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(54) **HEATING CIGARETTE WITH ADJUSTABLE TUBE WALL AIR PERMEABILITY AND AIR PERMEATION POSITION, AND ADJUSTMENT METHOD**

HEIZZIGARETTE MIT EINSTELLBARER ROHRWANDLUFTDURCHLÄSSIGKEIT UND PERMEATIONSPOSITION UND EINSTELLVERFAHREN DAFÜR

CIGARETTE CHAUFFANTE AYANT UNE PERMÉABILITÉ À L'AIR DE PAROI DE TUBE ET UNE POSITION DE PERMÉATION DE L'AIR RÉGLABLES, ET PROCÉDÉ DE RÉGLAGE

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Description**TECHNICAL FIELD**

- 5 **[0001]** The present disclosure belongs to the technical field of heating cigarette, and in particular, to a heating cigarette with adjustable pipe-wall air permeability and an adjusting method therefor.

BACKGROUND

- 10 **[0002]** With consumers' increasing attention to health and demand for personalized experience of cigarette products, various heating cigarettes with reduced coke and harm have been developed as a continuous response to the upgrading of consumers' needs. Among which, heat-not-burning cigarettes can provide a healthier smoking experience while satisfying consumers' sensory requirements for cigarette products due to their different heating methods from traditional cigarette products.
- 15 **[0003]** Existing heating cigarettes mainly include a smoking core material segment, a hollow support segment, a cooling segment and a filter segment. In order to introduce air, increase ventilation volume and effectively reduce the temperature of the smoke, the method of online laser drilling is often used to perforate in the hollow support segment of the heating cigarette, and the pipe wall of the hollow support segment as well as the shaping paper and tipping paper wrapping the hollow support segment are perforated to form ventilation pores and introduce air; however, this method still has the
- 20 following problems: 1. The process of online laser drilling has higher requirements on the pipe-wall material and thickness of the hollow support segment, the material of the hollow support segment pipe wall can neither collapse during the process, nor be too thick to perforate during the process; 2. the process of online laser drilling has high requirements on laser power, in case laser drilling equipment fails to perforate the pipe wall of the hollow support segment, problems of unqualified heating cigarettes and overheating of smoke temperature may arise; 3. at present, ventilation pores are formed
- 25 by punching through the hollow support segment as well as the shaping paper and tipping paper wrapping the hollow support segment, outside air directly enters the hollow support segment through the ventilation pores, quick air introduction of ventilation pores, limited contact area between the introduced air and the smoke, and uneven mixing may result in an increase in the amount of smoke inhaled into the consumer's mouth, while smoke concentration is low as it is obviously mixed with a large amount of air, so that smoking quality is seriously affected.
- 30 **[0004]** CN109998161A discloses a heating non-combustible cigarette with a ventilation window, the cigarette sequentially comprising a smoke generating core material section, a hollow supporting section and a filtering section. EP 3 632 231 describes a smokeless cigarette which comprises a filter tip, a heat-resistant hollow section and a tobacco section sequentially connected. CN111449276 discloses heat-not-burn articles with an empty tube structure. The outer wall of the tube is made of either cellulose acetate or non-woven fabric. The air permeable tipping paper covers the entire length of the
- 35 empty tube structure.
- [0005]** Besides, problems of using physical perforation method to make the wall of heating cigarette pipe ventilate include nonadjustable permeability volume and fixed permeability position; as introduction of air through physical perforation only lies in where to perforate and where to introduce ambient air for ventilation and cooling, permeability rate is fixed with the size of the hole. However, as the smoking segment material or the adapted smoking apparatus
- 40 changes, it is desirable that air permeability of the heating cigarette can be adjusted.
- [0006]** Thus, it is desirable to design a heating cigarette that can ensure not only the cooling effect for the smoke, but also the smoking amount and the quality of the smoke, as well as air permeability and its volume of the heating cigarette can be adjusted.
- [0007]** The present disclosure is proposed to solve the above problems.

SUMMARY

- 45 **[0008]** A first aspect of the present disclosure provides a heating cigarette with adjustable pipe-wall air permeability, the heating cigarette with adjustable pipe-wall air permeability includes a smoking segment 1 and a heating cigarette filter rod with natural permeability function, the smoking segment and the heating cigarette filter rod are assembled and molded by a
- 50 shaping paper 4; a tipping paper 5 wraps around at least part of the outer side of the shaping paper 4 wrapping the heating cigarette filter rod with natural permeability function;

55 From the distal lip end to the proximal lip end, the heating cigarette filter rod with natural permeability function sequentially includes a smoke extraction segment 2 and a functional filter rod segment 3, the smoke extraction segment 2 has permeability function itself, outside air can enter the interior of the heating cigarette through the smoke extraction segment 2;

The tipping paper 5 only partially wraps the smoke extraction segment 2, at least part of the outer part of the smoke

extraction segment 2 close to the smoking segment 1 is only equipped with the shaping paper 4, without being wrapped by the tipping paper 5;

The shaping paper 4 is permeable, while the tipping paper 5 is impermeable, the length of the tipping paper 5 is adjustable.

