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(54) **METHOD OF PRODUCING AN IMPROVED WICK FOR CANDLES AND IMPROVED WICK**

(57) The present invention relates to a method for producing an improved wick for candles comprising the sequential steps of: (i) providing a wick; (ii) relaxing the wick by transporting the wick over rollers; (iii) immersing the wick in a wax bath provided with a molten wick wax, whereby the wick is coated with the wick wax, wherein the wick wax comprises a combination of a flexible wax, a hard wax, and a high-melting wax, wherein a flexible wax is defined as a wax having a hardness between 15 and 25 dmm at 25°C, wherein a hard wax is defined as a wax having a hardness between 5 and 15 dmm at 25°C, and wherein a high-melting wax is defined as a wax with a melting point between 60 and 100°C, preferably between 70 and 90°C.

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Description

TECHNICAL FIELD

[0001] The invention relates to a method for producing an improved wick for candles. The invention also relates to an improved wick and the use of an improved wick in candles.

PRIOR ART

[0002] Wicks intended for candles are often coated with a wick wax in a first production step. This is especially important with container candles. In the production of candles, the quality of the wick wax is often overlooked. However, the composition of the wick wax is of enormous importance to obtain good burning behavior. For example, the wick must be easy to fix in the wick holder and the wick must remain upright during the pouring of the candle.

[0003] Known wicks often deviate from the ideal wick position during burning, so that the wick end is not in the hottest zone of the flame. As a result, the wick will not automatically be shortened during burning, resulting in a lot of residue formation and mushrooming. This often requires a manual correction of the wick while the candle is burning. In addition, known wicks often fall over when an amount of hot wax is poured over the wick construction during the production process of the candle. A manual correction is then also necessary. In addition, a firm wick wax is also important during the burning process when part of the wax is warm and liquid, because if the wick wax is not firm enough, the wick will fall over, possibly resulting in drowning. At the end of the burning cycle, this can also have safety consequences. A falling wick can ignite the remaining wax or create a secondary flame.

[0004] Another disadvantage of known wicks and wick waxes is that the wick wax melts off in the warm pool of wax during the production process and the burning process, so that the wick can also fall over here.

[0005] The braided or knitted wicks are often supplied on a roll. This causes internal tension in the wick, so that the wick position is not correct when burning. Moreover, during the production process the wick is also often under tension, which will cause stress formation in the wick and thus during burning. As a result, the wick again deviates from the ideal wick position during burning.

[0006] There is a need for an improved method for producing stable wicks for candles that maintain the perfect wick position during burning and wherein during production of the wicks no tension is built up.

[0007] A wick is known from US4790747 but is only applicable to taper and pillar candles. In addition, applying a stiffening coating to the wick or part of the candle is known from US4790747 and US5439376A, but these wicks are often not flexible enough. US2745271 describes a waxed wick impregnated with a wax composition consisting of about 40-60% of a crystalline paraffin wax with a melting point of about 50-55°C and 40-60% of a petroleum wax with a melting point of about 68-74°C. US2011027736 describes a candle with a planar wick. US2302146 describes another candle with wick and rigidity device.

[0008] The present invention aims to find a solution for at least some of the above problems.

SUMMARY OF THE INVENTION

[0009] The invention relates to a method for producing an improved wick for candles according to claim 1.

[0010] This invention describes a method for producing an improved wick on the basis of an renewed wick wax and an optimized wick waxing process to optimally apply this wick wax to the wick.

[0011] The wick waxing process in this invention ensures that no tension is built up in the wick during the waxing process. During the wick production process, the wick is transported via rollers, after which it passes through a wax bath. It is important that at the time of applying the wick wax there is no tension in the wick. To ensure this, the wick is sufficiently relaxed during the wick waxing process. The method has the advantage that a wick is obtained that is flexible enough to be able to roll during and after the wick waxing process. In addition, the wick is flexible enough to be hammered into the wick holder in a candle installation. The method also ensures a wick that is sufficiently hard and rigid so that it remains nicely upright during the production process (including during the pouring of the liquid hot wax over the wick construction). In addition, the wick wax used in the wick waxing process also ensures that the wick is sufficiently strong so that it will not fall over during burning. This will also prevent the wax from igniting or the occurrence of a secondary flame. The wick wax composition is a combination of a flexible wick wax, a hard wick wax and a high-melting wax. As a result, all necessary properties are combined in a wick wax blend. The choice of wick wax blend also ensures that it is usable on high-speed machines.

