigarettes is used as a wrapping paper for wrapping shredded tobacco in non-combustion-heating-type smoking products, heating thereof during use may cause discoloration that is unpleasant to a user.

25 **[0005]** Thus, an object of the present invention is to provide a wrapping paper for a non-combustion-heating-type smoking product that does not present an unpleasant visual appearance that may occur due to heating.

[Solution to Problem]

30 **[0006]** In order to achieve the above object, the inventors have focused on the fact that the unpleasant discoloration does not become noticeable when a wrapping paper that has a section having a certain color difference ΔE^* or more after heating compared to before heating is used.

35 **[0007]** Paper made mainly of pulp burns and turns brown when heated at a certain temperature or higher, but since the change in color is caused physically due to thermal decomposition of pulp and paper constituent components, it is not possible to simply prevent such discoloration. However, the inventors have found that, even if discoloration occurs due to burning, in order to prevent the discoloration from being recognized as an unpleasant color, by adding a specific heat sensitive material to the wrapping paper in advance so that a certain color difference or more occurs between before heating and after heating, the unpleasant discoloration can be made unapparent.

[0008] An object of the present invention is specific to a non-combustion-heating-type smoking product heated by an electric heating device and was not presented in conventional smoking products (cigarettes and the like).

40 **[0009]** Specifically, the present invention is as follows.

45 [1] A wrapping paper for a non-combustion-heating-type smoking product, the wrapping paper having a section in which a heat sensitive material is added to a surface that serves as an outer surface of the non-combustion-heating type smoking product, wherein in the wrapping paper a color difference ΔE^* between a color of the section in which the heat sensitive material is added before heating the wrapping paper and a color of the section in which the heat sensitive material is added after heating the wrapping paper at 200°C for 5 minutes is 15 or greater.

[2] The wrapping paper for a non-combustion-heating-type smoking product according to [1], wherein the heat sensitive material is one or more selected from the group consisting of organic acids or their salts, monosaccharides, disaccharides, polysaccharides and amino acids.

50 [3] The wrapping paper for a non-combustion-heating-type smoking product according to [2], wherein the organic acids or their salts are one or more selected from the group consisting of acetic acid, potassium acetate, sodium acetate, citric acid, potassium citrate, sodium citrate, tartaric acid, potassium tartrate, sodium tartrate, phosphoric acid, sodium phosphate, potassium phosphate, malic acid, sodium malate, magnesium malate, lactic acid, and calcium lactate.

55 [4] The wrapping paper for a non-combustion-heating-type smoking product according to [2], wherein the monosaccharides are one or more selected from the group consisting of fructose, galactose, and glucose, the disaccharides are one or more selected from the group consisting of maltose, lactose, and sucrose, the polysaccharides are one or more selected from the group consisting of carboxymethyl cellulose, carrageenan, pectin, and starch, and the

amino acids are one or more selected from the group consisting of valine, leucine, isoleucine, glutamine, alanine, asparagine and arginine.

[5] The wrapping paper for a non-combustion-heating-type smoking product according to any one of [1] to [4], wherein the heat sensitive material is colorless.

[6] The wrapping paper for a non-combustion-heating-type smoking product according to any one of [1] to [5], wherein, in the wrapping paper, a content of the heat sensitive material in the section in which the heat sensitive material is added is 0.007 mg/cm² or more.

[7] The wrapping paper for a non-combustion-heating-type smoking product according to any one of [1] to [6], wherein the section in which the heat sensitive material is added includes a section heated at 150°C to 250°C.

[8] The wrapping paper for a non-combustion-heating-type smoking product according to any one of [1] to [7], wherein a proportion of an area of the part in which the heat sensitive material is added relative to a total area of the wrapping paper is 1% to 50%.

[9] A non-combustion-heating-type smoking product comprising a filler containing shredded tobacco and an aerosol-source material and including a tobacco rod part wrapped with a first wrapping paper that wraps the filler, and a mouthpiece part constituting an end on an opposite side to the tobacco rod part, the tobacco rod part and the mouthpiece part being connected using a second wrapping paper which is the same as or different from the wrapping paper that wraps the filler, wherein at least one of the first wrapping paper and the second wrapping paper is the wrapping paper according to any one of [1] to [8].

[10] An electric-heating-type smoking system including an electric heating device which includes a heater member, a heat transfer member that transfers heat from the heater member, a battery unit serving as a power source of the heater member, and a control unit for controlling the heater member, and the non-combustion-heating type smoking product according to [9], which is fitted so as to come in contact with the heat transfer member.

[Advantageous Effects of Invention]

[0010] According to the present invention, it is possible to provide a wrapping paper for a non-combustion-heating-type smoking product that does not present an unpleasant visual appearance that may occur due to heating.

[Brief Description of Drawings]

[0011]

[Fig. 1]

Fig. 1 is a schematic view showing one mode of a non-combustion-heating-type smoking product.

[Fig. 2]

Fig. 2 is a schematic view showing one mode of an electric-heating-type smoking system.

[Description of Embodiments]

[0012] Hereinafter, the present invention will be described in detail with reference to embodiments, examples and the like, but the present invention is not limited to the following embodiments, examples, and the like, and can be arbitrarily changed and implemented without departing from the spirit and scope of the present invention.

<Wrapping paper for a non-combustion-heating-type smoking product>

[0013] In this specification, "a wrapping paper for a non-combustion-heating-type smoking product" is a wrapping paper used for a non-combustion-heating-type smoking product to be described below. Hereinafter, it will be simply referred to as a wrapping paper according to the embodiment of the present invention. Examples of applications of the wrapping paper according to the embodiment of the present invention "for a non-combustion-heating-type smoking product" include an application as a rod wrapping paper for producing a tobacco rod by wrapping a filler containing shredded tobacco, and an application as a tipping paper used for wrapping an outer surface in order to connect members (for example, a member constituting a mouthpiece part) adjacent to a tobacco rod.