[0009] The smoke extraction segment 2 has a hollow structure, including a pipe wall 21 and a pipe cavity 22. The pipe wall 21 does not need to be perforated due to its permeability function, there are ventilation pores disposed inside the pipe wall 21, outside air can enter the pipe cavity 22 through the ventilation pores inside the pipe wall 21. Wherein, the cross-segmental area of the pipe cavity 22 is not limited to a circle, which can also be of any shape such as a triangle, a polygon, or a pentagram.

[0010] Preferably, the tipping paper 5 covers 1/6-5/6 of the axial length of the smoke extraction segment 2.

[0011] Preferably, air permeability of the shaping paper 4 is 1000-10000CU.

[0012] The pipe wall 21 is molded by particles adhesion and extrusion, and the voids among the particles after molding are used as the ventilation pores, the pipe wall 21 itself has a permeability function;

The particle diameter is 200-25000 microns; after the particles is molded into the pipe wall of a hollow pipe, the thickness of the pipe wall 21 is 1.0-2.0mm, and the voids among the particles in the pipe wall 21 are in dispersed form with a porosity of 50-80%.

[0013] Preferably, the particles are selected from organic particles or inorganic particles, among which the inorganic particles include aluminum oxide, zirconia, calcium carbonate, glass beads, silica, iron, copper, aluminum, gold, platinum, magnesium silicate balls or calcium sulfate; while organic particles include at least one of cellulose acetate, cellulose acetate propionate, cellulose acetate butyrate, microcrystalline cellulose, sucrose powder, dextrin, lactose, powdered sugar, glucose, mannitol, starch, methylcellulose, ethylcellulose, polylactic acid, polyethylene, polypropylene, polyhydroxybutyrate, poly(ϵ -caprolactone), polyglycolic acid, polyhydroxyalkanoate, starch-based thermoplastic resin.

[0014] Preferably, binders among particles include: at least one of polyethylene, polypropylene, polylactic acid, polyolefin, polyester, polyamide, polyacrylic acid polyvinyl compound, polytetrafluoroethylene, polyether ether ketone, polyethylene terephthalate, polybutylene terephthalate, polycyclohexamethylene terephthalate, polypropylene terephthalate, polyacrylate acid compounds, polymethyl methacrylate, acrylonitrile-butadiene-styrene, styrene-acrylonitrile, styrene-butadiene, styrene-maleic acid, cellulose acetate, cellulose acetate butyrate, plasticized cellulose plastic, cellulose propionate, or ethyl cellulose, or any derivative, copolymer as well as any combination thereof.

[0015] Preferably, the pipe wall 21 is made of a cellulose acetate tow, the filling amount of the cellulose acetate tow is based on medium cigarettes at this time, after the cellulose acetate tow forms the pipe wall of a hollow pipe, the thickness of the pipe wall 21 is 1.0-3.0mm. At this time, the filling amount of the acetate cellulose tow is based on medium cigarettes, and when its size of filter rod circumference is 19.8mm, 2000-4500 filaments are filled.

[0016] Preferably, the pipe wall 21 is made of an air-permeable ceramic material.

[0017] In other words, the shaping paper 4 in this heating cigarette structure has assembly function in the following two aspects: (1) the smoke extraction segment 2 and the functional filter rod segment 3 are assembled to form the heating cigarette filter rod with natural permeability function; (2) assembling the heating cigarette filter rod with natural permeability function and the smoking segment 1 to form a heating cigarette. However, the tipping paper does not play the role of assembly, it is used to control the permeability volume and position of the smoke extraction segment 2 through controlling the length of the tipping paper; meanwhile, the tipping paper can also print patterns and LOGO as conventional purposes.

[0018] A second aspect of the present disclosure provides a method for adjusting the heating cigarette with adjustable pipe-wall air permeability of the first aspect of the present disclosure, air permeability of the smoke extraction segment 2 can be adjusted by adjusting the size and position of the area of the smoke extraction segment 2 covered by the tipping paper 5, thereby adjusting air permeability of the heating cigarette.

[0019] Besides, the heating cigarette filter rod with natural permeability function of the present disclosure is not limited to only include the smoke extraction segment 2 and the functional filter rod segment 3; according to actual needs, it can also be a ternary composite structure, other functional segments such as support segment, cooling segment, and aroma enhancement segment can be added.

[0020] Compared with the prior art, the present disclosure has the following beneficial effects:

1. The heating cigarette with adjustable pipe-wall air permeability of the present disclosure, includes a smoke extraction segment 2 with permeability function itself, outside air can enter the inside of the heating cigarette through the smoke extraction segment 2; the tipping paper 5 only partially wraps the smoke extraction segment 2, the outer part of the smoke extraction segment 2 close to the smoking segment 1 is only equipped with the shaping paper 4, without being wrapped by the tipping paper 5; the shaping paper 4 is permeable, while the tipping paper 5 is impermeable, the length and position of the tipping paper 5 are adjustable, so that air permeability of the smoke extraction segment 2 can be adjusted by adjusting the size and position of the area of the smoke extraction segment 2 covered by the tipping paper 5, thereby adjusting air permeability of the heating cigarette. Due to the cigarette

structure of the present disclosure, air permeability volume and position of the smoke extraction segment 2 can be more flexibly controlled through controlling the length of the tipping paper 5.

