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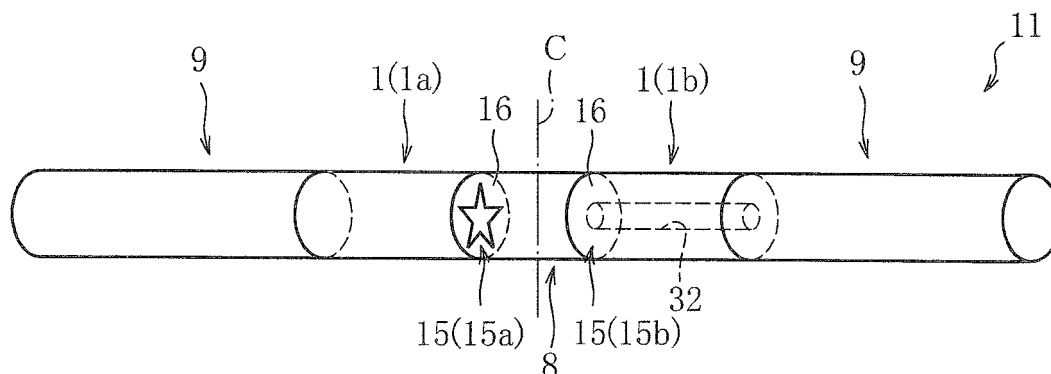
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(54) **CIGARETTE PRODUCTION METHOD, CIGARETTE, AND DOUBLE CIGARETTE**

(57) A double cigarette (11) includes mouth-end filter bodies (1a and 1b) to be located on respective mouth-end sides of finished cigarettes, the mouth-end filter bodies containing filter fibers and extending along an axial direction; a filter plug (8) in which the mouth-end filter bodies (1a and 1b) are placed in a line along the axial direction; cigarette rods (9) placed on opposite sides of the filter plug (8); and tipping paper adapted to integrally wrap the filter plug (8) and the cigarette rods (9), wherein

distinguishing indicators (15a and 15b) visually distinguishable from the filter fibers are formed on respective mouth-side end faces (16) which are opposing end faces of the mouth-end filter bodies (1a and 1b), the filter plug (8) is formed such that the mouth-end filter bodies (1a and 1b) whose distinguishing indicators (15a and 15b) differ from each other are placed with the distinguishing indicators (15a and 15b) facing each other.

FIG. 4



Description**Technical Field**

[0001] The present invention relates to a cigarette production method, a cigarette, and a double cigarette.

Background Art

[0002] A filter which is used for a cigarette and whose end face is patterned is known (see, for example, Patent Document 1). The pattern which appears on the end face is formed by extending along the length of the filter, and consequently, the same pattern appears on the end face of the filter no matter what part of the filter may be cut during production of the filter.

[0003] In the case of a hollow filter with a through-hole formed longitudinally, a cross-sectional shape of the through-hole appears on the end face. (See, for example, Patent Document 2). Other examples of distinguishing indicators, such as patterns and shapes, provided separately from filter material such as a filter tow and configured to be visually distinguishable and recognizable in this way include a colored thread provided along the length of the filter (see, for example, Patent Document 3) and a blind hole which extends from the end face of the filter and whose shape is used for distinction (see, for example, Patent Document 4).

[0004] On the other hand, a double cigarette is known (see, for example, Patent Document 5). The double cigarette is produced by arranging filters for two cigarettes in a line to form a filter plug, placing cigarette rods at opposite ends of the filter plug, and integrating the filter plug and cigarettes using tipping paper. Finally, the double cigarette is cut in the middle (between the two filters), producing two filter cigarette rods.

[0005] The distinguishing indicators described above are also applicable to double cigarettes. That is, filter tips with a distinguishing indicator provided on the end face are sent out, facing in the same direction and the filter tips are wrapped in inner plug wrapper, thereby forming a filter plug. Then, cigarette rods are placed at opposite ends of the filter plug, thereby integrating the filter plug and cigarette rods, and the filter plug is cut in the middle, thereby producing two cigarettes with the distinguishing indicator provided on their end faces.

Prior Art Document**Patent Document****[0006]**

Patent Document 1: International Publication No. WO 2011/148130

Patent Document 2: Japanese Patent Laid-Open No. 4-352862

Patent Document 3: International Publication No.

WO 2012/114437

Patent Document 4: British Patent Laid-Open No. 2347607

Patent Document 5: Japanese Patent Laid-Open No. 2003-24035

Summary of the Invention**Problems to be solved by the Invention**

[0007] However, when one wants to obtain cigarettes having different distinguishing indicators in a mixed state, it is necessary to produce and then mix cigarettes having respective distinguishing indicators. For example, when one wants to obtain two types of cigarette in a mixed state out of the cigarettes having the distinguishing indicators described in Patent Documents 1 to 4, it is necessary to produce the two types separately and then mix the two. When one has to mix two types of cigarette in equal numbers, it is necessary to further count the number of cigarettes of each type and equalize the number of cigarettes between the two types, resulting in low operation efficiency.

