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(54) **FILTER ROD HAVING HOLLOW OUTER SECTION AND FILLED INNER CORE, AND PROCESSING METHOD THEREFOR**

FILTERSTAB MIT HOHLEM AUSSENTEIL UND GEFÜLLTEM INNENKERN UND
VERARBEITUNGSVERFAHREN DAFÜR

BÂTONNET-FILTRE AYANT UNE SECTION EXTERNE CREUSE ET UN NOYAU INTERNE REMPLI,
ET SON PROCÉDÉ DE TRAITEMENT

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Description**TECHNICAL FIELD**

5 [0001] The present invention belongs to the technical field of tobacco and provides a forming method of an externally-hollow filter stick with a filled core.

BACKGROUND

10 [0002] With intensifying competition of the tobacco industry market, a tobacco material with a single function hardly meets demands of cigarette brand development and product characteristics. With application of a new technology, a new process and a new material in a tobacco product, the tobacco material has been developed from the single function to multiple functions and diversified directions. With increasingly intense competition of the cigarette market, a cigarette product with a novel appearance and special functions is of interest to consumers, a filter stick serves as an important
15 composition part of a cigarette, and more and more hollow filter sticks are applied to the cigarette due to their special functions.

[0003] Cigarette flavoring plays a role in improving a physicochemical property of the cigarette, so the consumers have specific taste, smell and touch feeling and acceptability of the cigarette is improved. There are many types of flavoring methods, such as directly adding into cut tobacco or adding into other accessories of the cigarette, such as a
20 filter tip, cigarette paper and a packaging material. A microcapsule in a tobacco product is put at a joint between the filter tip and a cigarette, or may also be gathered in a middle section of the filter tip to form the filter tip, and plays a different role during smoking, and a flavoring substance maintains an original flavor and meanwhile can effectively highlight a flavor of the cigarette product, cover unfavorable smell and improve a smoking sensation.

[0004] Hollow filter sticks disclosed by patents CN210076559U, CN210382609U and CN105342005A each have a plurality of layers, and each layer is filled with tows. The hollow filter sticks in the above patents each need a pressure-reduced channel or groove formed by folding forming paper, these pressure-reduced channels or grooves are complicated
25 in shape and difficult for large-scale industrial production.

[0005] The prior art document WO 2019/110715 A1 describes a conventional tobacco smoke filter and corresponding manufacturing method.

30 [0006] The present invention, as defined in claim 1, is provided for solving the above problems.

SUMMARY

[0007] The present invention discloses in claim 1 a forming method of an externally-hollow filter stick with a filled core.

35 [0008] A technical solution in accordance with the present invention is as follows.

[0009] A first aspect is represented by an externally-hollow filter stick with a filled core. The externally-hollow filter stick with the filled core is cylindrical in appearance and is composed of an outer layer which is a cylinder W1 formed by rolling outer forming paper W and an inner layer which is in a cylindrical shape with a cross section being a regular triangle N1 in an axial direction of the cylinder W1 formed by folding inner forming paper N; and three vertexes of the regular triangle N1 are on an inner wall surface of the cylinder W1, wherein an interior of the inner forming paper N is filled with inner tows S2.
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[0010] The quantity of the inner forming paper N is 30-40 g/m².

[0011] The quantity of the outer forming paper W is 90-110 g/m².

[0012] The regular triangle N1 is formed by folding two layers of second forming paper 2.

45 [0013] The inner tows S2 are 3.0-12.0 Y in denier per filament and 15000-35000 D in denier of all filaments; and generally, 3.9 Y/31000 D, 3.0 Y/32000 D, 3.0 Y/35000 D or 3.8 Y/34000 D, which may be selected according to a design requirement of the filter stick. Generally, a common filter stick is 3.0-3.9 Y and 31000-35000 D, a medium filter stick is 3.8-6.7 Y and 22000-34000 D, and a fine filter stick is 6.0-12.0 Y and 15000-16000 D.

[0014] Preferably, the inner and outer layers of forming paper may be flavored separately or simultaneously.

50 [0015] A second aspect is represented by a forming method of an externally-hollow filter stick with a filled core, which uses a filter stick one-time forming system.