[0014] The wrapping paper according to the embodiment of the present invention is a wrapping paper for a non-combustion-heating-type smoking product having a section in which a heat sensitive material is added to a surface which becomes the outer surface of the non-combustion-heating-type smoking product, and the wrapping paper has a color difference ΔE^* between a color of a section in which a heat sensitive material is added before heating and a color of a section in which a heat sensitive material is added after heating the wrapping paper at 200°C for 5 minutes is 15 or more. Having such a color difference between before and after heating makes unpleasant discoloration that may occur

when the non-combustion-heating-type smoking product is used in a usual way not noticeable.

[0015] In the wrapping paper according to the embodiment of the present invention, the heat sensitive material is added to the surface which becomes the outer surface of the non-combustion-heating-type smoking product. In other words, for example, when the wrapping paper according to the embodiment of the present invention is used as a rod wrapping paper, the heat sensitive material is added to the surface that is not in contact with a tobacco filler to be described below. In addition, when the wrapping paper according to the embodiment of the present invention is used as a tipping paper, the heat sensitive material is added to the surface that is not in contact with the member (for example, the member of the mouthpiece part) adjacent to the tobacco rod.

[0016] Here, the section in which the heat sensitive material is added can be provided on the entire surface of the wrapping paper according to the embodiment of the present invention or can be provided at least in a section which will be heated (by an electric heating device to be described below).

[0017] In addition, a proportion of an area of the section in which the heat sensitive material is added with respect to a total area of the wrapping paper can be 1% to 50%. When the section in which the heat sensitive material is added is, for example, a logo or a character, the proportion of the area of the section in which the heat sensitive material is added with respect to the total area of the wrapping paper can be about 1% to 10% or about 1% to 5%. In addition, in a mode in which, in the wrapping paper, the heat sensitive material is added to a large section of the section which will be heated, the heat sensitive material can be added to 40% to 50% of the area of the wrapping paper.

[0018] The heat sensitive material added to the wrapping paper according to the embodiment of the present invention can be one or more selected from the group consisting of an organic acid or its salt, monosaccharides, disaccharides, polysaccharides and amino acids. When a combination of a plurality of these is used, for example, a combination of an organic acid or its salt and one or more sugars selected from the group consisting of monosaccharides, disaccharides, and polysaccharides (including a combination of an organic acid or its salt and monosaccharides, a combination of an organic acid or its salt and disaccharides, and a combination of an organic acid or its salt and polysaccharides), a combination of monosaccharides and amino acids, and a combination of monosaccharides and polysaccharides can be used. A mode in which these heat sensitive materials are appropriately dissolved in, for example, water, to prepare a heat sensitive material aqueous solution, and the solution is added to a wrapping paper can be applied.

[0019] The concentration of the heat sensitive material in preparation of the aqueous solution is not particularly limited, and can be, for example, 0.1 to 50 weight%, and preferably 0.2 to 40 weight%.

[0020] Examples of the organic acid or its salt include one or more selected from the group consisting of acetic acid, potassium acetate, sodium acetate, citric acid, potassium citrate, sodium citrate, tartaric acid, potassium tartrate, sodium tartrate, phosphoric acid, sodium phosphate, potassium phosphate, malic acid, sodium malate, magnesium malate, lactic acid, and calcium lactate. It is thought that, a use of such an organic acid or its salt lowers the amount of heat required for an oxidation reaction of pulp of the base wrapping paper and thus color development occurs.

[0021] Preferably, the monosaccharides are one or more selected from the group consisting of fructose, galactose, and glucose. Preferably, the disaccharides are one or more selected from the group consisting of maltose, lactose, and sucrose.

[0022] Preferably, the polysaccharides are one or more selected from the group consisting of carboxymethyl cellulose, carrageenan, pectin, and starch.

[0023] When the above monosaccharides, disaccharides, or polysaccharides are used, color development due to a caramelization reaction is thought to occur.

[0024] Preferably, the amino acids are one or more selected from the group consisting of valine, leucine, isoleucine, glutamine, alanine, asparagine and arginine. It is thought that these amino acids react with a carbonyl group contained in the pulp of the base wrapping paper according to a Maillard reaction and thus color development occurs.

[0025] Here, the appearance of the heat sensitive material aqueous solution is transparent. In addition, when such a heat sensitive material was added to the base wrapping paper, the color of the wrapping paper did not change. That is, the above heat sensitive material has a transparent appearance before heating. Thereby, colors that do not appear on the base wrapping paper before the non-combustion-heating-type smoking product is used can be developed on the wrapping paper by heating during use, and discoloration of the base wrapping paper which is not caused by color development of the heat sensitive material can thus be made unapparent.

[0026] Regarding the content of the heat sensitive material in the wrapping paper according to the embodiment of the present invention, the content in the section in which the heat sensitive material is added can be 0.007 mg/cm² or more and is preferably 0.07 mg/cm² or more. On the other hand, regarding the upper limit value of the content of the heat sensitive material, the content in the section in which the heat sensitive material is added can be, for example, 7 mg/cm² or less, and can be 6 mg/cm² or less in another example, and 5 mg/cm² or less in still another example. Such a content range contributes to obtaining a ΔE^* value of 15 or more between before and after heating the section in which the heat sensitive material is added.