[0008] The present invention has been made in consideration of the conventional techniques described above and has an object to provide a cigarette production method, cigarette, and double cigarette which allow two groups of cigarettes having respective types of distinguishing indicators to be obtained in equal numbers in the same production process.

Means for Solving the Problems

[0009] To achieve the above object, the present invention provides a cigarette production method comprising: a send-out step of arranging and sending out a plurality of filter tips each containing filter fibers and extending in an axial direction; a filter plug forming step of forming a filter rod by butting the plurality of filter tips in the axial direction and cutting the filter rod into filters for two cigarettes with the filters being placed facing each other; and an exposure step of placing cigarette rods at opposite ends of the filter plug and wrapping the filter plug and the cigarette rods in tipping paper to form a double cigarette and cutting the filter plug and thereby exposing end faces of the filter tips, wherein a distinguishing-indicator forming step is carried out before the send-out step to form distinguishing indicators on mouth-side end faces of mouth-end filter bodies which are the filter tips exposed in the exposure step, the distinguishing indicators being visually distinguishable from the filter fibers, and in the send-out step, the mouth-end filter bodies whose distinguishing indicators differ from each other are placed such that the distinguishing indicators face each other.

[0010] Also, the present invention provides a cigarette comprising: the mouth-end filter body; and the cigarette rod.

[0011] Also, the present invention provides a double

cigarette comprising: mouth-end filter bodies to be located on respective mouth-end sides of finished cigarettes, the mouth-end filter bodies containing filter fibers and extending along an axial direction; a filter plug in which the mouth-end filter bodies are placed in a line along the axial direction; cigarette rods placed on opposite sides of the filter plug; and tipping paper adapted to integrally wrap the filter plug and the cigarette rods, wherein distinguishing indicators visually distinguishable from the filter fibers are formed on respective mouth-side end faces which are opposing end faces of the mouth-end filter bodies, and the filter plug is formed such that the mouth-end filter bodies whose distinguishing indicators differ from each other are placed with the distinguishing indicators facing each other.

Advantageous Effects of the Invention

[0012] According to the present invention, two groups of cigarettes having respective types of distinguishing indicators can be obtained in equal numbers in the same production process.

Brief Description of the Drawings

[0013]

FIG. 1 is a schematic sectional view describing a cigarette production method according to the present invention in sequence.

FIG. 2 is a schematic sectional view describing the cigarette production method according to the present invention in sequence.

FIG. 3 is a schematic sectional view describing the cigarette production method according to the present invention in sequence.

FIG. 4 is a schematic perspective view describing the cigarette production method according to the present invention in sequence.

FIG. 5 is a schematic perspective view describing the cigarette production method according to the present invention in sequence.

FIG. 6 is a schematic diagram showing an example of a mouth-end filter body.

FIG. 7 is a schematic diagram showing an example of a mouth-end filter body.

FIG. 8 is a schematic diagram showing an example of a mouth-end filter body.

FIG. 9 is a schematic diagram showing an example of a filter plug.

FIG. 10 is a schematic diagram showing an example of a filter plug.

FIG. 11 is a schematic diagram of a filter rod making machine.

Mode for Carrying out the Invention

[0014] First, a cigarette production method according

to the present invention will be described. As shown in FIG. 1, in production of cigarettes, a send-out step is carried out. In this step, plural filter tips 1 and 2 formed by wrapping filter fibers 4 in inner plug wrapper 3 and arranged in a line are sent out in the direction of arrow A (axial direction). In the example of FIG. 1, two filter tips 1 are arranged one after the other and sent out with a filter tip 2 being placed therebetween, where the filter tip 1 is a plain filter while the filter tip 2 is a charcoal filter in which activated carbon particles are distributed in filter fibers 4. The filter fibers 4 used are, for example, an acetate or other fiber bundle or a cellulose fiber sheet, to which a hardening agent (triacetin in the case of acetate fibers) has been added as required. The inner plug wrapper 3 is made of highly air-permeable paper having, for example, an air permeability of 10000 cu, basis weigh of 24.0 g/m², and width of 26.0 mm. Note that although the present embodiment shows an example in which inner plug wrapper is used as the filter tip 1, a so-called non-wrap filter in which an outer circumferential surface of filter fibers is hardened by heating may be used as the filter tip 1.