[0012] Preferred forms of the method are presented in claims 2-10.

[0013] A specific preferred form concerns claim 2. The wick wax described consists of a combination of a flexible wick wax, a hard wick wax and a high-melting wax. This combination ensures the right properties to obtain a high-quality wick with optimal characteristics.

[0014] In a second aspect, the invention relates to an improved wick according to claim 11. The wick has the advantage that the wick is suitable for maintaining a desired wick position during the production of a candle and during the burning of the candle. A preferred form is shown in claims 12-13.

[0015] In a third aspect, the invention relates to a use of an improved wick according to claim 14. The use has the advantage that the wick maintains a desired wick position during the production of a candle, and more specifically during the hammering of the wick into a wick holder and during the pouring of the candle.

[0016] In a fourth aspect, the invention relates to a candle according to claim 15. The candle comprises an improved wick and a meltable wax mass.

DETAILED DESCRIPTION

[0017] The invention relates to a method for producing an improved wick for candles.

[0018] Unless otherwise defined, all terms used in the description of the invention, including technical and scientific terms, have the meanings as commonly understood by those skilled in the art of the invention. For a better assessment of the description of the invention, the following terms are explained explicitly.

[0019] In this document, "a", "an" and "the" refer to both the singular and the plural, unless the context clearly presupposes otherwise. For example, "a segment" means one or more than one segment.

[0020] The terms "comprise", "comprising", "provided with" are synonyms and are inclusive or open-ended terms that indicate the presence of what follows, and which do not exclude or prevent the presence of other components, features, elements, members, steps, as known from or disclosed in the prior art.

[0021] The terms "contain", "containing", "consist of", "consisting of", "include", "including" are synonyms and are exclusive or closed-ended terms indicating the presence of what follows, and which preclude or prevent the presence of other components, features, elements, members, steps known from or described in the art.

[0022] Quoting numeric intervals by the endpoints includes all integers, fractions, and/or real numbers between the endpoints, including those endpoints.

[0023] The term "Fischer-Tropsch (FT) synthesis" as used in the text refers to the process by which a mixture of carbon monoxide and hydrogen or water gas is converted into liquid hydrocarbons by various chemical reactions, such as hydrogenation, hydrogenolysis, dissociation, migratory insertion, etc. These reactions take place in the presence of metal catalysts, usually at temperatures of 150-300°C and pressures of one to several tens of atmospheres.

[0024] The term "Fischer-Tropsch (FT) wax" as used in the text means a hydrogenated paraffin wax obtained from the Fischer-Tropsch synthesis.

[0025] The term "paraffin", as used herein, is intended to mean a mixture of crystalline linear alkanes having 17 to 57 carbon atoms and linear chains, which are solid at room temperature and obtained from petroleum fractions and brown coal tar. The general molecular formula of such linear alkanes is $CH_3(CH_2)_nCH_3$.

[0026] In a first aspect, the invention relates to a method for producing an improved wick for candles.

[0027] In a preferred embodiment, the method comprises the sequential steps of:

i. providing a wick;
ii. relaxing the wick by transporting the wick over rollers;
iii. immersing the wick in a wax bath provided with a molten wick wax, whereby the wick is coated with the wick wax,

wherein the wick wax comprises a flexible wax, a hard wax, a high-melting wax or a combination thereof, wherein a flexible wax is defined as a wax having a hardness between 15 and 25 dmm at 25°C, wherein a hard wax is defined as a wax having a hardness between 5 and 15 dmm at 25°C, and wherein a high-melting wax is defined as a wax with a melting point between 60 and 100°C, preferably between 70 and 90°C.

[0028] In a preferred embodiment, the method comprises the sequential steps of:

i. providing a wick;
ii. transporting the wick over rollers;
iii. immersing the wick in a wax bath provided with a molten wick wax, whereby the wick is coated with the wick wax,

wherein the wick wax comprises a flexible wax, a hard wax, a high-melting wax or a combination thereof, wherein a flexible wax is defined as a wax having a hardness between 15 and 25 dmm at 25°C, wherein a hard wax is defined as a wax having a hardness between 5 and 15 dmm at 25°C, and wherein a high-melting wax is defined as a wax with a melting point between 60 and 100°C, preferably between 70 and 90°C.

[0029] This invention describes a method for producing an improved wick on the basis of an innovative wick wax and an optimized wick waxing process to optimally apply this wick wax to the wick.