[0027] Here, in the wrapping paper according to the embodiment of the present invention, the ΔE^* value between before and after heating the section in which the heat sensitive material is added is measured at five points on the sample

paper to which the heat sensitive material is added and a simple average value thereof is used. A measurement target is any section of the paper to which the heat sensitive material is added, but when there are characters or patterns such as logos on the paper, a part in which there are no such characters or logos is set as a target. The ΔE^* value can be measured using a spectrophotometer.

[0028] Specifically, a spectrophotometer (product name SpectroEye, commercially available from X-Rite Inc.) is used. Measurement is performed such that one sample is placed on a paper having an ISO whiteness of 92% under conditions of a light source D65, no light source filter, and a viewing angle of 2° , and a spectrophotometer is pressed on the sample.

[0029] A method of adding the aqueous solution in which the heat sensitive material is dissolved to the base wrapping paper is not particularly limited, and examples thereof include coating and printing. The coating method is not particularly limited. If the heat sensitive material is added to the base wrapping paper by printing, the above properties can be easily added to the wrapping paper.

[0030] The printing method is not particularly limited, and examples thereof include gravure printing and offset printing.

[0031] A mode in which printing is performed on the entire surface of the base paper and a mode in which printing is performed on at least a section of the surface of the base paper that is heated by an electric heating device to be described below can be applied.

[0032] In the surface of the wrapping paper, at least the section that is heated (section that is heated by the electric heating device) preferably has a color difference ΔE^* of 15 or more between before and after heating. Since the section of the surface of the wrapping paper that is heated by an electric heating device to be described below has the above characteristics, it is possible to prevent deterioration of an impression regarding the appearance after heating.

[0033] The shape of the wrapping paper for a non-combustible smoking product can be square or rectangular. When used as a wrapping paper for wrapping shredded tobacco (for producing the tobacco rod), the length of one side can be about 19 to 70 mm, and the length of the other side can be 15 to 26.5 mm, and a preferable length of the other side is 24 mm.

[0034] When the wrapping paper is for connecting the tobacco rod and other members adjacent to the tobacco rod as a tipping paper is, the length of one side can be 20 to 60 mm, and the length of the other side can be 15 to 26.5 mm.

[0035] The basis weight of the base wrapping paper according to the embodiment of the present invention is, for example, generally 20 g/m^2 or more, preferably 35 g/m^2 or more, and more preferably 40 g/m^2 or more. On the other hand, the basis weight is generally 65 g/m^2 or less and preferably 50 g/m^2 or less.

[0036] The thickness of the wrapping paper according to the embodiment of the present invention is not particularly limited, and in consideration of rigidity, air permeability, and ease of adjustment during papermaking, it is generally $10 \text{ }\mu\text{m}$ or more, preferably $20 \text{ }\mu\text{m}$ or more, and more preferably $30 \text{ }\mu\text{m}$ or more, and generally $100 \text{ }\mu\text{m}$ or less, preferably $75 \text{ }\mu\text{m}$ or less, and more preferably $50 \text{ }\mu\text{m}$ or less.

[0037] Examples of the base wrapping paper according to the embodiment of the present invention include those containing pulp as a main component. In addition to the pulp which is made from wood pulp such as softwood pulp and hardwood pulp, those manufactured by mixing non-wood pulp that is generally used for a wrapping paper for smoking products such as flax pulp, cannabis pulp, sisal pulp, and esparto can be used.

[0038] Regarding the type of pulp, chemical pulp, ground pulp, chemiground pulp, thermomechanical pulp, and the like obtained by a Kraft pulping method, an acidic/neutral/alkaline sulfite pulping method, a soda salt pulping method, and the like can be used as pulp.

[0039] In addition, as the pulp, for example, a pulp mixture containing bleached pulp and unbleached pulp can be used.

[0040] When the pulp mixture is used, those from coniferous spruce and hardwood poplar can be prepared as bleached pulp and pine pulp can be prepared as unbleached pulp. The bleached pulp and the unbleached pulp with a desired ratio therebetween are put into a pulper and these pulps are disaggregated. Next, the disaggregated pulp is transferred to a refiner, and beaten in the refiner. Separately, calcium carbonate as a filler and a flocculation agent as a manufacturing agent are prepared, and these are mixed with the beaten pulp. Here, the bleached pulp and the unbleached pulp can be individually disaggregated using a plurality of pulpers and beaten in the refiner, and the individually beaten bleached pulp and unbleached pulp, the filler, and the manufacturing agent can be mixed in a mixing box.

[0041] Next, in the papermaking process using the mixed pulp performed by a Fourdrinier papermaking machine, a cylinder papermaking machine, a short circular composite papermaking machine, or the like, a wrapping paper is manufactured by adjusting and homogenizing texture. Here, as necessary, the above wet paper strength enhancing agent can be added to impart water resistance to the wrapping paper, and a size agent can be added to adjust wrapping paper printing conditions. In addition, papermaking internal additives such as a sulfate band, various anionic, cationic, nonionic or amphoteric yield improving agents, a freeness improving agent, and a paper strength enhancing agent, and also papermaking additives such as a pigment, a pH adjusting agent, an anti-foaming agent, a pitch control agent, and a slime control agent can be added.

[0042] When a mixture containing bleached pulp and unbleached pulp is used, the proportion of the unbleached pulp in the wrapping paper is, for example, preferably 1 weight% or more and 90 weight% or less, more preferably 5 weight% or more and less than 86 weight%, and still more preferably 5 weight% or more and 60 weight% or less.

[0043] The base wrapping paper according to the embodiment of the present invention can contain a filler in addition to the above pulp. The content of the filler can be 30 weight% or more and less than 60 weight% with respect to the total weight of the wrapping paper according to the embodiment of the present invention.

[0044] As the filler, calcium carbonate, titanium dioxide, kaolin or the like can be used, and calcium carbonate is preferably used in consideration of taste and the like.