2. The heating cigarette filter rod with natural permeability function of the present disclosure includes a smoke extraction segment 2, wherein the pipe wall 21 of the smoke extraction segment 2 does not need to be perforated due to its permeability, there are ventilation pores inside the pipe wall 21, outside air can enter the pipe cavity 22 through the ventilation pores inside the pipe wall 21; in other words, the pipe wall 21 itself has pores with natural ventilation effect, the shaping paper 4 and the tipping paper 5 are used together to achieve permeability of the pipe wall of the cooling segment, outside air enters the inside of the heating cigarette through the pores to mix with the smoke, so as to achieve the purpose of introducing air into the inside of the heating cigarette without perforating while avoiding the problems caused by perforating on the pipe wall 21 of the smoke extraction segment 2.

3. In the preferred embodiment of the present disclosure, the pipe wall 21 is molded by particles adhesion and extrusion, the voids among particles play a role of natural ventilation after molding; after the particles form a hollow pipe, the voids among the particles in the pipe wall are dispersed, compared with directly perforating the cooling segment, the air introduced into the smoke extraction segment filled with particles of the present disclosure is more dispersed, while ensuring that the amount of air introduced is enough for cooling, the air can also be uniformly introduced into the heating cigarette, so that the air introduced and smoke are mixed more evenly, thus solving the problem of poor smoke quality due to uneven mixing of air and smoke, just like the drilling process mentioned before, which only guarantees the introduction of a large amount of air to achieve the cooling effect.

4. In case the particles are used in solid cooling rods, although the cooling effect is good, the smoke must pass through the particle pores in the solid cooling rods to reach the filter tip for consumers to smoke, leading to a large amount of smoke adsorption of the solid cooling rods. In the present disclosure, while introducing air to reduce the temperature of the smoke, selection of particle materials is also critical. The particle materials of the present disclosure are selected from those with a cooling effect, when the smoke passes through, the pipe wall material of the smoke extraction segment can also cool down the smoke.

5. In the preferred embodiment of the present disclosure, the pipe wall 21 is an acetate cellulose tow, which is not the traditional acetate tow used for filters, the acetate tow used for the pipe wall 21 of the present disclosure is based on medium cigarettes, making the acetate tow itself porous and permeable, like a window screen with grid. Compared with directly perforating the cooling segment, the air introduced into the smoke extraction segment of the acetate tow is more dispersed, while ensuring that the amount of air introduced is enough for cooling, the air can also be uniformly introduced into the heating cigarette, so that the air introduced and smoke are mixed more evenly, thus solving the problem of poor smoke quality due to uneven mixing of air and smoke, just like the drilling process mentioned before, which only guarantees the introduction of a large amount of air to achieve the cooling effect.

6. In the preferred embodiment of the present disclosure, the pipe wall 21 can also be made of a permeable ceramic material with permeability function while providing support.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021]

FIG. 1 is a structural schematic view of the actual effect of the smoke extraction segment in the heating cigarette of Embodiment 1; wherein the pipe wall of the smoke extraction segment 2 is molded by particle bonding and extrusion; FIG. 2 is a structural schematic view of the theoretical effect of smoke extraction segment in the heating cigarette of Embodiment 1;

FIG. 3 is a structural schematic view of the heating cigarette in Embodiment 1 of the present disclosure;

FIG. 4 is the structural schematic view of the heating cigarette in Embodiment 2;

[0022] The names of reference signs in the description of figures are as follows: 1. Smoking segment, 2. Smoke extraction segment, 3. Functional filter rod segment, 4. Shaping paper, 5. Tipping paper; 21. Pipe wall, 22. Pipe cavity.

DETAILED DESCRIPTION OF THE EMBODIMENT

[0023] The present disclosure will be further explained below through specific embodiment.

[0024] It is understood by those skilled in the art that, the following embodiments are only for illustrating the present disclosure and should not be interpreted as limiting the scope of the present disclosure. In case no specific technique or condition is indicated in the embodiment, the technique or condition described in the literature in the field or the product specification is based on. In case the materials or equipment used are not indicated with the manufacturer, they are all ordinary products that can be obtained through purchase.

[0025] It can be understood by those skilled in the art that, the singular forms "a", "an" and "the" used herein can include

the plural forms as well, unless expressly stated otherwise. It should be further understood that "including" used in the description of the present disclosure means that the features, integers, steps, operations, elements and/or components exist; however, the existence or addition of one or more other features, integers, steps, operations, elements, components and/or their groups thereof is not excluded. It should be understood that, when an element is referred to be "connected" to another one, it may be directly connected to another element, or there may be intermediate elements as well. Moreover, "connection" as used herein may include wireless connections.

[0026] In the description of the present disclosure, unless otherwise stated, "a plurality of" means two or more. The orientation or state relationship indicated by the terms "inside", "above", "below", etc. is based on that shown in the figures, which is only for convenience of describing the present disclosure and simplifying description, rather than indicating or implying that the device or element must have a particular orientation, or must be constructed and operated in a particular orientation, and thus should not be interpreted as limitations of the present disclosure.