[0015] Next, a filter plug forming step is carried out as shown in FIG. 2. In this step, distances among the delivered plural filter tips 1 and 2 are narrowed and the filter tips are integrated by being wrapped in outer plug wrapper 5, thereby forming a filter rod 6. In the example of FIG. 2, a distance 7 is provided between the filter tips 1 facing each other. Subsequently, the filter rod 6 is cut at a position (approximate center of the filter tip 2) indicated by the cutting plane line B. This results in formation of a filter plug 8 (see FIG. 3) in which filters for two cigarettes are placed facing each other.

[0016] Next, an exposure step is carried out as shown in FIGS. 3 to 5. First, as shown in FIG. 3, cigarette rods 9 are placed at opposite ends of the filter plug 8 and these are wrapped in tipping paper 10 to form a double cigarette 11. The cigarette rod 9 is formed by wrapping cut tobacco 12 in cigarette paper 13, where the cut tobacco 12 is produced by shredding tobacco leaves. This is shown as a simplified perspective view in FIG. 4. As shown in FIG. 4, after a double cigarette 11 is formed, the filter plug 8 is cut in the middle (between filter tip 1 and filter tip 1) along the cutting plane line C. Consequently, two cigarettes 14 are produced as shown in FIG. 5. Since the double cigarette 11 (filter plug 8) has been cut along the cutting plane line C, end faces of the filter tips 1 are exposed on the cigarettes 14. Note that the cigarettes 14 (recessed filter cigarettes) shown in the example of FIG. 5 are shaped such that when the cut is made along the cutting plane line C, the tipping paper 10 protrudes further from the end faces of the filter tips 1 toward the front side (mouth-end side). For that, in the filter plug forming step, the distance 7 is provided between the filter tips 1 facing each other. In producing such recessed filter cigarettes, preferably highly-stiff paper having, for example, a basis weight of 100.0 g/m² and width of 26.5 mm is used as the outer plug wrapper 5.

[0017] Here, according to the present invention, a distinguishing-indicator forming step is carried out before the send-out step described above. The distinguishing-indicator forming step involves forming a distinguishing indicator 15 visually distinguishable from the filter fibers 4 on each of the end faces of the filter tips 1 exposed in the exposure step. Since the filter tip 1 on which the distinguishing indicator 15 has been formed is placed on the mouth-end side of the finished cigarette 14, the filter tip 1 is also referred to as a mouth-end filter body. Hereinafter, the filter tip 1 will be referred to as a mouth-end filter body 1. The distinguishing indicator 15 is formed on a mouth-side end face 16 of the mouth-end filter body 1 at least when the cigarette 14 is formed. Different distinguishing indicators 15 are formed, respectively, on mouth-end filter bodies 1a and 1b placed facing each other. FIG. 4 shows an example in which a distinguishing indicator 15a of the mouth-end filter body 1a is a pattern created by coloring the mouth-side end face 16 of the mouth-end filter body 1a, and specifically a star-shaped pattern is used as the distinguishing indicator 15. Also, a distinguishing indicator 15b of the mouth-end filter body 1b is expressed by an end face geometry of a through-hole 32 penetrating the mouth-end filter body 1b in an axial direction. Namely, this is when the mouth-end filter body 1b is formed by a hollow filter.

[0018] The mouth-end filter bodies 1 with the respective different distinguishing indicators 15 (15a and 15b) formed thereon in this way are arranged such that the distinguishing indicator 15a and distinguishing indicator 15b face each other in the send-out step described above. With this arrangement, the different distinguishing indicators 15a and 15b remain facing each other even on the resulting double cigarette such as shown in FIG. 4, and when the double cigarette is cut along the cutting plane line C, it is possible to obtain a pair of cigarettes 14a and 14b whose distinguishing indicators 15a and 15b different from each other are exposed. That is, two groups of cigarettes 14a and 14b having respective types of distinguishing indicators 15a and 15b can be obtained in equal numbers in the same production process. Thus, in creating a state in which two types of cigarette 14 are mixed in equal numbers, it is no longer necessary to produce cigarettes 14 individually and then count the number of cigarettes of each type and equalize the number of cigarettes between the two types. This results in improved operating efficiency.