[0045] Paper containing such a filler generally has a bright white color. On the other hand, a wrapping paper composed of a pulp mixture generally has a color derived from the unbleached pulp.

[0046] A sheet tobacco composed of a recycled tobacco can be used as the base wrapping paper according to the embodiment of the present invention.

[0047] Examples of sheet tobaccos include a papermaking sheet tobacco obtained by a papermaking method and a slurry sheet tobacco obtained by drying a slurry.

[0048] A general method of manufacturing a papermaking sheet tobacco can include a process in which an extraction operation is performed on natural tobacco materials (leaves, cuts, internodes, stems, roots, etc.) using an extraction solvent such as water, a process in which the extraction liquid obtained by the extraction operation and the residue are separated, a process in which the residue is used for papermaking and thus a recycled tobacco web is produced, and a process in which the fractionated extraction liquid is added back to the recycled web as necessary. Such a manufacturing method is described as a wet papermaking method in, for example, WO 2004/006001.

[0049] The slurry sheet tobacco can be produced by, for example, the method described in Japanese Patent Application Publication No. H 11 -266851. The raw material slurry contains wood pulp mixed and disentangled in water, a tobacco powder, and a binder. The raw material slurry is extruded from a slurry supply device between a belt conveyor and a roller, and stretched into a sheet form on the belt conveyor. Then, the sheet-like raw material slurry on the belt conveyor is transferred into a drying furnace and dried when passing through the drying furnace, and a sheet tobacco is formed.

[0050] When the sheet tobacco is used as the base wrapping paper according to the embodiment of the present invention, the basis weight can be in a range of 30 to 80 g/m², and the air permeability can be 0 to 60 CU (Coresta units).

[0051] As another method for manufacturing a sheet tobacco, for example, a dry papermaking method described in Japanese Patent Application Publication No. S61-52269, can be applied, and the sheet tobacco obtained by the above dry papermaking method includes a wood pulp fiber, an adhesive, and a tobacco stem.

[0052] The wrapping paper according to the embodiment of the present invention may or may not include a combustion improver contained in wrapping paper for conventional tobacco rod. The wrapping paper according to the embodiment of the present invention can be used as a first wrapping paper or a second wrapping paper used in a non-combustion-heating-type smoking product to be described below.

<Non-combustion-heating-type smoking product>

[0053] The non-combustion-heating-type smoking product according to the embodiment of the present invention can be exemplified by a product having the configuration shown in Fig. 1.

[0054] A non-combustion-heating-type smoking product 10 in Fig. 1 includes a filler 11, a tobacco rod part composed of a first wrapping paper 12 that wraps the filler 11, and a mouthpiece part 16 constituting an end opposite to the tobacco rod part, and the tobacco rod part and the mouthpiece part are connected using a second wrapping paper 13 (tipping paper in Fig. 1) which is the same as or different from the wrapping paper that wraps the filler.

[0055] At least one of the first wrapping paper and the second wrapping paper is the wrapping paper according to the embodiment of the present invention described above. At least the first wrapping paper is preferably the wrapping paper according to the embodiment of the present invention. In addition, both the first wrapping paper 12 and the second wrapping paper are preferably the wrapping paper according to the embodiment of the present invention described above.

[0056] In the mode shown in Fig. 1, the mouthpiece part 16 includes a paper tube part 14 and a filter part 15. In addition, a tipping paper 13 is provided as a second wrapping paper for connecting the parts. Here, in Fig. 1, the mouthpiece part 16 is composed of two segments, but the mouthpiece part 16 can be composed of a single segment or three or more segments. In addition, the segment constituting the mouthpiece part can include both the paper tube part and the filter part or can include only one of them.

[0057] When water vapor containing an aerosol-source material and a tobacco flavor component, which is generated by heating the tobacco rod, passes through the paper tube part 14, it comes in contact with air in the paper tube and is cooled and liquefied to generate an aerosol.

[0058] In addition, the non-combustion-heating-type smoking product 10 can have perforations for receiving air from the outside in the paper tube part 14 and a part of the second wrapping paper 13 (tipping paper) that wraps around the paper tube part 14 (not shown). When such perforations are provided, air flows into the paper tube part 14 from the outside during use, water vapor containing an aerosol-source material and a tobacco flavor component, which is generated by heating the tobacco rod, comes in contact with air from the outside and is liquefied as the temperature decreases, and an aerosol is more reliably generated.

[0059] The paper tube part 14 can be, for example, a part obtained by processing a cardboard into a cylindrical shape.

[0060] The filter part 15 can be, for example, a part using acetate tow as a material. The single yarn fineness and total fineness of the acetate tow are not particularly limited.

[0061] In Fig. 1, the filter part 15 is composed of a single segment, but can be composed of a plurality of segments. When the configuration includes a plurality of segments, for example, a mode in which a hollow segment is disposed on the upstream side and a mouthpiece cross section is filled with acetate tow as a downstream side (user's mouthpiece end side) segment can be applied. In such a mode, it is possible to prevent unnecessary loss of a generated aerosol and to improve the appearance of the non-combustion-heating-type smoking product.

[0062] In addition, in manufacture of a filter, adjustment of the ventilation resistance and addition of additives (a known adsorbent, a flavor, a flavor-holding material, and the like) can be appropriately designed.

[0063] The material of the second wrapping paper 13 (tipping paper) is not particularly limited, and the wrapping paper according to the embodiment of the present invention can be partially or entirely used. For example, the second wrapping paper 13 can be used for fixing the above-described tobacco rod, the paper tube part 14, and the filter part 15 after wrapping them with paste such as vinyl acetate.