[0027] In the description of the present disclosure, it should be noted that, the terms "mount", "connect" and "provided with" should be interpreted broadly unless otherwise expressly specified and defined, such as fixed connection, detachable connection, or integral connection; either mechanical connection or electrical connection; direct connection or indirect connection through intermediate media. The specific meanings of the terms above in the present disclosure can be understood by persons skilled in the art in actual conditions.

[0028] It is understood by those skilled in the art that, unless otherwise defined, all terms including technical and scientific terms used herein have the same meanings as commonly understood by the ordinary persons skilled in the art to the technical field to which the present disclosure belongs. It should also be understood that terms such as those defined in the general dictionary should be understood to have meanings consistent with those in the context of the prior art; moreover, unless defined as herein, the terms may not be explained with idealized or overly formal senses.

Embodiment 1

[0029] As shown in FIGS.1-3, the embodiment shows a heating cigarette sample 1 with adjustable pipe-wall air permeability, the heating cigarette with adjustable pipe-wall air permeability includes a smoking segment 1 and a heating cigarette filter rod with natural permeability function, the smoking segment and the filter rod are assembled and molded by a shaping paper 4; a tipping paper 5 wraps around the outer side of the shaping paper 4 wrapping the heating cigarette filter rod with natural permeability function;

From the distal lip end to the proximal lip end, the heating cigarette filter rod with natural permeability function sequentially includes a smoke extraction segment 2 and a functional filter rod segment 3, the smoke extraction segment 2 has permeability function itself, outside air can enter the interior of the heating cigarette through the smoke extraction segment 2;

The tipping paper 5 only partially wraps the smoke extraction segment 2, the outer part of the smoke extraction segment 2 close to the smoking segment 1 is only equipped with the shaping paper 4, without being wrapped by the tipping paper 5;

The shaping paper 4 is permeable, while the tipping paper 5 is impermeable, the length and position of the tipping paper 5 are adjustable.

[0030] The smoke extraction segment 2 has a hollow structure, including a pipe wall 21 and a pipe cavity 22. The pipe wall 21 does not need to be perforated due to its permeability function, there are ventilation pores disposed inside the pipe wall 21, outside air can enter the pipe cavity 22 through the ventilation pores inside the pipe wall 21.

[0031] The tipping paper 5 covers 1/2 of the axial length of the smoke extraction segment 2. The air permeability of the shaping paper 4 is 1000CU.

[0032] The pipe wall 21 is molded by particle bonding and extrusion, the voids among the particles after molding play a role of natural ventilation.

[0033] The particle diameter is 200-25000 microns; after the particles is molded into the pipe wall of a hollow pipe, the thickness of the pipe wall 21 is 1.5 mm, the voids among the particles in the pipe wall 21 are in dispersed form with a porosity of 50%. The particles are selected from inorganic particles of aluminum oxide. The binder between particles is polylactic acid.

Embodiment 2

[0034] As shown in FIG.4, the embodiment shows a heating cigarette sample 2 with adjustable pipe-wall air permeability, the heating cigarette with adjustable pipe-wall air permeability includes a smoking segment 1 and a heating cigarette filter rod with natural permeability function, the smoking segment and the filter rod are assembled and molded by a shaping paper 4; a tipping paper 5 wraps around the outer side of the shaping paper 4 wrapping the heating cigarette filter

rod with natural permeability function;

From the distal lip end to the proximal lip end, the heating cigarette filter rod with natural permeability function sequentially includes a smoke extraction segment 2 and a functional filter rod segment 3, the smoke extraction segment 2 has permeability function itself, outside air can enter the interior of the heating cigarette through the smoke extraction segment 2;

The tipping paper 5 only partially wraps the smoke extraction segment 2, the outer part of the smoke extraction segment 2 close to the smoking segment 1 is only equipped with the shaping paper 4, without being wrapped by the tipping paper 5;

The shaping paper 4 is permeable, while the tipping paper 5 is impermeable, and the length and position of the tipping paper 5 are adjustable.

[0035] The smoke extraction segment 2 has a hollow structure, including a pipe wall 21 and a pipe cavity 22. The pipe wall 21 does not need to be perforated due to its permeability, there are ventilation pores disposed inside the pipe wall, outside air can enter the pipe cavity 22 through the ventilation pores inside the pipe wall 21.

[0036] The tipping paper 5 covers 1/3 of the axial length of the smoke extraction segment 2.

[0037] The pipe wall 21 is made of a cellulose acetate tow, and the filling amount of the cellulose acetate tow is based on medium cigarettes at this time, after the cellulose acetate tow forms the pipe wall of the hollow pipe, the thickness of the pipe wall 21 is 1.0mm. At this time, the filling amount of the acetate cellulose tow is based on medium cigarettes, and when its size of filter rod circumference is 19.8mm, 2833 filaments are filled.

Embodiment 3

[0038] For the heating cigarette sample 1 prepared in Embodiment 1 and the heating cigarette sample 2 prepared in Embodiment 2, according to QYNZYJ07.022-2015 standard, 20 professional sensory evaluation personnel at or above the provincial level are asked to smoke the cigarette samples, after evaluation, the scores are averaged, so that the following table 1 can be obtained.