[0019] This effect can always be achieved if the mouth-end filter bodies 1a and 1b arranged facing each other in the send-out step described above have the respective distinguishing indicators 15a and 15b different from each other. Thus, the distinguishing indicators 15 presented on the mouth-end filter bodies 1 may be of any type. For example, as shown in FIG. 6, the mouth-end filter body 1 may present the character F expressed by a cross-sectional shape of a through-hole 17 penetrating the mouth-end filter body 1 in a longitudinal direction. In so doing, if the adjacent filter tip 2 is colored, since the color

of the filter tip 2 can be recognized through the through-hole 17, the color can be made to be visually recognized as a background color of the distinguishing indicator 15. To color the filter tip 2, specifically, an acetate tow colored in advance can be used. As another example, the distinguishing indicator 15 may be expressed by a thread-like body 18 embedded along the length of the mouth-end filter body 1 as shown in FIG. 7. A plurality of the thread-like body 18 may be embedded, presenting a pattern or character on the end face of the mouth-end filter body 1. In this way, the distinguishing indicator 15 can also be formed by exposing plural cross sections of the thread-like bodies 18 on the mouth-side end face 16. As still another example, the distinguishing indicator 15 may be expressed by a cross-sectional shape of a blind hole 19 made in the end face of the mouth-end filter body 1 as shown in FIG. 8. As in the case of FIG. 6, FIG. 8 shows a case in which the character F is presented as a cross-sectional shape of the blind hole 19.

[0020] When an element which represents the distinguishing indicator 15 extends inward from the mouth-side end face 16 as shown in FIG. 6 to FIG. 8, a distance 7 by which the tipping paper 10 is to protrude from the mouth-side end face 16 as with the recessed filter cigarette does not need to be provided. That is, even if the mouth-end filter bodies 1 are in face-to-face contact with each other as shown in FIG. 9, if cuts are made along the cutting plane lines D at two locations on opposite sides of a boundary between the mouth-end filter bodies 1 facing each other, it is possible to obtain cigarettes 14 on each of which the tipping paper 10 is flush with the mouth-side end face 16 of the mouth-end filter body 1. Alternatively, if a hollow filter 20 of a hollow cylindrical shape is placed further on the mouth-end sides of the mouth-end filter bodies 1, when the hollow filter 20 is cut along the cutting plane line E, it is possible to obtain cigarettes 14 on each of which the distinguishing indicator 15 can be visually recognized through a hollow portion of the hollow filter 20.

[0021] The send-out step and filter plug forming step described above are carried out using a filter rod making machine 21 such as shown in FIG. 11. A case in which the filter rod 6 such as shown in FIG. 2 is produced will be described below. The making machine 21 is equipped with a suction conveyor 22, and supply units 23 to 25 adapted to supply the suction conveyor 22 with the mouth-end filter bodies 1 and filter tips 2 are installed in the vicinities of the suction conveyor 22. Each of the supply units 23 to 25 are equipped with a hopper 26, which is filled with the mouth-end filter bodies 1 or filter tips 2. Specifically, the hopper 26 of the supply unit 23 is filled with mouth-end filter bodies 1b, the hopper 26 of the supply unit 24 is filled with mouth-end filter bodies 1a, and the hopper 26 of the supply unit 25 is filled with filter tips 2. Each hopper 26 is equipped with circular knives 27 and the mouth-end filter bodies 1 and filter tips 2 in the hoppers 26 are cut to predetermined lengths. Specifically, when supplied to the hopper 26, each mouth-end filter

body 1 is 60 mm in total length, but cut to 10 mm by the circular knives 27. Also, each filter tip 2 is 112 mm in total length, and cut to 28 mm. Note that the circumferential length of both mouth-end filter body 1 and filter tip 2 is 24.0 mm. Looking now at the supply unit 23, the mouth-end filter bodies 1b cut to the predetermined length advance just as they are along a conveying route 28, and intervals at which the mouth-end filter bodies 1 are supplied to the suction conveyor 22 are adjusted by a delivery wheel 30 equipped with separation claws 29. Specifically, the delivery wheel 30 rotates in the direction of arrow G, and adjusts the timing for the separation claws 29 to supply the mouth-end filter bodies 1 to the suction conveyor 22. The mechanism for supply to the suction conveyor 22 is similar between the supply units 24 and 25.

[0022] When supplied to the suction conveyor 22, the mouth-end filter bodies 1b from the supply unit 23 are supplied in such a way that the mouth-side end faces 16 are located on the front side in the traveling direction. That is, the mouth-end filter bodies 1 are supplied in such a way that the distinguishing indicator 15b is located on the front side in the traveling direction. On the other hand, the mouth-end filter bodies 1a from the supply unit 24 are supplied to the suction conveyor 22 in such a way that the mouth-side end faces 16 are located on the rear side in the traveling direction. That is, the mouth-end filter bodies 1 are supplied in such a way that the distinguishing indicator 15a is located on the rear side in the traveling direction. The filter tips 2 from the supply unit 25 are supplied between the mouth-end filter bodies 1a and 1b whose mouth-side end faces 16 face away from each other. The mouth-end filter bodies 1 and filter tips 2 are conveyed as they are by the suction conveyor 22 and sent out while a spacer drum 31 places them in close contact with each other as appropriate and adjusts the distances 7 between them. Then, the mouth-end filter bodies 1 and filter tips 2 are wrapped in outer plug wrapper 5, thereby forming the filter rods 6. Note that to place a hollow filter 20 such as shown in FIG. 10 between the mouth-end filter bodies 1, a supply unit for use to supply hollow filters 20 to the suction conveyor 22 can be installed separately.