[0064] The tobacco rod includes shredded tobacco as the filler 11, and the material of the shredded tobacco is not particularly limited, and known materials such as lamina and internodes can be used. In the case of a tobacco rod having a circumference of 22 mm and a length of 20 mm, the range of the content of the filler in the tobacco rod can be 200 to 400 mg/rod, and is preferably 250 to 320 mg/rod. The water content of the filler can be 10 to 15 weight%, and preferably 11 to 13 weight%. With such a water content, the occurrence of winding stains is minimized, and the machinability for manufacturing the tobacco rod is improved.

[0065] The size of shredded tobacco used as the filler and a preparation method thereof are not particularly limited. For example, pieces obtained by cutting dried tobacco leaves into a width of 0.8 to 1.2 mm can be used.

[0066] In addition, pieces obtained by crushing the dried tobacco leaves so that they have an average particle size of about 20 to 200 μm , homogenizing, then making a sheet, and cutting the sheet into a width of 0.8 to 1.2 mm can be used.

[0067] In addition, what the above sheet-processed pieces are gathered into without cutting can be used as a filler.

[0068] The filler includes an aerosol-source material that generates aerosol smoke. The type of the aerosol-source material is not particularly limited, and substances extracted from various natural products and/or their constituent components can be selected according to applications. Examples of aerosol-source materials can include glycerin, propylene glycol, triacetin, 1,3-butanediol, and mixtures thereof.

[0069] The content of the aerosol-source material in the filler is not particularly limited, and in order to generate sufficient aerosol and to impart good smoke taste, it is generally 5 weight% or more and preferably 10 weight% or more, and generally 50 weight% or less and preferably 20 weight% or less.

[0070] The filler can contain a flavor. The type of the flavor is not particularly limited, and in order to impart good smoke taste, acetanisole, acetophenone, acetylpyrazine, 2-acetylthiazole, alfalfa extract, amyl alcohol, amyl butyrate, trans-anethole, star anise oil, apple juice, Peruvian balsam oil, beeswax absolute, benzaldehyde, benzoin resinoid, benzyl alcohol, benzyl benzoate, benzyl phenylacetate, benzyl propionate, 2,3-butanedione, 2-butanol, butyl butyrate, butyric acid, caramel, cardamom oil, carob absolute, β -carotene, carrot juice, L-carvone, β -caryophyllene, cassia bark oil, cedarwood oil, celery seed oil, chamomile oil, cinnamaldehyde, cinnamic acid, cinnamyl alcohol, cinnamyl cinnamate, citronella oil, DL-citronellol, clary sage extract, cocoa, coffee, cognac oil, coriander oil, cuminaldehyde, davana oil, δ -decalactone, γ -decalactone, decanoic acid, dill herb oil, 3,4-dimethyl-1,2-cyclopentanedione, 4,5-dimethyl-3-hydroxy-2,5-dihydrofuran-2-one, 3,7-dimethyl-6-octenoic acid, 2,3-dimethylpyrazine, 2,5-dimethylpyrazine, 2,6-dimethylpyrazine, ethyl 2-methylbutyrate, ethyl acetate, ethyl butyrate, ethyl hexanoate, ethyl isovalerate, ethyl lactate, ethyl laurate, ethyl levulinate, ethyl maltol, ethyl octoate, ethyl oleate, ethyl palmitate, ethyl phenylacetate, ethyl propionate, ethyl stearate, ethyl valerate, ethyl vanillin, ethyl vanillin glucoside, 2-ethyl-3-(5 or 6)-dimethylpyrazine, 5-ethyl-3-hydroxy-4-methyl-2(5H)-furanone, 2-ethyl-3-methylpyrazine, eucalyptol, fenugreek absolute, genet absolute, gentian root infusion, geraniol, geranyl acetate, grape juice, guaiacol, guava extract, γ -heptalactone, γ -hexalactone, hexanoic acid, cis-3-hexene-1-ol, hexyl acetate, hexyl alcohol, hexyl phenylacetate, honey, 4-hydroxy-3-pentenoic acid lactone, 4-hydroxy-4-(3-hydroxy-1-butenyl)-3,5,5-trimethyl-2-cyclohexen-1-one, 4-(para-hydroxyphenyl)-2-butanone, sodium 4-hydroxyundecanoate, immortelle absolute, β -ionone, isoamyl acetate, isoamyl butyrate, isoamyl phenylacetate, isobutyl acetate, isobutyl phenylacetate, jasmine absolute, cola nut tincture, labdanum oil, lemon terpeneless oil, licorice extract, linalool, linalyl acetate, lovage root oil, maltol, maple syrup, menthol, menthone, L-menthyl acetate, paramethoxybenzaldehyde, methyl-2-pyrrolyl ketone, methyl anthranilate, methyl phenylacetate, methyl salicylate, 4'-methylacetophenone, methylcyclopentenolone, 3-methylvaleric acid, mimosa absolute, molasses, myristic acid, nerol, nerolidol, γ -nonalactone, nutmeg oil, δ -octalactone, octanal, octanoic acid, orange flower oil, orange oil, orris root oil, palmitic acid, ω -pentadecalactone, peppermint oil, petitgrain paraguay oil, phenethyl alcohol, phenethyl phenylacetate, phenylacetic acid, piperonal, plum extract, propenyl guaetol, propyl acetate, 3-propylideneephthalide, prune juice, pyruvic acid, raisin extract, rose oil, rum, sage oil, sandalwood oil, spearmint oil, styrax absolute, marigold oil, tea distillate, α -terpineol, terpinyl acetate, 5,6,7,8-tetrahydroquinoxaline, 1,5,5,9-tetramethyl-13-oxacyclo(8.3.0.0 (4.9))tridecane, 2,3,5,6-tetramethylpyrazine,

thyme oil, tomato extract, 2-tridecanone, triethyl citrate, 4-(2,6,6-trimethyl-1-cyclohexenyl)2-buten-4-one, 2,6,6-trimethyl-2-cyclohexene-1,4-dione, 4-(2,6,6-trimethyl-1,3-cyclohexadienyl)2-buten-4-one, 2,3,5-trimethylpyrazine, γ -undecalactone, γ -valerolactone, vanilla extract, vanillin, veratraldehyde, or violet leaf absolute can be used, and menthol is particularly preferable among them. In addition, these flavors can be used alone, or two or more thereof can be used in combination.