Table 1 Sensory Quality Record of New Cigarettes

Standard basis: QYNZY.J07.022-2015

Item		Amount of smoke 10			Fragrance and aroma 30			Impact 10			Harmony 10			Irritation 15			Taste 25			Total 100
		I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	
No.	Sample category	10	8	6	30	25	20	10	8	6	10	8	6	15	12	9	25	22	20	
1	Sample 1	8.5			27.5			8.5			8.5			13.5			23.5			90.0
2	Sample 2	8.5			27.0			8.5			8.5			13.5			23.0			89.0

[0039] It can be seen from Table 1 above that Sample 1 is better than Sample 2 in terms of aroma and taste as air permeability amount in Sample 2 is larger than that in Sample 1, resulting in a larger amount of air introduced, thereby reducing the aroma and fragrance of the smoke itself; thus, the permeability volume and position of the smoke extraction segment should be adjusted appropriately according to different smoking core materials.

Claims

1. A heating cigarette with adjustable pipe-wall air permeability, **characterized in that**, the heating cigarette with adjustable pipe-wall air permeability comprises a smoking segment (1) and a heating cigarette filter rod with natural

permeability function, the smoking segment and the heating cigarette filter rod are assembled and molded by a shaping paper (4); a tipping paper (5) wraps around at least part of the outer side of the shaping paper (4) wrapping the heating cigarette filter rod with natural permeability function;

From the distal lip end to the proximal lip end, the heating cigarette filter rod with natural permeability function sequentially comprises a smoke extraction segment (2) and a functional filter rod segment (3), the smoke extraction segment (2) has permeability function itself, outside air can enter the interior of the heating cigarette through the smoke extraction segment (2);

The tipping paper (5) only partially wraps the smoke extraction segment (2), at least part of the outer part of the smoke extraction segment (2) close to the smoking segment (1) is only equipped with the shaping paper (4), without being wrapped by the tipping paper (5);

The shaping paper (4) is air permeable, while the tipping paper (5) is air impermeable, the length of the tipping paper (5) is adjustable;

the smoke extraction segment (2) has a hollow structure, comprising a pipe wall (21) and a pipe cavity (22), the pipe wall (21) does not need to be perforated due to its permeability function; there are ventilation pores disposed inside the pipe wall (21), outside air can enter the pipe cavity (22) through the ventilation pores inside the pipe wall (21);

the pipe wall (21) is molded by particles adhesion and extrusion, and the voids among the particles after molding are used as the ventilation pores, so that the pipe wall (21) itself has a permeability function;

the particle diameter is 200-25000 microns; after the particles is molded into the pipe wall of a hollow pipe, the thickness of the pipe wall (21) is 1.0-2.0 mm, and the voids among the particles in the pipe wall (21) are in dispersed form with a porosity of 50-80%.

2. The heating cigarette with adjustable pipe-wall air permeability of claim 1, **characterized in that** the tipping paper (5) covers 1/6-5/6 of the axial length of the smoke extraction segment (2).

3. The heating cigarette with adjustable pipe-wall air permeability of claim 1, **characterized in that**, air permeability of the shaping paper (4) is 1000-10000CU.

4. The heating cigarette with adjustable pipe-wall air permeability of claim 1, **characterized in that**, the particles are selected from organic particles or inorganic particles, among which the inorganic particles include aluminum oxide, zirconia, calcium carbonate, glass beads, silica, iron, copper, aluminum, gold, platinum, magnesium silicate balls or calcium sulfate; while organic particles include at least one of cellulose acetate, cellulose acetate propionate, cellulose acetate butyrate, microcrystalline cellulose, sucrose powder, dextrin, lactose, powdered sugar, glucose, mannitol, starch, methylcellulose, ethylcellulose, polylactic acid, polyethylene, polypropylene, polyhydroxybutyrate, poly(ϵ -caprolactone), polyglycolic acid, polyhydroxyalkanoate, starch-based thermoplastic resin.

5. The heating cigarette with adjustable pipe-wall air permeability of claim 1, **characterized in that**, binders among particles comprise: at least one of polyethylene, polypropylene, polylactic acid, polyolefin, polyester, polyamide, polyacrylic acid polyvinyl compound, polytetrafluoroethylene, polyether ether ketone, polyethylene terephthalate, polybutylene terephthalate, polycyclohexamethylene terephthalate, polypropylene terephthalate, polyacrylate acid compounds, polymethyl methacrylate, acrylonitrile-butadiene-styrene, styrene-acrylonitrile, styrene-butadiene, styrene-maleic acid, cellulose acetate, cellulose acetate butyrate, plasticized cellulose plastic, cellulose propionate, or ethyl cellulose, or any derivative, copolymer as well as any combination thereof.

6. A method for adjusting the heating cigarette with adjustable pipe-wall air permeability of claim 1, **characterized in that**, air permeability of the smoke extraction segment (2) can be adjusted by adjusting the size of the area of the smoke extraction segment (2) covered by the tipping paper (5), thereby adjusting air permeability of the heating cigarette.