[0016] The filter stick one-time forming system includes the following components: a forming trumpet-like mouth C, an outer forming paper conveying belt 3W, an inner forming paper conveying belt 3N and an inner tow conveying belt 52; the forming trumpet-like mouth C includes an outer forming trumpet-like mouth 11 and an inner forming trumpet-like mouth 21, and the inner forming trumpet-like mouth 21 is sleeved with the outer forming trumpet-like mouth 11; the outer forming trumpet-like mouth 11 is in a cylindrical shape with a radius decreasing gradually; and the inner forming trumpet-like mouth 21 has two layers, an outer layer 211 is in a cylindrical shape which transits gradually from a circle to a regular triangle, and an inner layer 212 is in a triangular prism shape with one end being a large-area regular triangle and the
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other end being a small-area regular triangle.

[0017] The forming method of the externally-hollow filter stick with the filled core includes the following steps: conveying outer forming paper W by the outer forming paper conveying belt 3W to an inlet of the forming trumpet-like mouth C to be baked by an outer forming paper baking device 31 and then enter a cylinder of the outer forming trumpet-like mouth 11 to be formed as a cylinder W1 shape and applied with an adhesive by an outer lap adhesive device 33 to come out of an outlet of the outer forming trumpet-like mouth 11; meanwhile, conveying inner forming paper N by the inner forming paper conveying belt 3N to the inlet of the forming trumpet-like mouth C to be baked by an inner forming paper baking device 32 and then enter a position between the outer layer 211 and the inner layer 212 of the inner forming trumpet-like mouth 21 to be formed gradually as a cylinder of the regular triangle N1 and applied with an adhesive by an inner lap adhesive device 33 to come out of an outlet of the inner forming trumpet-like mouth 21; at the moment, delivering inner tows S2 conveyed from an inner tow conveying belt 52 into the inner forming paper N; sleeving the cylinder of the regular triangle N1 and the cylinder W1 coming out of the outlet of the outer forming trumpet-like mouth 11 together, and filling an interior of the inner forming paper N with the inner tows S2; and applying an adhesive to the formed filter stick by an adhesive device 35, then gluing three vertexes of the regular triangle N1 to an inner wall surface of the cylinder W1, heating by a heater 36, performing cooling forming by a cooler 37, cutting by a cutter 38 and then outputting by a separator roll 39, so as to obtain the externally-hollow filter stick with the filled core.

[0018] The externally-hollow filter stick with the filled core obtained by the present invention may be used as a base stick A, the base stick A and another filter stick B of different types such as a filter capsule filter stick, a particle filter stick and a flavored filter stick are subjected to one-time combination according to a certain sequence and length ratio, so as to prepare an externally-hollow binary filter stick with a filled core, and the base stick A and the filter sticks B1 and B2 are subjected to two-time recombination according to a certain sequence and length ratio, so as to prepare an externally-hollow ternary filter stick with a filled core. The filter stick is put on a cigarette making machine to be connected with a cigarette, and then the externally-hollow filter stick with the filled core is arranged at a lip end of the cigarette.

[0019] Beneficial effects of the present invention are:

1. By using the inner forming paper and the outer forming paper with different quantities in the present invention, the externally-hollow filter stick with the filled core is prepared, so that different functions are achieved; filtering permeability is improved through the outer layer, so easiness is improved; and a space of the inner layer is filled with tows, so that filtering efficiency may be improved. A hollow filter stick obtained through a method in the prior art cannot be internally filled with the tows due to thermoforming, differentiated processing by using an existing flavoring technology is unavailable, and a filtering effect of a hollow filter stick section is not achieved.

2. The present invention designs and prepares the forming trumpet-like mouth autonomously. The forming trumpet-like mouth includes the outer forming trumpet-like mouth and the inner forming trumpet-like mouth, and the inner forming trumpet-like mouth is sleeved with the outer forming trumpet-like mouth; the outer forming trumpet-like mouth is in a cylindrical shape with a radius decreasing gradually; and the inner forming trumpet-like mouth has two layers, an outer layer is in a cylindrical shape which transits gradually from a circle to a regular triangle, and an inner layer is in a triangular prism shape with one end being a large-area regular triangle and the other end being a small-area regular triangle. The forming trumpet-like mouth of the present invention easily make the inner forming paper and the outer forming paper form a required shape by one-time forming; and large-scale industrial production is easy.