[0071] The content of the fragrance material in the filler is not particularly limited, but in light of imparting good smoke taste, the content can be generally 10,000 ppm or more, preferably 20,000 ppm or more, and more preferably 25,000 ppm or more and generally 50,000 ppm or less, preferably 40,000 ppm or less, and more preferably 33,000 ppm or less.

[0072] The filling density of the filler is not particularly limited, and in order to secure performance of the non-combustion-heating-type smoking product and to impart good smoke taste, it is generally 250 mg/cm³ or more and preferably 320 mg/cm³ or more, and generally 520 mg/cm³ or less and preferably 420 mg/cm³ or less.

[0073] In manufacture of the non-combustion-heating-type smoking product according to the embodiment of the present invention, the above-described wrapping paper according to the embodiment of the present invention can be used. Specifically, a filler containing shredded tobacco and an aerosol-source material is molded and the molded filler is then wrapped using the wrapping paper according to the embodiment of the present invention, and thus a tobacco rod can be obtained. In addition, by wrapping the tobacco rod and a member constituting the mouthpiece part with a tipping paper (or the wrapping paper according to the embodiment of the present invention), a non-combustion-heating-type smoking product can be obtained. Here, a known winding device can be used for wrapping.

[0074] In manufacturing the non-combustion-heating-type smoking product, if the wrapping paper according to the embodiment of the present invention is used as a wrapping paper of the tobacco rod and/or as a tipping paper, it is possible to provide a non-combustion-heating-type smoking product of which impression regarding appearance is not impaired after use (after heating).

<Electric-heating-type smoking system>

[0075] Fig. 2 shows one mode of an electric-heating-type smoking system. An electric-heating-type smoking system 30 is used by being fitted so that the non-combustion-heating-type smoking product 10 described above comes in contact with a heat transfer member 25 in contact with a heater 24 disposed in an electric heating device 20.

[0076] For example, the electric heating device 20 includes a battery unit 21 and a control unit 22 inside a resinous body 23.

[0077] As described above, the non-combustion-heating-type smoking product includes the filler 11, a tobacco rod part composed of the first wrapping paper 12 that wraps the filler 11, and the mouthpiece part 16 constituting an end opposite to the tobacco rod part, and the tobacco rod part and the mouthpiece part are connected using a second wrapping paper which is the same as or different from the wrapping paper that wraps the filler. When the non-combustion-heating-type smoking product is fitted to an electric heating device, the outer surface of the tobacco rod and a part of the outer surface of the second wrapping paper (the tipping paper 13) that connects the tobacco rod to the paper tube part 14 comes in contact with the heat transfer member 25 inside the electric heating device 20.

[0078] The heater 24 inside the electric heating device 20 generates heat under control by the control unit 22. The heat is transferred to the tobacco rod of the non-combustion-heating-type smoking product through the heat transfer member 25, and both the aerosol-source material and the flavor component contained in the filler 11 of the tobacco rod are volatilized.

[0079] The tobacco rod is heated to about 150°C to 250°C by heating using the heater 24.

[0080] When the above ΔE^* is measured, the heating temperature of the wrapping paper is set to 200°C and the time is set to 5 minutes, on the assumption that the electric-heating-type smoking system according to the embodiment of the present invention is used.

[0081] Water vapor containing an aerosol-source material and a flavor component generated by heating is aerosolized inside the paper tube part 14 according to the mechanism described above, passes through the filter part 15 of the non-combustible type smoking product 10, and reaches user's oral cavity.

[Examples]

[0082] While the present invention will be described in more detail with reference to examples, the present invention is not limited to the description of the following examples without departing from the scope and spirit of the invention.

<Preparation of paper sample>

[0083] A commercially available wrapping paper for a tobacco rod was cut to 5 cm × 5 cm pieces.

[0084] In addition, substances shown in the following Table 1 were selected as a heat sensitive material, and aqueous

EP 3 777 579 A1

solutions containing the substances with a concentration shown in Table 1 were prepared. The aqueous solutions were applied with a width of 3 cm using a brush to the above-described cut wrapping paper.

[0085] In addition, cut wrapping paper to which nothing was applied was used as a control. Here, a commercially available wrapping paper for a tobacco rod contains about 1.2 weight% of citric acid as a combustion improver with respect to the total amount of the wrapping paper (shown as a coating amount in Table 1, but no coating was performed).

[0086] In addition, a commercially available wrapping paper for a self-extinguishing tobacco rod (a self-extinguishing agent was applied to a surface in contact with shredded tobacco) was prepared as Comparative Example 1.

[0087] Samples were placed on household aluminum foil (material: aluminum foil thickness: 11 μm) and heated in a muffle furnace (product name: Muffle Furnace FO410 type, commercially available from Yamato Scientific Co., Ltd.) at 200°C for 5 minutes.

<Measurement of color difference>

[0088] ΔE^* of the samples between before and after heating was measured using a spectrophotometer (product name SpectroEye, commercially available from X-Rite). Measurement was performed such that one sample was placed on a paper having an ISO whiteness of 92% under conditions of a light source D65, no light source filter, and a viewing angle of 2°, and a spectrophotometer was pressed on the sample.