Patentansprüche

1. Eine Heizzigarette mit einstellbarer Luftdurchlässigkeit der Rohrwand, **dadurch gekennzeichnet, dass** die Heizzigarette mit einstellbarer Luftdurchlässigkeit der Rohrwand ein Rauchsegment (1) und einen Heizzigarettenfilterstab mit natürlicher Durchlässigkeitsfunktion umfasst, wobei das Rauchsegment und der Heizzigarettenfilterstab durch ein Formgebungspapier (4) zusammengesetzt und geformt sind; ein Mundstückpapier (5) umhüllt mindestens einen Teil der Außenseite des Formgebungspapiers (4), das den Heizzigarettenfilterstab mit natürlicher Durchlässigkeits-

funktion umhüllt;

Vom distalen Lippenende bis zum proximalen Lippenende umfasst der Heizzigarettenfilterstab mit natürlicher Durchlässigkeitsfunktion nacheinander ein Rauchabzugsegment (2) und ein funktionelles Filterstabsegment (3), wobei das Rauchabzugsegment (2) selbst eine Durchlässigkeitsfunktion aufweist, Außenluft durch das Rauch-

abzugsegment (2) in das Innere der Heizzigarette gelangen kann;
Das Mundstückpapier (5) umhüllt das Rauchabzugsegment (2) nur teilweise, zumindest ein Teil des äußeren Teils des Rauchabzugsegments (2) in der Nähe des Rauchsegments (1) ist nur mit dem Formgebungspapier (4) ausgestattet, ohne von dem Mundstückpapier (5) umhüllt zu sein;

Das Formgebungspapier (4) ist luftdurchlässig, während das Mundstückpapier (5) luftundurchlässig ist, wobei die Länge des Mundstückpapiers (5) einstellbar ist;

Das Rauchabzugssegment (2) hat eine hohle Struktur, die eine Rohrwand (21) und einen Rohrhohlraum (22) umfasst, wobei die Rohrwand (21) aufgrund ihrer Durchlässigkeitsfunktion nicht perforiert sein muss; in der Rohrwand (21) sind Belüftungsporen angeordnet, Außenluft kann durch die Belüftungsporen in den Rohrhohlraum (22) gelangen;

die Rohrwand (21) ist durch Partikeladhäsion und -extrusion geformt, und die Hohlräume zwischen den Partikeln nach dem Formen werden als Belüftungsporen verwendet, sodass die Rohrwand (21) selbst eine Durchlässigkeitsfunktion hat;

der Partikeldurchmesser beträgt 200-25000 Mikrometer; nach dem Formen der Partikel zu der Rohrwand eines Hohlrohrs beträgt die Dicke der Rohrwand (21) 1,0-2,0 mm, und die Hohlräume zwischen den Partikeln in der Rohrwand (21) liegen in dispergierter Form mit einer Porosität von 50-80 % vor.

2. Die Heizzigarette mit einstellbarer Luftdurchlässigkeit der Rohrwand nach Anspruch 1, **dadurch gekennzeichnet, dass** das Mundstückpapier (5) 1/6-5/6 der axialen Länge des Rauchabzugsegments (2) bedeckt.

3. Die Heizzigarette mit einstellbarer Luftdurchlässigkeit der Rohrwand nach Anspruch 1, **dadurch gekennzeichnet, dass** die Luftdurchlässigkeit des Formgebungspapiers (4) 1000-10000CU beträgt.

4. Die Heizzigarette mit einstellbarer Luftdurchlässigkeit der Rohrwand nach Anspruch 1, **dadurch gekennzeichnet, dass** die Partikel aus organischen Partikeln oder anorganischen Partikeln ausgewählt sind, wobei die anorganischen Partikel Aluminiumoxid, Zirkonoxid, Calciumcarbonat, Glaskugeln, Siliciumdioxid, Eisen, Kupfer, Aluminium, Gold, Platin, Magnesiumsilikat kugeln oder Calciumsulfat enthalten, während organische Partikel mindestens eines enthalten aus Celluloseacetat, Celluloseacetatpropionat, Celluloseacetatbutyrat, mikrokristalline Cellulose, Saccharosepulver, Dextrin, Lactose, Puderzucker, Glucose, Mannit, Stärke, Methylcellulose, Ethylcellulose, Polymilchsäure, Polyethylen, Polypropylen, Polyhydroxybutyrat, Poly(ϵ -caprolacton), Polyglycolsäure, Polyhydroxyalkanoat, thermoplastisches Harz auf Stärkebasis.

5. Die Heizzigarette mit einstellbarer Luftdurchlässigkeit der Rohrwand nach Anspruch 1, **dadurch gekennzeichnet, dass** Bindemittel zwischen den Partikeln mindestens eines enthalten aus Polyethylen, Polypropylen, Polymilchsäure, Polyolefin, Polyester, Polyamid, Polyacrylsäure, Polyvinylverbindung, Polytetrafluorethylen, Polyetheretherketon, Polyethylenterephthalat, Polybutylenterephthalat, Polycyclohexamethylenterephthalat, Polypropylenterephthalat, Polyacrylsäureverbindungen, Polymethylmethacrylat, Acrylnitril-Butadien-Styrol, Styrol-Acrylnitril, Styrol-Butadien, Styrol-Maleinsäure, Celluloseacetat, Celluloseacetatbutyrat, plastifizierter Cellulosekunststoff, Cellulosepropionat oder Ethylcellulose oder jedes Derivat, Copolymer sowie jede Kombination davon.