3. The inner and outer layers of forming paper of the present invention are glued together, the inner layer of forming paper is filled with the tows, and there is a cavity between the outer layer of forming paper and the inner layer of forming paper, which is different from a position and a mechanism of a hollow structure in an existing hollow filter stick for smoke gas circulation; and the triangular filter stick with the filled core of the present invention may better gather smoke gas, smoke gas is softer and more delicate, smoothness is good with clustering, smoking quality is mellow, and convergence is high.

4. According to the externally-hollow filter stick with the filled core of the present invention, the inner layer is filled with the tows, forming paper flavoring and tow flavoring cooperate, so a flavoring effect of the tows may be better achieved, cigarette flavor is better gathered, cigarette aroma quality is improved, an aroma volume is enhanced, and sensory quality of the cigarette may be improved effectively.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020]

Fig. 1 is a schematic diagram of a cross section of a vertical center axis of an externally-hollow filter stick with a

filled core in accordance with the present invention.

Fig. 2 is a schematic diagram of a forming trumpet-like mouth in accordance with the present invention.

Fig. 3 is a schematic diagram of an inner forming trumpet-like mouth in accordance with the present invention.

Fig. 4 is a schematic diagram of a one-time forming system of an externally-hollow filter stick with a filled core in accordance with the present invention.

[0021] Reference numerals: 11, outer forming trumpet-like mouth; 111, fixing point; 21, inner forming trumpet-like mouth; 211, outer layer; 212, inner layer; 3W, outer forming paper conveying belt; 3N, inner forming paper conveying belt; 31, outer forming paper baking device; 32, inner forming paper baking device; 33, inner lap adhesive device; 34, outer lap adhesive device; 35, adhesive device; 36, heater; 37, cooler; 38, cutter; 39, separator roll; 51, inner tow pack; 52, inner tow conveying belt; 53, inner additive box; W, outer forming paper; N, inner forming paper; W1, cylinder; N1, regular triangle, C, forming trumpet-like mouth; and S2, inner tow.

DETAILED DESCRIPTION

[0022] The present invention is further described below through an embodiment but not limited to this embodiment. An experiment method without indicating specific conditions in the embodiment usually adopts a normal condition as well as a condition in a manual, or a general device, a material, a reagent and the like used in a condition recommended by a manufacturer, which may be commercially available without additional comments. Raw materials needed in the following embodiment and comparative example are available in the market.

[0023] As shown in Fig. 1, Fig. 1 is a schematic diagram of a cross section of a vertical center axis of an externally-hollow filter stick with a filled core in the present invention. A first aspect of the present invention discloses an externally-hollow filter stick with a filled core. The externally-hollow filter stick with the filled core is cylindrical in appearance and is composed of an outer layer which is a cylinder W1 formed by rolling outer forming paper W and an inner layer which is in a cylindrical shape with a cross section being a regular triangle N1 in an axial direction of the cylinder W1 formed by folding inner forming paper N; and three vertexes of the regular triangle N1 are on an inner wall surface of the cylinder W1, wherein an interior of the inner forming paper N is filled with inner tows S2. The quantity of the inner forming paper N is 30-40 g/m². The quantity of the outer forming paper W is 90-110 g/m². The regular triangle N1 is formed by folding two layers of second forming paper 2. The inner tows S2 are 3.0-12.0 Y in denier per filament and 15000-35000 D in denier of all filaments.

[0024] A second aspect of the present invention discloses a forming method of an externally-hollow filter stick with a filled core, which uses a filter stick one-time forming system.

[0025] As shown in Fig. 4, the filter stick one-time forming system includes the following components: a forming trumpet-like mouth C, an outer forming paper conveying belt 3W, an inner forming paper conveying belt 3N and an inner tow conveying belt 52. As shown in Fig. 2, the forming trumpet-like mouth C includes an outer forming trumpet-like mouth 11 and an inner forming trumpet-like mouth 21, and the inner forming trumpet-like mouth 11 is sleeved with the outer forming trumpet-like mouth 21; the outer forming trumpet-like mouth 11 is in a cylindrical shape with a radius decreasing gradually. As shown in Fig. 3, the inner forming trumpet-like mouth 21 has two layers, an outer layer 211 is in a cylindrical shape which transits gradually from a circle to a regular triangle, and an inner layer 212 is in a triangular prism shape with one end being a large-area regular triangle and the other end being a small-area regular triangle.