[0089] The measurement was repeated at five points on the section in which the heat sensitive material was applied and an average value was used for analysis.

[0090] The results of the color difference measurement are shown in Table 1.

[Table 1]

Sample No.	Heat sensitive material	Substance	Coating amount mg/cm ²	Concentration of aqueous solution	ΔE^* value
1	Organic acid	Acetic acid	0.007	0.3	20.1
2			0.07	3	21.4
3			0.7	30	21.5
4		Potassium citrate	0.07	3	20.9
5			0.7	30	28.7
6	Monosaccharides	Glucose	0.007	0.3	16.4
7			0.07	3	19.0
8			0.7	30	39.1
9	Disaccharides	Sucrose	0.007	0.3	21.5
10			0.07	3	20.9
11			0.7	30	32.4
12	Polysaccharides	CMC	0.07	3	15.5
13		Pectin	0.07	3	16.8
14	Control		0.016~0.031	-	12.3
15	Comparative Example 1		0.147	-	13.2

[0091] Based on the results in Table 1, samples obtained by applying the aqueous solutions containing substances shown in Table 1 as heat sensitive materials to the wrapping paper had color differences ΔE^* of 15 or more between before and after heating at 200°C for 5 minutes, but the color differences ΔE^* were less than 15 in the control and Comparative Example 1. In addition, while the samples having color differences ΔE^* of 15 or more discolored to an extent that the color differences ΔE^* between before and after heating became 15 or more, unpleasant color was not recognized even after heating in observation by panelists.

[0092] On the other hand, when panelists observed the control and Comparative Example 1 in which the color differences ΔE^* were less than 15, the appearance after heating showed a somewhat unpleasant impression compared to that before heating.

[Reference Signs List]

[0093]

- 5 10 Non-combustion-heating-type smoking product
- 11 Filler
- 12 First wrapping paper
- 13 Second wrapping paper (tipping paper)
- 14 Paper tube part
- 10 15 Filter part
- 16 Mouthpiece part
- 20 Electric heating device
- 21 Battery unit
- 22 Control unit
- 15 23 Body
- 24 Heater
- 25 Heat transfer member
- 30 Electric-heating-type smoking system

20

Claims

1. A wrapping paper for a non-combustion-heating-type smoking product, the wrapping paper having a section in which a heat sensitive material is added to a surface that serves as an outer surface of the non-combustion-heating-type smoking product,
 25 wherein in the wrapping paper a color difference ΔE^* between a color of the section in which the heat sensitive material is added before heating the wrapping paper and a color of the section in which the heat sensitive material is added after heating the wrapping paper at 200°C for 5 minutes is 15 or greater.
- 30 2. The wrapping paper for a non-combustion-heating-type smoking product according to claim 1, wherein the heat sensitive material is one or more selected from the group consisting of organic acids or salts thereof, monosaccharides, disaccharides, polysaccharides and amino acids.
- 35 3. The wrapping paper for a non-combustion-heating-type smoking product according to claim 2, wherein the organic acids or salts thereof are one or more selected from the group consisting of acetic acid, potassium acetate, sodium acetate, citric acid, potassium citrate, sodium citrate, tartaric acid, potassium tartrate, sodium tartrate, phosphoric acid, sodium phosphate, potassium phosphate, malic acid, sodium malate, magnesium malate, lactic acid, and calcium lactate.
- 40 4. The wrapping paper for a non-combustion-heating-type smoking product according to claim 2, wherein the monosaccharides are one or more selected from the group consisting of fructose, galactose, and glucose, the disaccharides are one or more selected from the group consisting of maltose, lactose, and sucrose, the polysaccharides are one or more selected from the group consisting of carboxymethyl cellulose, carrageenan, pectin, and starch, and the amino acids are one or more selected from the group consisting of valine, leucine,
 45 isoleucine, glutamine, alanine, asparagine and arginine.
5. The wrapping paper for a non-combustion-heating-type smoking product according to any one of claims 1 to 4, wherein the heat sensitive material is colorless.
- 50 6. The wrapping paper for a non-combustion-heating-type smoking product according to any one of claims 1 to 5, wherein, in the wrapping paper, a content of the heat sensitive material in the section in which the heat sensitive material is added is 0.007 mg/cm² or more.
7. The wrapping paper for a non-combustion-heating-type smoking product according to any one of claims 1 to 6,
 55 wherein the section in which the heat sensitive material is added includes a section that is heated at 150°C to 250°C.
8. The wrapping paper for a non-combustion-heating-type smoking product according to any one of claims 1 to 7, wherein a proportion of an area of the section in which the heat sensitive material is added relative to a total area

of the wrapping paper is 1% to 50%.

- 5 9. A non-combustion-heating-type smoking product comprising a filler containing shredded tobacco and an aerosol-source material and including a tobacco rod part wrapped with a first wrapping paper that wraps the filler, and a mouthpiece part constituting an end on an opposite side to the tobacco rod part, the tobacco rod part and the mouthpiece part being connected using a second wrapping paper which is the same as or different from the wrapping paper that wraps the filler, wherein at least one of the first wrapping paper and the second wrapping paper is the wrapping paper according to any one of claims 1 to 8.

- 10 10. An electric-heating-type smoking system, comprising:

an electric heating device including a heater member, a heat transfer member that transfers heat from the heater member, a battery unit serving as a power source of the heater member, and a control unit for controlling the heater member; and
15 the non-combustion-heating-type smoking product according to claim 9, which is fitted so as to come in contact with the heat transfer member.