6. Ein Verfahren zur Einstellung der Heizzigarette mit einstellbarer Luftdurchlässigkeit der Rohrwand nach Anspruch 1, **dadurch gekennzeichnet, dass** die Luftdurchlässigkeit des Rauchabzugsegments (2) durch Einstellen der Größe des Bereichs des Rauchabzugsegments (2), der vom Mundstückpapier (5) bedeckt ist, eingestellt werden kann, wodurch die Luftdurchlässigkeit der Heizzigarette eingestellt wird.

Revendications

1. Cigarette chauffante avec perméabilité à l'air réglable de paroi de tuyau, **caractérisée en ce que** la cigarette chauffante avec perméabilité à l'air réglable de paroi de tuyau comprend un segment de fumage (1) et une tige filtrante de cigarette chauffante avec fonction de perméabilité naturelle, le segment de fumage et la tige filtrante de cigarette chauffante sont assemblés et moulés par un papier de formage (4) ; un papier de basculement (5) s'enroule au moins entour d'une partie du côté extérieur du papier de formage (4) enroulant la tige filtrante de cigarette chauffante avec

fonction de perméabilité naturelle ;

De l'extrémité distale de lèvres à l'extrémité proximale de lèvres, la tige filtrante de cigarette chauffante avec fonction de perméabilité naturelle comprend séquentiellement un segment d'extraction de la fumée (2) et un segment de tige filtrante fonctionnelle (3), le segment d'extraction de la fumée (2) a lui-même une fonction de perméabilité, de l'air extérieur peut pénétrer à l'intérieur de la cigarette chauffante à travers le segment d'extraction de la fumée (2) ;

Le papier de basculement (5) n'enroule que partiellement le segment d'extraction de la fumée (2), au moins une partie de la partie extérieure du segment d'extraction de la fumée (2) proche du segment de fumage (1) est seulement équipée du papier de formage (4), sans être enroulée par le papier de basculement (5) ;

Le papier de formage (4) est perméable à l'air, tandis que le papier de basculement (5) est imperméable à l'air, la longueur du papier de basculement (5) est ajustable ;

le segment d'extraction de la fumée (2) a une structure creuse, comprenant une paroi de tuyau (21) et une cavité de tuyau (22), la paroi de tuyau (21) n'a pas besoin d'être perforée en raison de sa fonction de perméabilité ; il y a des pores de ventilation disposés à l'intérieur de la paroi de tuyau (21), de l'air extérieur peut pénétrer dans la cavité de tuyau (22) à travers les pores de ventilation à l'intérieur de la paroi de tuyau (21) ;

la paroi de tuyau (21) est moulée par l'adhésion et l'extrusion de particules, et les vides parmi les particules après le moulage sont utilisés comme pores de ventilation, de sorte que la paroi de tuyau (21) elle-même a une fonction de perméabilité ;

le diamètre de particule est de 200 à 25000 microns ; après les particules sont moulés dans la paroi de tuyau d'un tuyau creux, l'épaisseur de la paroi de tuyau (21) est de 1,0 - 2,0 mm, et les vides parmi les particules dans la paroi de tuyau (21) sont sous forme dispersée, avec une porosité de 50 à 80 %.

2. La cigarette chauffante avec perméabilité à l'air réglable de paroi de tuyau selon la revendication 1, **caractérisée en ce que** le papier de basculement (5) couvre 1/6 - 5/6 de la longueur axiale du segment d'extraction de la fumée (2).

3. La cigarette chauffante avec perméabilité à l'air réglable de paroi de tuyau selon la revendication 1, **caractérisée en ce que** la perméabilité à l'air du papier de formage (4) est de 1000 - 10000 CU.

4. La cigarette chauffante avec perméabilité à l'air réglable de paroi de tuyau de la revendication 1, **caractérisée en ce que** les particules sont choisies parmi les particules organiques ou les particules inorganiques, parmi lesquelles les particules inorganiques incluent de l'oxyde d'aluminium, de la zircone, du carbonate de calcium, des billes de verre, de la silice, du fer, du cuivre, de l'aluminium, de l'or, du platine, des billes de silicate de magnésium ou du sulfate de calcium ; tandis que les particules organiques incluent au moins un de l'acétate de cellulose, de l'acétate de cellulose propionate, de l'acétate de cellulose butyrate, de la cellulose microcristalline, de la poudre de saccharose, de la dextrine, du lactose, du sucre en poudre, du glucose, du mannitol, de l'amidon, de la méthylcellulose, de l'éthylcellulose, de l'acide polylactique, du polyéthylène, du polypropylène, du polyhydroxybutyrate, du poly(ϵ -caprolactone), de l'acide polyglycolique, du polyhydroxyalcanoate, de la résine thermoplastique à base d'amidon.