[0030] The wick waxing process in this invention ensures that no tension is built up in the wick during the waxing

process. During the wick production method, the wick is transported via rollers, after which it passes through a wax bath. It is important that at the time of applying the wick wax there is no tension in the wick. To ensure this, the wick is sufficiently relaxed during the wick waxing process. The method has the advantage that a wick is obtained that is flexible enough to be able to roll during and after the wick waxing process. In addition, the wick is flexible enough to be hammered into the wick holder in a candle installation. The method also ensures a wick that is sufficiently hard and rigid so that it remains nicely upright during the production process (including during the pouring of the liquid hot wax over the wick construction). In addition, the wick wax used in the wick waxing process also ensures that the wick is sufficiently strong so that it will not fall over during burning. This will also prevent the wax from igniting or the occurrence of a secondary flame. The wick wax composition is a combination of a flexible wick wax, a hard wick wax and a high-melting wax. As a result, all necessary properties are combined in a wick wax composition. The choice of wick wax blend also ensures that it is usable on high-speed machines.

[0031] In step (i) of the method, a wick is provided. The wicks can be made of braided, woven, twisted or knitted fibers to promote slow and constant combustion. Twisted wicks are generally of lower quality than braided, woven or knitted wicks. They burn much faster because their loose construction allows more fuel to reach the flame quickly.

[0032] The wick can be a flat, square or cored wick. Flat wicks are knitted or braided wicks, usually made from three bundles of fiber. These wicks are very consistent in their burn and curl in the flame for a self-trimming effect. They are the most commonly used wicks and are generally found in taper and pillar candles.

[0033] Square wicks are braided or knitted wicks that also curl in the flame but are rounder and slightly more robust than flat wicks. They prefer beeswax and can help prevent the wick from clogging, which can happen with certain types of pigments or fragrances. Square wicks are most commonly used in taper and pillar candles.

[0034] Cored wicks are braided or knitted wicks and use a core material to keep the wick straight or upright while burning. The wicks have a round cross-section, and the use of different core materials creates a series of stiffness effects. The most common core materials for wicks are cotton, paper, or viscose, sometimes reinforced with metal threads. Candles with a core are used in jar candles, candleholders, votive candles, and ornamental lamps.

[0035] In an embodiment the wick is supplied in step (i) on a roll. In a further embodiment, the wick is then unrolled prior to step (ii).

[0036] In a second step (ii) of the method, the wick is transported over transport rollers to relax the wick. In the embodiment wherein the wick is supplied on a wick roller, relaxing the wick is important because the wick roller creates internal tension in the wick. To reduce the internal tension in the wick during unrolling and/or during the wick waxing process, the wick is guided via transport rollers before the actual wick waxing process.

[0037] The second step (ii) can thus also be written as "transporting the wick over rollers" with the effect of relaxing the wick.

[0038] Reducing the tension in the wick is necessary because if there is too much tension in the wick, the wick position is not correct when burning.

[0039] Afterwards, in a third step (iii), the wick is immersed in a wax bath provided with a molten wick wax, the wick being coated with the wick wax. Coating or "priming" the wick is especially important for candles in a container. In a pillar candle, the melt pool can overflow from the sides of the candle and the wick is still held firmly upright by the part of the candle that remains as a solid. In a candle in a container, the melt pool is left behind, and depending on the height or depth of the melt pool, the exposed wick may bend excessively in the melt pool and drown itself, thereby extinguishing the flame. Therefore, the wax layer on the wick usually has a higher melting point than the temperature of the melt pool (molten wax mass of the candle). This allows the wick to maintain its upright position in the melt pool.

[0040] The term "melt pool" refers to the wax that lies molten at the top of the candle during burning of a container candle. A container candle is a non-flammable receptacle filled with wax and a wick.

[0041] In a preferred form step (ii) and step (iii) are repeated, preferably step (ii) and step (iii) are repeated between once and five times. In another or further preferred form, step (ii) is repeated, preferably repeated between once and five times, before the wick is coated in step (iii). Step (iii) is then preferably repeated, preferably repeated between once and five times, so that several layers of wax are coated on the wick. In a further preferred form, the wick is also transported over the wick rollers between the application of two wax layers (step iii), so that the tension disappears from the wick and the wick has cooled down sufficiently for a subsequent wax layer.