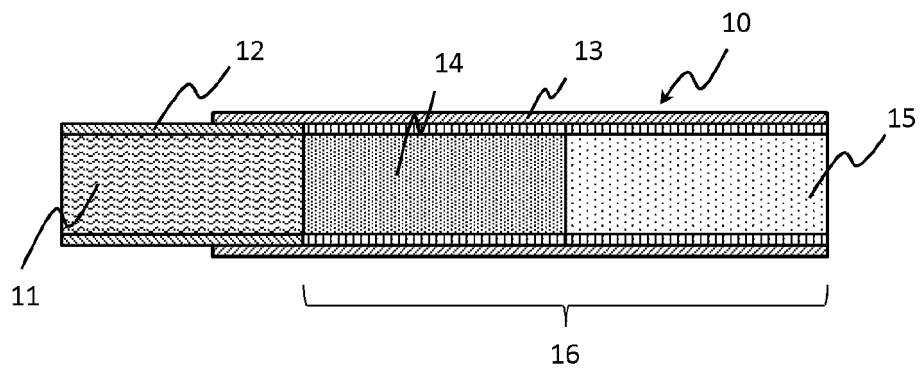


Fig.1

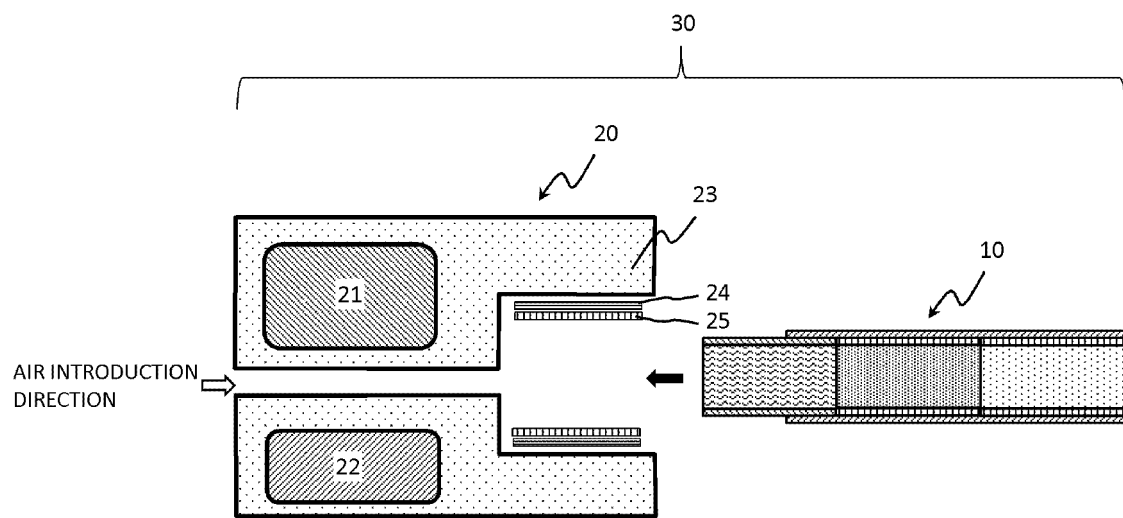


Fig.2

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2018/017407

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl. A24F47/00 (2006.01) i, A24D1/02 (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, A24D1/02

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 1971-2018

Registered utility model specifications of Japan 1996-2018

Published registered utility model applications of Japan 1994-2018

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	JP 2017-501676 A (PHILIP MORRIS PRODUCTS S.A.) 19 January 2017, paragraphs [0009], [0058], fig. 2, 6	1-10
Y	JP 2009-529872 A (R. J. REYNOLDS TOBACCO COMPANY) 27 August 2009, paragraph [0157]	1-10
Y	JP 10-268772 A (MITSUBISHI PAPER MILLS LTD.) 09 October 1998, paragraphs [0048], [0049], [0066]	2-10
Y	WO 2012/014970 A1 (NIPPON PAPER PAPYLIA CO., LTD.) 02 February 2012, paragraphs [0065], [0068], [0069], [0071]	2-10
Y	WO 2015/177907 A1 (JAPAN TOBACCO INC.) 26 November 2015, paragraph [0009]	5-10



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search
29.06.2018Date of mailing of the international search report
10.07.2018Name and mailing address of the ISA/
Japan Patent Office
3-4-3, Kasumigaseki, Chiyoda-ku,
Tokyo 100-8915, Japan

Authorized officer

Telephone No.

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

INTERNATIONAL SEARCH REPORT
 Information on patent family members

 International application No.
 PCT/JP2018/017407

Patent Documents referred to in the Report	Publication Date	Patent Family	Publication Date
JP 2017-501676 A	2017.01.19	US 2016/0295926 A1, paragraphs [0009], [0061], fig. 2, 6 WO 2015/082652 A1 EP 3076813 A1 AU 2014359187 A CA 2923377 A IL 244164 D CN 105722415 A KR 10-2016-0092988 A EA 201690668 A MX 2016007082 A HK 1223514 A ZA 201601101 B	
JP 2009-529872 A	2009.08.27	US 2007/0215168 A1, paragraph [0156] US 2016/0073687 A1 WO 2007/108878 A2 EP 1993388 A2 EP 2241203 A2 ES 2393371 T ES 2534746 T	
JP 10-268772 A	1998.10.09	Family: none	
WO 2012/014970 A1	2012.02.02	JP 2016-53235 A, paragraphs [0131], [0135], [0136] [0139] US 8877678 B2 US 2014/0338851 A1 EP 2599914 A1	
WO 2015/177907 A1	2015.11.26	Family: none	

Form PCT/ISA/210 (patent family annex) (January 2015)

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- WO 2004006001 A [0048]
- JP H11266851 B [0049]
- JP S6152269 B [0051]