5. La cigarette chauffante avec perméabilité à l'air réglable de paroi de tuyau selon la revendication 1, **caractérisée en ce que** les liants parmi les particules comprennent : au moins un du polyéthylène, du polypropylène, de l'acide polylactique, de la polyoléfine, du polyester, du polyamide, de l'acide polyacrylique, du composé polyvinylique, du polytétrafluoroéthylène, du polyéther-éther-cétone, du polyéthylène téréphtalate, du polybutylène téréphtalate, du polycyclohexaméthylène téréphtalate, du polypropylène téréphtalate, des composés de l'acide polyacrylate, du polyméthacrylate de méthyle, de l'acrylonitrile-butadiène-styrène, du styrène-acrylonitrile, du styrène-butadiène, de l'acide styrène-maléique, de l'acétate de cellulose, du butyrate d'acétate de cellulose, du plastique de cellulose plastifié, du propionate de cellulose ou de la cellulose éthylique, ou de tout dérivé, du copolymère ainsi que de toute combinaison de ceux-ci.

6. Méthode pour ajuster la cigarette chauffante avec perméabilité à l'air réglable de paroi de tuyau selon la revendication 1, **caractérisée en ce que** la perméabilité à l'air du segment d'extraction de la fumée (2) peut être réglée en réglant la taille de la zone du segment d'extraction de la fumée (2) couverte par le papier de basculement (5), réglant ainsi la perméabilité à l'air de la cigarette chauffante.

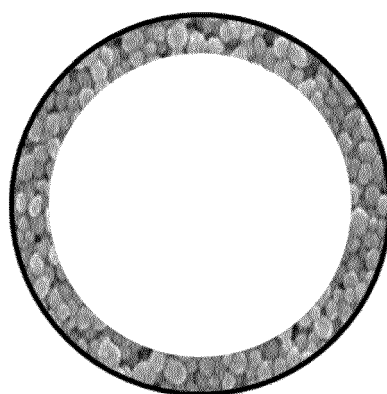


FIG. 1

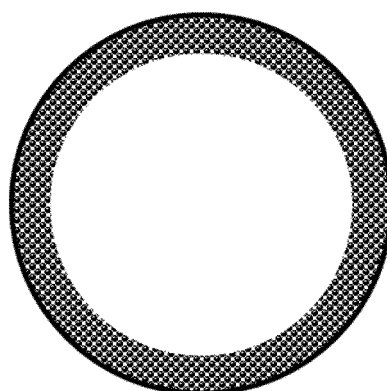


FIG. 2

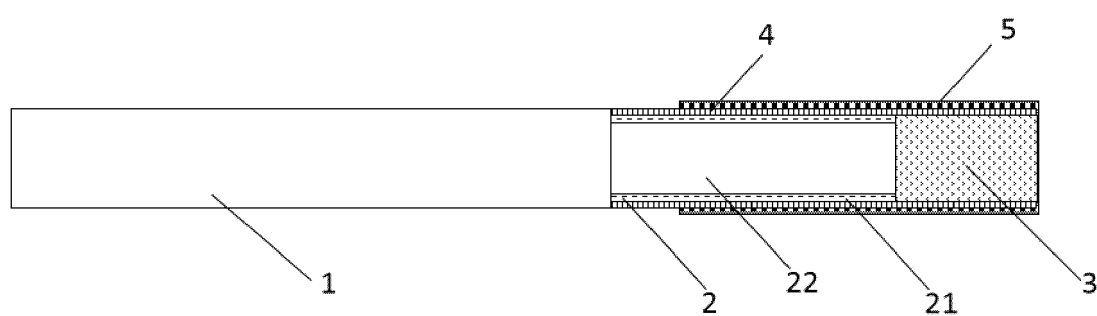


FIG. 3

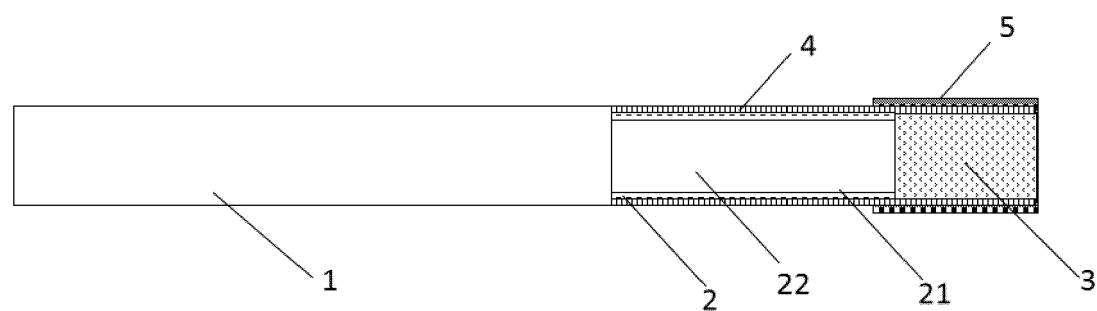


FIG. 4

REFERENCES CITED IN THE DESCRIPTION

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