[0042] The term "flexible wax" refers to a wax that has a hardness between 15 and 25 dmm at 25°C measured by needle penetration. The term "hard wax" is intended to mean a wax that has a hardness between 5 and 15 dmm at 25°C measured by needle penetration. The needle penetration is a method for determining the hardness of waxes, in which a standardized needle (100 g) is loaded with a weight for a certain time (5 seconds) at a certain temperature (25°C) and the penetration depth of the needle is determined in tenths of a millimeter. The numerical values indicate the range within which the needle penetration depth is located in the wax. For example, 15-25 dmm means that the penetration depth is between 15 and 25 mm.

[0043] A flexible wax can also be defined in another embodiment as a wax that is flexible enough not to be damaged in a 90° bend. In a preferred form, the term "flexible wax" refers to a wax that has a hardness between 15 and 25 dmm

at 25°C measured by needle penetration and is not damaged at 90° bending.

[0044] In a preferred form, the flexible wax has a melting point between 55 and 76°C, preferably between 56 and 75°C, more preferably between 57 and 74°C, even more preferably between 58 and 73°C, even more preferably between 59 and 72°C, even more preferably between 60 and 71°C. The melting point can be determined according to DIN ISO 2207 and/or ASTM D 938.

[0045] A hard wax can also be defined in another embodiment as a wax that breaks at a 90° bend. In a preferred form, the term "hard wax" is intended to mean a wax that has a hardness between 5 and 15 dmm at 25°C measured by needle penetration and breaks at a 90° bend.

[0046] In a preferred form, the hard wax has a melting point between 60 and 75°C, preferably between 61 and 74°C, more preferably between 62 and 73°C, even more preferably between 63 and 72°C, even more preferably between 64 and 71°C, even more preferably between 65 and 70°C. The melting point can be determined according to DIN ISO 2207 and/or ASTM D 938.

[0047] According to an embodiment, the flexible wax, the hard wax, or both are selected from the list of: paraffin wax, vegetable wax, or a combination thereof.

[0048] In a further embodiment, the flexible wax, the hard wax or both are paraffin waxes. In a preferred form, both the flexible wax and the hard wax are paraffin waxes. According to an embodiment, the paraffin wax is selected from the list of unrefined paraffin wax, partially refined paraffin wax, fully refined paraffin wax, or a combination thereof. Unrefined, fully and partially refined paraffin wax is known to those skilled in the art and the terms are intended to refer to paraffin waxes that are respectively not, fully or partially freed from impurities and decolorized by treatment with water or clay. Partially refined paraffin wax contains less than 1.8% oil, compared to fully refined paraffin wax, which contains less than 0.8% oil. It is water resistant and odorless.

[0049] In another further embodiment the flexible wax, the hard wax or both waxes are vegetable waxes. Vegetable waxes are preferably selected from the list of: palm oil, rapeseed oil, sunflower oil, shea butter, corn oil, coconut oil, soybean oil or a combination thereof. In a preferred form, the vegetable wax is a hydrogenated wax, such as, for example, a hydrogenated rapeseed wax.

[0050] The high-melting wax preferably has a hardness between 1 and 10 dmm at 25°C measured by needle penetration, more preferably between 4 and 9 dmm.

[0051] In an embodiment, the high-melting wax is a paraffin wax or a vegetable wax.

[0052] In a further embodiment, the high-melting wax is a hydrogenated paraffin wax. In a preferred form, the high-melting wax is a Fischer-Tropsch wax. In a further preferred form, the high-melting wax is produced synthetically using gas-to-liquid (GTL) technology. The GTL process uses a sustainable feedstock, natural gas, to produce high-quality Fischer-Tropsch waxes. In a preferred form, the high-melting wax is a linear Fischer-Tropsch wax. Fischer-Tropsch wax has the advantage that the melting curve is very narrow.

[0053] The Fischer-Tropsch wax also has the following advantages: synthetically produced; consistent high quality; low viscosity; high degree of linearity; wide melting range; high degree of crystallinity; excellent thermal stability; very low surface energy.

[0054] In an embodiment, the wick wax comprises flexible wax, preferably in an amount of up to 80 m%, more preferably in an amount of up to 70 m%, even more preferably in an amount of up to 60 m%. In another or further preferred form, the wick wax comprises flexible wax, preferably in an amount of at least 5 m%, more preferably in an amount of at least 10 m%, even more preferably in an amount of at least 20 m%, even more preferably in an amount of at least 30 m%, even more preferably in an amount of at least 40 m%. In another or further preferred form, the wick wax comprises flexible wax, in an amount of 5-80 m%, preferably in an amount of 10-70 m%, more preferably in an amount of 20-60 m%, even more preferably in an amount of 30-60 m%, even more preferably in an amount of 40-60 m%.