[0023] Possible methods for supplying the mouth-end filter bodies 1 to the suction conveyor 22 with their mouth-side end faces 16 facing each other in this way include a method which involves supplying the mouth-end filter bodies 1 to the hoppers 26 with their mouth-side end faces 16 turned in opposite directions, a method which involves supplying the mouth-end filter bodies 1 to the hoppers 26 with the mouth-side end faces 16 turned in the same direction and reversing one of the hoppers 26 subsequently, and a method which involves reversing the mouth-end filter bodies 1 from one of the supply units, e.g., the supply unit 24, one by one when supplying the mouth-end filter bodies 1 from the hoppers 26 to the suction conveyor 22.

[0024] The filter rod 6 formed in this way is cut in a midsection of the filter tip 2 to become the filter plug 8.

Then, the cigarette rods 9 are placed on opposite sides of the filter plug 8 and the cigarette rods 9 and filter plug 8 are wrapped in the tipping paper 10 to form a double cigarette as shown in FIGS. 3 and 4. That is, the double cigarette 11 according to the present invention includes the mouth-end filter bodies 1 located on the mouth-end side at least when the double cigarette 11 is turned into cigarettes 14 (see FIG. 5). Also, the double cigarette 11 includes the filter plug 8 made up of the mouth-end filter bodies 1 facing each other. Also, the double cigarette 11 includes the cigarette rods 9 placed on opposite sides of the filter plug 8. Also, the double cigarette 11 includes tipping paper 10 used to integrally wrap the filter plug 8 and the cigarette rods 9. Being located on the mouth-end side of the finished cigarettes 14, the opposing end faces of the mouth-end filter bodies 1 become the mouth-side end faces 16, and the distinguishing indicator 15 has been formed on each of the mouth-side end faces 16. The distinguishing indicator 15 is visually distinguishable from the filter fibers 4 forming the mouth-end filter bodies 1. The filter plug 8 keeps the respective distinguishing indicators 15a and 15b of the mouth-end filter bodies 1a and 1b facing each other, the distinguishing indicators 15a and 15b being different from each other.

Explanation of Reference Signs

[0025]

30	1	Filter tip (mouth-end filter body)
	2	Filter tip
	3	Inner plug wrapper
	4	Filter fibers
	5	Outer plug wrapper
35	6	Filter rod
	7	Distance
	8	Filter plug
	9	Cigarette rod
	10	Tipping paper
40	11	Double cigarette
	12	Cut tobacco
	13	Cigarette paper
	14	Cigarette
	15	Distinguishing indicator
45	16	Mouth-side end face
	17	Through-hole
	18	Thread-like body
	19	Blind hole
20	20	Hollow filter
50	21	Filter rod making machine
	22	Suction conveyor
	23	Supply unit
	24	Supply unit
	25	Supply unit
55	26	Hopper
	27	Circular knife
	28	Conveying route
	29	Separation claw

- 30 Delivery wheel
- 31 Spacer drum
- 32 Through-hole

fer from each other are placed with the distinguishing indicators facing each other.

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Claims

1. A cigarette production method comprising:

a send-out step of arranging and sending out a plurality of filter tips each containing filter fibers and extending in an axial direction; 10
 a filter plug forming step of forming a filter rod by butting the plurality of filter tips in the axial direction and cutting the filter rod into filters for two cigarettes with the filters being placed facing each other; and 15
 an exposure step of placing cigarette rods at opposite ends of the filter plug and wrapping the filter plug and the cigarette rods in tipping paper to form a double cigarette and cutting the filter plug and thereby exposing end faces of the filter tips, 20
 wherein a distinguishing-indicator forming step is carried out before the send-out step to form distinguishing-indicators on mouth-side end faces of mouth-end filter bodies which are the filter tips exposed in the exposure step, the distinguishing indicators being visually distinguishable from the filter fibers, and 25
 in the send-out step, the mouth-end filter bodies whose distinguishing indicators differ from each other are placed such that the distinguishing indicators face each other. 30

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2. A cigarette produced by the cigarette production method according to claim 1, comprising:

the mouth-end filter body; and the cigarette rod.