[0026] The forming method of the triangular filter stick with the filled core includes the following steps: outer forming paper W is conveyed by the outer forming paper conveying belt 3W to an inlet of the forming trumpet-like mouth C to be baked by an outer forming paper baking device 31 and then enter a cylinder of the outer forming trumpet-like mouth 11 to be formed as a cylinder W1 shape and applied with an adhesive by an outer lap adhesive device 33 to come out of an outlet of the outer forming trumpet-like mouth 11; meanwhile, inner forming paper N is conveyed by the inner forming paper conveying belt 3N to the inlet of the forming trumpet-like mouth C to be baked by an inner forming paper baking device 32 and then enter a position between the outer layer 211 and the inner layer 212 of the inner forming trumpet-like mouth 21 to be formed gradually as a cylinder of the regular triangle N1 and applied with an adhesive by an inner lap adhesive device 33 to come out of an outlet of the inner forming trumpet-like mouth 21; at the moment, inner tows S2 conveyed from an inner tow conveying belt 52 are delivered into the inner forming paper N; the cylinder of the regular triangle N1 and the cylinder W1 coming out of the outlet of the outer forming trumpet-like mouth 11 are sleeved together, and an interior of the inner forming paper N is filled with the inner tows S2; and an adhesive is applied to the formed filter stick by an adhesive device 35, then three vertexes of the regular triangle N1 are glued to an inner wall surface of the cylinder W1, heating is performed by a heater 36, cooling forming is performed by a cooler 37, cutting is performed by a cutter 38 and then outputting is performed by a separator roll 39, so as to obtain the externally-hollow filter stick with the filled core.

[0027] The externally-hollow filter stick with the filled core prepared in the present invention is used as a base stick A, the base stick A and another filter stick B of different types such as a filter capsule filter stick, a particle filter stick and

a flavored filter stick are subjected to one-time combination according to a certain sequence and length ratio, so as to prepare an externally-hollow binary filter stick with a filled core, and the base stick A and the filter sticks B1 and B2 are subjected to two-time recombination according to a certain sequence and length ratio, so as to prepare an externally-hollow ternary filter stick with a filled core. The filter stick is put on a cigarette making machine to be connected with a cigarette, and then the externally-hollow filter stick with the filled core is arranged at a lip end of the cigarette.

[0028] Running conditions of the method of the present invention and a method in the prior art and comparison of results of obtained cigarettes:

Production method	Aroma quality	Aroma volume	Softness and delicacy	Mellowness	Convergence	Sensory quality of cigarette
Method of the present invention	14	16.5	5	5	4.5	91.5
Method in the prior art	13	14.5	3.5	3.5	3	90.0

[0029] It may be known from the above comparison results that the filter stick prepared through the method of the present invention is connected with a prepared cigarette, smoke gas is gathered and softer and more delicate, smoothness is good with clustering, smoking quality is mellow, convergence is high, the aroma quality and the aroma volume are improved, and sensory quality of cigarette may be improved effectively.

[0030] The above displays and describes a basic principle, main features and strengths of the present invention. Those skilled in the art should understand that the present invention is not limited to the above embodiment, descriptions in the above embodiment and the specification are only for explaining the principle of the present invention.

Claims

1. A forming method of an externally-hollow filter stick with a filled core,

wherein

the externally-hollow filter stick is cylindrical in appearance and is composed of an outer layer which is a cylinder (W1) formed by rolling outer forming paper (W) and an inner layer which is in a cylindrical shape with a cross section being a regular triangle (N1) in an axial direction of the cylinder (W1) formed by folding inner forming paper (N); and wherein three vertexes of the regular triangle (N1) are on an inner wall surface of the cylinder (W1), wherein an interior of the inner forming paper (N) is filled with inner tows (S2);

the quantity of the inner forming paper (N) is 30-40 g/m²;

the quantity of the outer forming paper (W) is 90-110 g/m²;

the regular triangle (N1) is formed by folding two layers of second forming paper (2);

the inner tows (S2) are 3.0-12.0 denier per filament (Y) and 15000-35000 denier of all filaments (D);

wherein the method uses a filter stick one-time forming system which comprises the following components:

a forming trumpet-like mouth (C), an outer forming paper conveying belt (3W), an inner forming paper conveying belt (3N) and an inner tow conveying belt (52); the forming trumpet-like mouth (C) comprises an outer forming trumpet-like mouth (11) and an inner forming trumpet-like mouth (21), and the inner forming trumpet-like mouth (21) is sleeved with the outer forming trumpet-like mouth (11); the outer forming trumpet-like mouth (11) is in a cylindrical shape with a radius decreasing gradually; and the inner forming trumpet-like mouth (21) has two layers, an outer layer (211) is in a cylindrical shape which transits gradually from a circle to a regular triangle, and an inner layer (212) is in a triangular prism shape with one end being a large-area regular triangle and the other end being a small-area regular triangle; and

the forming method of the externally-hollow filter stick with the filled core comprises the following steps: conveying the outer forming paper (W) by the outer forming paper conveying belt (3W) to an inlet of the forming trumpet-like mouth (C) to be baked by an outer forming paper baking device (31) and then entering a cylinder of the outer forming trumpet-like mouth (11) to be formed as the cylinder (W1) shape and being applied with an adhesive by an outer lap adhesive device (34) to come out of an outlet of the outer forming trumpet-like mouth (11); meanwhile, conveying the inner forming paper (N) by the inner forming paper conveying belt (3N) to the inlet of the forming trumpet-like mouth (C) to be baked by an inner forming paper baking device (32) and then entering a position between the outer layer (211) and the inner layer (212) of the inner forming trumpet-like mouth (21) to be formed gradually as a cylinder of the regular triangle (N1) and being applied with an adhesive by an inner lap adhesive device (33) to come out of an outlet of the inner forming trumpet-like mouth (21); at

that moment, delivering the inner tows (S2) conveyed from an inner tow conveying belt (52) into the inner forming paper (N); sleeving the cylinder of the regular triangle (N1) and the cylinder (W1) coming out of the outlet of the outer forming trumpet-like mouth (11) together, and filling an interior of the inner forming paper (N) with the inner tows (S2); and applying an adhesive to the formed filter stick by an adhesive device (35), then gluing three vertexes of the regular triangle (N1) to an inner wall surface of the cylinder (W1), Performing heating by a heater (36), performing cooling forming by a cooler (37), performing cutting by a cutter (38) and then outputting the filter stick by a separator roll (39), so as to obtain the externally-hollow filter stick with the filled core.

Patentansprüche

1. Verfahren zum Bilden eines außen hohlen Filterstabs mit einem gefüllten Kern, wobei der außen hohle Filterstab ein zylindrisches Aussehen hat und aus einer äußeren Schicht, die ein Zylinder (W1) ist, der durch Walzen von äußerem Formpapier (W) gebildet wird, und einer inneren Schicht zusammengesetzt ist, die eine zylindrische Form mit einem Querschnitt aufweist, der ein regelmäßiges Dreieck (N1) in einer axialen Richtung des Zylinders (W1) ist, das durch Falten von innerem Formpapier (N) gebildet wird; und wobei drei Eckpunkte des regelmäßigen Dreiecks (N1) auf einer inneren Wandoberfläche des Zylinders (W1) liegen, wobei ein Innenraum des inneren Formpapiers (N) mit inneren Fäden (S2) gefüllt ist;

die Menge des inneren Formpapiers (N) beträgt 30-40 g/m²

die Menge des äußeren Formpapiers (W) beträgt 90-110 g/m²;

das regelmäßige Dreieck (N1) ist durch Falten von zwei Lagen zweiten Formpapiers (2) gebildet;

die inneren Fäden (S2) weisen 3,0-12,0 Denier pro Filament (Y) und 15000-35000 Denier aller Filamente (D) auf;

wobei das Verfahren ein System zum einmaligen Bilden eines Filterstabs verwendet, das die folgenden Komponenten umfasst:

eine trompetenartige Formöffnung (C), ein äußeres Formpapierförderband (3W), ein inneres Formpapierförderband (3N) und ein inneres Fadenförderband (52); die trompetenartige Formöffnung (C) umfasst eine äußere trompetenartige Formöffnung (11) und eine innere trompetenartige Form Öffnung (21), und die innere trompetenartige Formöffnung (21) ist mit der äußeren trompetenartigen Formöffnung (11) umhüllt; die äußere trompetenartige Formöffnung (11) hat eine zylindrische Form mit einem Radius, der allmählich abnimmt; und die innere trompetenartige Formöffnung (21) hat zwei Schichten, eine äußere Schicht (211) hat eine zylindrische Form, die allmählich von einem Kreis in ein regelmäßiges Dreieck übergeht, und eine innere Schicht (212) hat die Form eines dreieckigen Prismas, wobei ein Ende ein großflächiges regelmäßiges Dreieck ist und das andere Ende ein kleinflächiges regelmäßiges Dreieck ist; und das Verfahren zum Bilden des außen hohlen Filterstabs mit dem gefüllten Kern umfasst die folgenden Schritte: Fördern des äußeren Formpapiers (W) durch das äußere Formpapier-Förderband (3W) zu einem Einlass der trompetenartigen Formöffnung (C), um durch eine äußere Formpapier-Backvorrichtung (31) gebacken zu werden, und dann Eintreten in einen Zylinder der äußeren trompetenartigen Formöffnung (11), um als die Zylinderform (W1) geformt zu werden, und Auftragen eines Klebstoffs durch eine äußere Umlauf-Klebevorrichtung (34), um aus einem Auslass der äußeren trompetenartigen Formöffnung (11) herauszukommen; währenddessen, Fördern des inneren Formpapiers (N) durch das innere Formpapier-Förderband (3N) zu dem Einlass der trompetenartigen Formöffnung (C), um durch eine innere Formpapier-Backvorrichtung (32) gebacken zu werden, und dann Eintreten in eine Position zwischen der äußeren Schicht (211) und der inneren Schicht (212) der inneren trompetenartigen Formöffnung (21), um allmählich als ein Zylinder des regelmäßigen Dreiecks (N1) geformt zu werden, und Auftragen eines Klebstoffs durch eine innere Umlauf-Klebevorrichtung (33), um aus einem Auslass der inneren trompetenartigen Formöffnung (21) herauszukommen; zu diesem Zeitpunkt Zuführen der inneren Fäden (S2), die von einem inneren Fadenförderband (52) in das innere Formpapier (N) befördert werden; gemeinsames Umhüllen des Zylinders des regelmäßigen Dreiecks (N1) und des Zylinders (W1), der aus dem Auslass der äußeren trompetenartigen Form Öffnung (11) herauskommt, und Füllen eines Innenraums des inneren Formpapier (N) mit den inneren Fäden (S2); und Auftragen eines Klebstoffs auf den geformten Filterstab mittels einer Klebstoff-Vorrichtung (35), dann Verkleben von drei Eckpunkten des regelmäßigen Dreiecks (N1) mit einer Innenwandfläche des Zylinders (W1), Durchführen eines Erhitzens mittels einer Heizvorrichtung (36), Durchführen eines Abkühlens des geformten Papiers mittels einer Kühlvorrichtung (37), Durchführen eines Schneidens mittels einer Schneidvorrichtung (38) und anschließendes Ausgeben des Filterstabs mittels einer Trennwalze (39), um den außen hohlen Filterstab mit dem gefüllten Kern zu erhalten.

Revendications

1. Méthode de formation d'un bâtonnet filtrant creux à l'extérieur avec un noyau rempli, dans laquelle

le bâtonnet filtrant creux à l'extérieur est d'apparence cylindrique et se compose d'une couche extérieure qui est un cylindre (W1) formé par rouler du papier de formation extérieur (W) et d'une couche intérieure de forme cylindrique dont la section transversale est un triangle régulier (N1) dans une direction axiale du cylindre (W1) formé par le pliage du papier de formation intérieure (N) ; et dans lequel

trois sommets du triangle régulier (N1) se trouvent sur une surface de la paroi intérieure du cylindre (W1), dans lequel l'intérieur du papier de formation intérieure (N) est rempli d'étoupes intérieures (S2) ;

la quantité de papier de formation intérieure (N) est de 30-40 g/m² ;

la quantité de papier de formation extérieur (W) est de 90-110 g/m² ;