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3. A double cigarette comprising:

mouth-end filter bodies to be located on respective mouth-end sides of finished cigarettes, the mouth-end filter bodies containing filter fibers and extending along an axial direction; 45
 a filter plug in which the mouth-end filter bodies are placed in a line along the axial direction; cigarette rods placed on opposite sides of the filter plug; and 50
 tipping paper adapted to integrally wrap the filter plug and the cigarette rods, wherein distinguishing indicators visually distinguishable from the filter fibers are formed on respective mouth-side end faces which are opposing end faces of the mouth-end filter bodies, and the filter plug is formed such that the mouth-end filter bodies whose distinguishing indicators dif- 55

FIG. 1

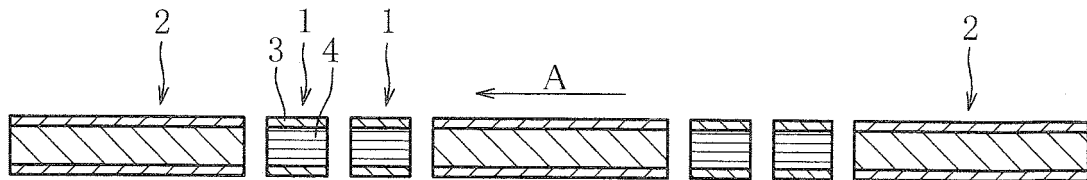


FIG. 2

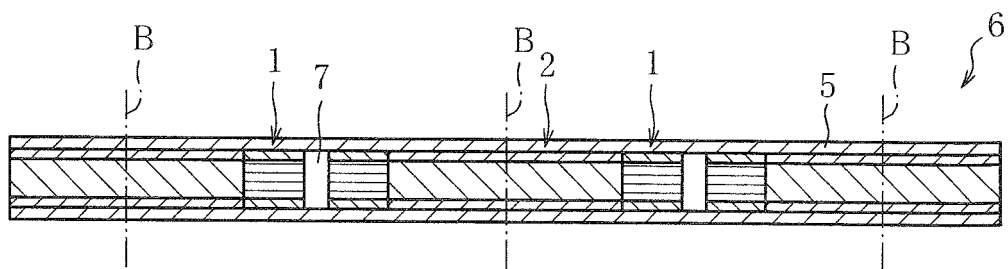


FIG. 3

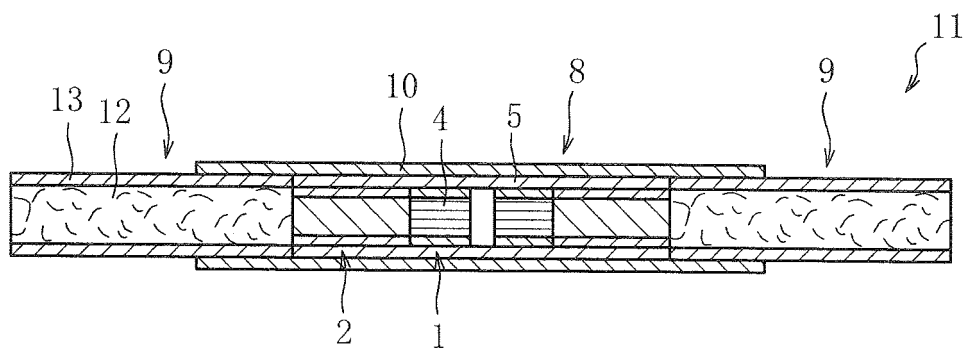