le triangle régulier (N1) est formé par pliage de deux couches de deuxième papier de formation (2) ;

les étoupes intérieures (S2) sont de 3,0-12,0 deniers par filament (Y) et de 15000-35000 deniers pour l'ensemble des filaments (D) ;

dans laquelle la méthode utilise un système de formation unique de bâtonnet filtrant qui comprend les composants suivants :

une bouche de formation en forme de trompette (C), une bande de transport de papier de formation extérieure (3W), une bande de transport de papier de formation intérieure (3N) et une bande de transport d'étoupe intérieure (52) ; la bouche de formation en forme de trompette (C) comprend une bouche de formation en forme de trompette extérieure (11) et une bouche de formation en forme de trompette intérieure (21), et la bouche de formation en forme de trompette intérieure (21) est manchonnée avec la bouche de formation en forme de trompette extérieure (11) ; la bouche de formation en forme de trompette extérieure (11) a une forme cylindrique dont le rayon diminue progressivement ; et la bouche de formation en forme de trompette intérieure (21) a deux couches, une couche extérieure (211) ayant une forme cylindrique qui passe progressivement d'un cercle à un triangle régulier, et une couche intérieure (212) ayant une forme de prisme triangulaire dont une extrémité est un triangle régulier de grande surface et l'autre extrémité un triangle régulier de petite surface ; et

la méthode de formation du bâtonnet filtrant creux à l'extérieur avec le noyau rempli comprend les étapes suivantes :

transporter le papier de formation extérieur (W) par la bande de transport du papier de formation extérieur (3W) vers une entrée de la bouche de formation en forme de trompette (C) pour être cuit par un dispositif de cuisson du papier de formation extérieur (31), puis entrer dans un cylindre de la bouche de formation en forme de trompette extérieur (11) pour être formé en forme de cylindre (W1) et être appliqué avec un adhésif par un dispositif d'adhésif de recouvrement extérieur (34) pour sortir d'une sortie de la bouche de formation en forme de trompette extérieur (11) ;

entre-temps, transporter le papier de formation intérieure (N) par la bande de transport de papier de formation intérieure (3N) vers l'entrée de la bouche de formation en forme de trompette (C) pour être cuit par un dispositif de cuisson de papier de formation intérieure (32) et entrer ensuite dans une position entre la couche extérieure (211) et la couche intérieure (212) de la bouche de formation en forme de trompette intérieure (21) pour être formé progressivement comme un cylindre du triangle régulier (N1) et être appliqué avec un adhésif par un dispositif d'adhésif de recouvrement intérieur (33) pour sortir d'une sortie de la bouche de formation en forme de trompette intérieure (21) ; à ce moment, délivrer les étoupes intérieures (S2) transportés par une bande de transport d'étoupes intérieures (52) dans le papier de formation intérieur (N) ; manchonner ensemble le cylindre du triangle régulier (N1) et le cylindre (W1) sortant de la sortie de la bouche en forme de trompette extérieure (11), et remplir un intérieur du papier de formation intérieure (N) avec les étoupes intérieures (S2) ; et appliquer un adhésif sur le bâtonnet filtrant formé par un dispositif adhésif (35), puis coller trois sommets du triangle régulier (N1) sur une surface de paroi intérieure du cylindre (W1), chauffer par un réchauffeur (36), refroidir par un refroidisseur (37), couper par un cutter (38) et sortir le bâtonnet filtrant par un rouleau séparateur (39), de manière à obtenir le bâtonnet filtrant creusé à l'extérieur avec le noyau rempli.