FIG. 4

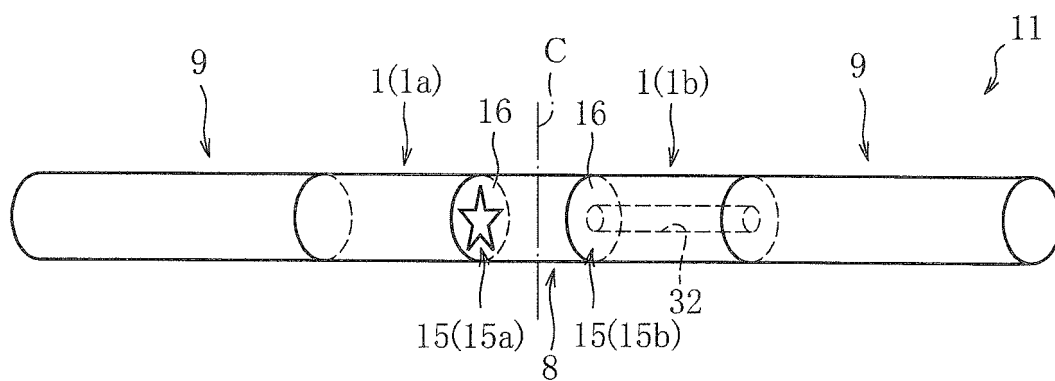


FIG. 5

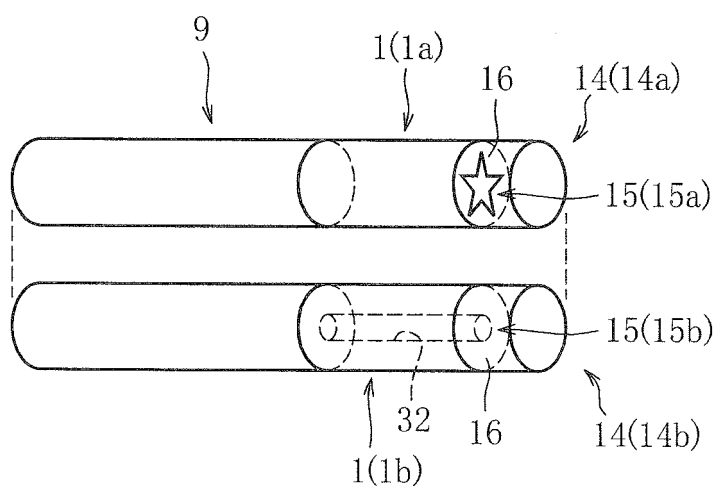


FIG. 6

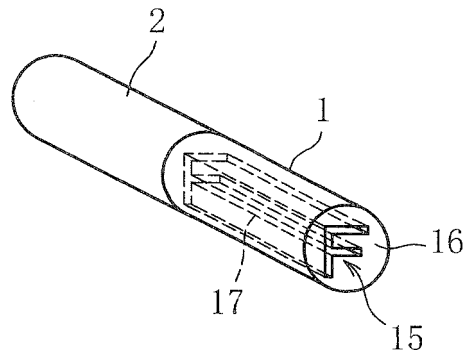


FIG. 7

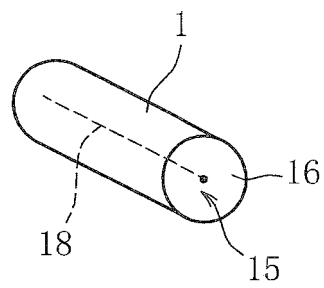


FIG. 8

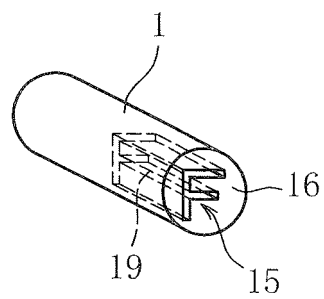


FIG. 9

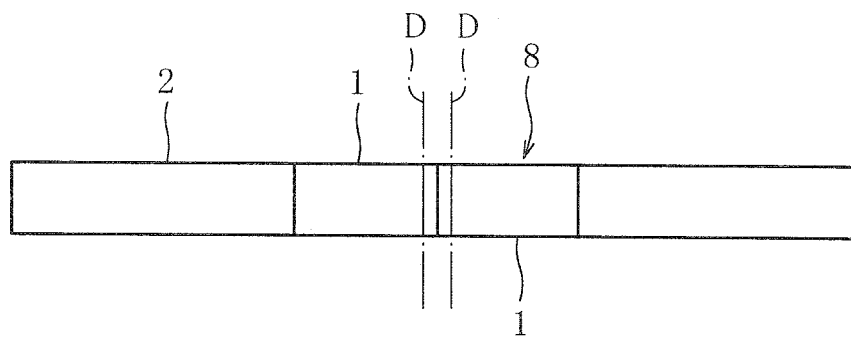
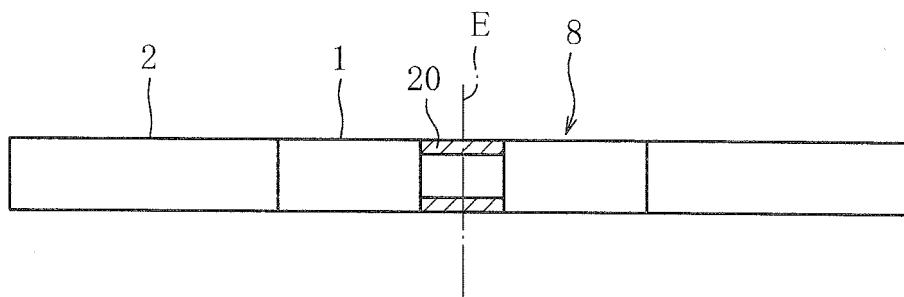
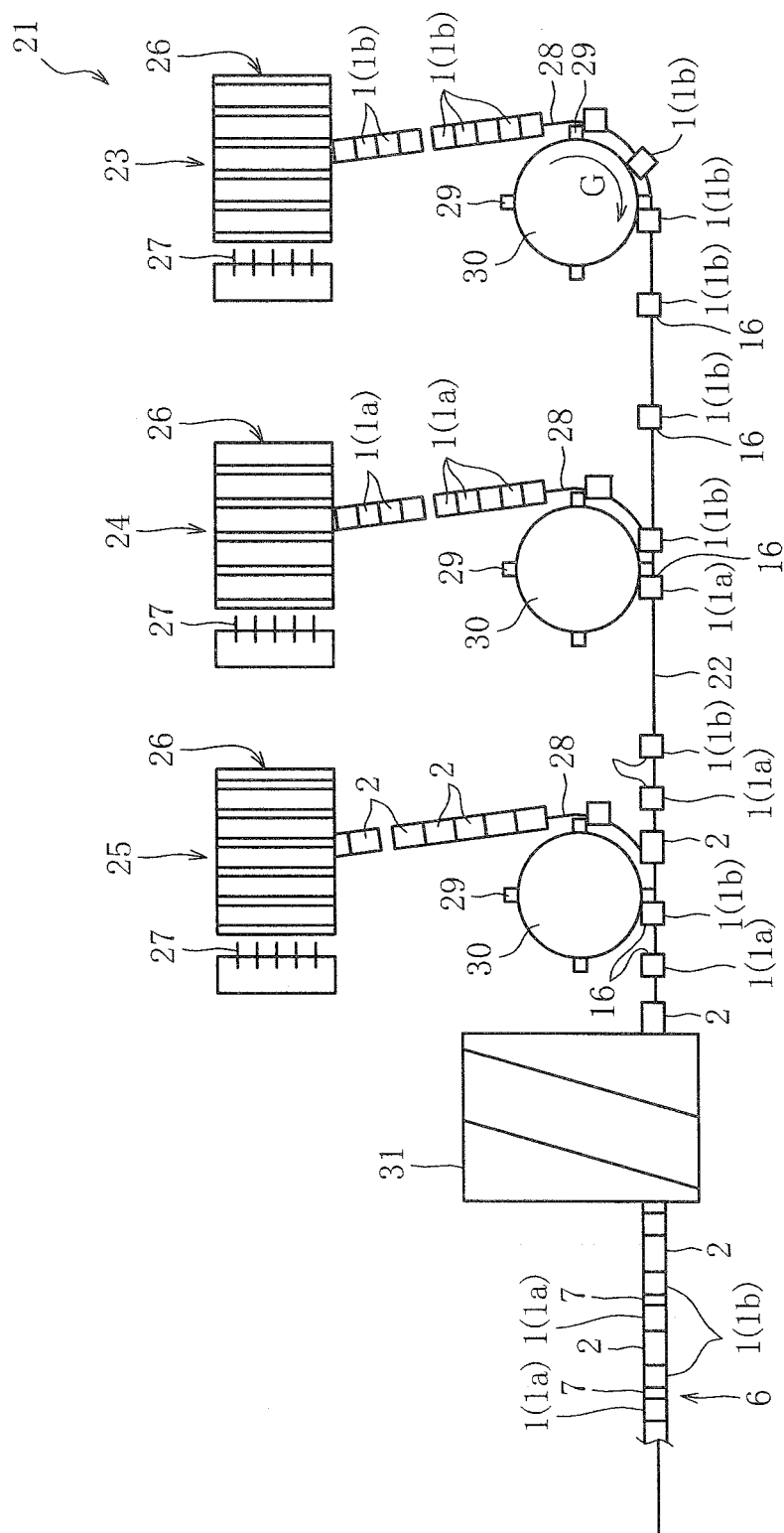


FIG. 10



IIIGII



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2013/056156

A. CLASSIFICATION OF SUBJECT MATTER

A24D3/02 (2006.01) i, A24C5/52 (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)

A24D3/02, A24D3/04, A24C5/52

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

Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2013

Kokai Jitsuyo Shinan Koho 1971-2013 Toroku Jitsuyo Shinan Koho 1994-2013

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2011/148130 A1 (FILTRONA INTERNATIONAL LTD.), 01 December 2011 (01.12.2011), entire text; all drawings & GB 201008922 D & GB 201008922 D0 & TW 201200043 A	1-3
A	JP 04-352862 A (Japan Filter Technology, Ltd.), 07 December 1992 (07.12.1992), entire text; all drawings (Family: none)	1-3
A	WO 2012/114437 A1 (Japan Tobacco Inc.), 30 August 2012 (30.08.2012), entire text; all drawings (Family: none)	1-3

☒ 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
04 June, 2013 (04.06.13)Date of mailing of the international search report
11 June, 2013 (11.06.13)Name and mailing address of the ISA/
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Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2013/056156

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	JP 2003-024035 A (Japan Tobacco Inc.), 28 January 2003 (28.01.2003), entire text; all drawings (Family: none)	1-3

Form PCT/ISA/210 (continuation of second sheet) (July 2009)

REFERENCES CITED IN THE DESCRIPTION

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