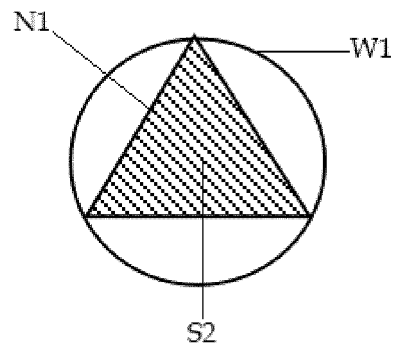


Fig. 1

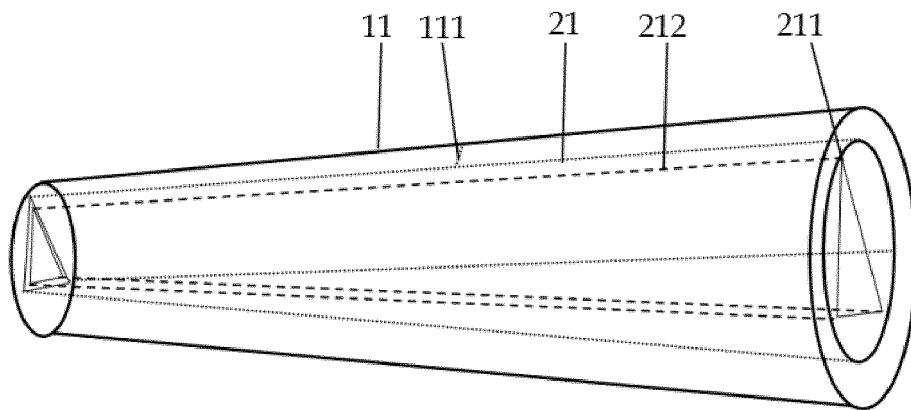


Fig. 2

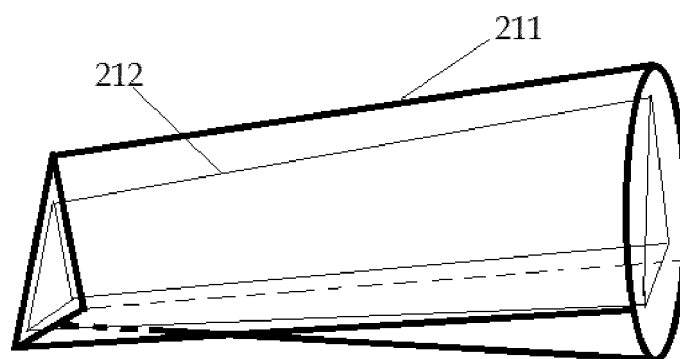


Fig. 3

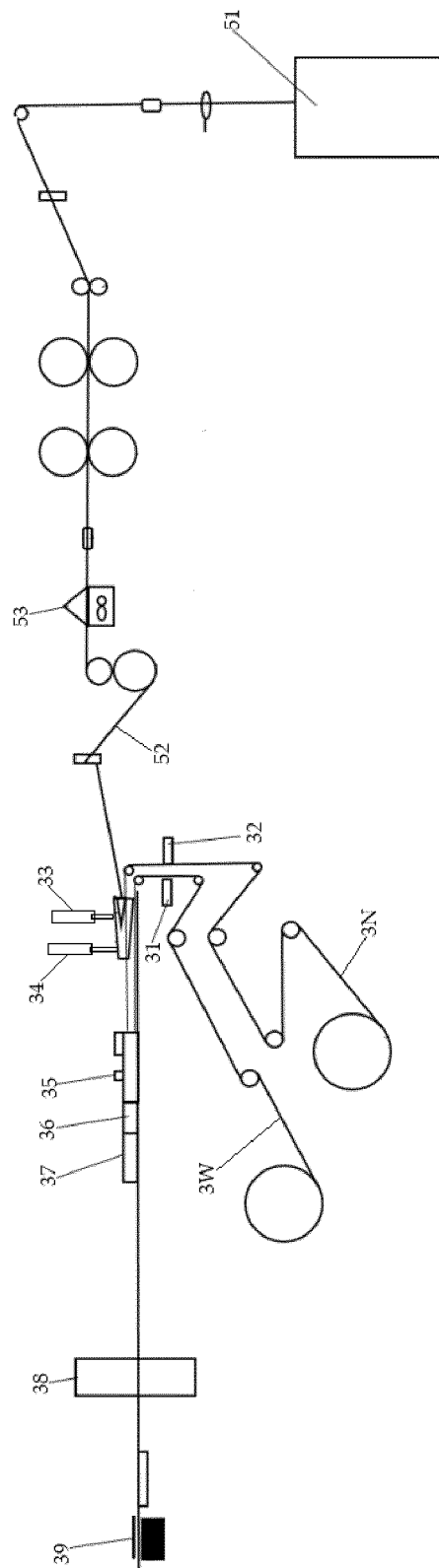


Fig. 4

REFERENCES CITED IN THE DESCRIPTION

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