[0055] In an embodiment, the wick wax comprises hard wax, preferably in an amount of up to 70 m%, more preferably in an amount of up to 60 m%, even more preferably in an amount of up to 50 m%. In another or further preferred form, the wick wax comprises hard wax, preferably in an amount of at least 1 m%, more preferably in an amount of at least 5 m%, even more preferably in an amount of at least 10 m%, even more preferably in an amount of at least 15 m%, even more preferably in an amount of at least 20 m%. In another or further preferred form, the wick wax comprises hard wax, in an amount of 1-70 m%, preferably in an amount of 5-60 m%, more preferably in an amount of 10-50 m%, even more preferably in an amount of 15-50 m%, even more preferably in an amount of 20-50 m%.

[0056] In an embodiment, the wick wax comprises high-melting wax, preferably in an amount of up to 50 m%, more preferably in an amount of up to 40 m%, even more preferably in an amount of up to 30 m%. In another or further preferred form, the wick wax comprises high-melting wax, preferably in an amount of at least 0.1 m%, more preferably in an amount of at least 0.5 m%, even more preferably in an amount of at least 1 m%. In another or further preferred form, the wick wax comprises high-melting wax, in an amount of 0.1-50 m%, preferably in an amount of 0.1-40 m%, more preferably in an amount of 0.1-30 m%, even more preferably in an amount of 0.5-30 m%, even more preferably in an amount of 1-30 m%.

[0057] In a preferred form, the wick wax comprises a combination of a flexible wax, a hard wax and a high-melting wax.

[0058] In an embodiment, the wick wax comprises the following components:

- a flexible wax, in an amount of 5-80 m%, preferably 10-70 m%;
- a hard wax, in an amount of 1-70 m%, preferably 5-60 m%; and
- a high-melting wax, in an amount of 0.1-50 m%, preferably 0.1-40 m%.

[0059] In a preferred form, the wick wax comprises the following components:

- a flexible wax, in an amount of 20-60 m%;
- a hard wax, in an amount of 10-50 m%; and
- a high-melting wax, in an amount of 0.1-30 m%.

[0060] In a preferred form, the wick wax consists of:

- a flexible wax, in an amount of 20-60 m%;
- a hard wax, in an amount of 10-50 m%; and
- a high-melting wax, in an amount of 0.1-30 m%;
- impurities and/or additives in an amount of up to 5 m% of the wick wax, preferably in an amount of up to 3 m% of the wick wax, preferably in an amount of up to 2 m% of the wick wax, preferably in an amount of up to 1 m% of the wick wax, preferably in an amount of up to 0.5 m% of the wick wax, preferably in an amount of up to 0.1 m% of the wick wax.

[0061] In a preferred form, the molten wick wax is formed in the wax bath by melting the flexible wax, the hard wax and the high-melting wax together to 5°C above the melting point of the high-melting wax and mixing the molten waxes. In an embodiment, the waxes are melted together to a temperature of between 85 and 105°C, preferably between 85 and 100°C, more preferably between 85 and 95°C.

[0062] In a preferred form, the method optionally comprises the step of:

iv. removing excess wick wax on the wick by passing the wick through a die, opposing rollers or blades to remove the excess molten wick wax before the wax hardens.

[0063] In a preferred form, the method comprises the step of:

v. cooling the wick and winding the wick onto a roll.

[0064] After coating, the wick is first completely cooled down (i.e. to room temperature) before being put on a roll.

[0065] In a preferred embodiment, the method comprises the sequential steps of:

i. providing a wick;
ii. transporting the wick over rollers;
iii. immersing the wick in a wax bath provided with a molten wick wax, whereby the wick is coated with the wick wax,

wherein the wick wax comprises a combination of a flexible wax, a hard wax, and a high-melting wax, wherein a flexible wax is defined as a wax having a hardness between 15 and 25 dmm at 25°C, wherein a hard wax is defined as a wax having a hardness between 5 and 15 dmm at 25°C, and wherein a high-melting wax is defined as a wax with a melting point between 60 and 100°C, preferably between 70 and 90°C.

[0066] The obtained wick is preferably used in a tealight candle or a container candle.

[0067] In a second aspect, the invention relates to an improved wick.

[0068] In a preferred embodiment, the wick is suitable for maintaining a desired wick position during the production of a candle and during the burning of the candle.

[0069] The wick has the advantage that the wick is suitable for maintaining a desired wick position during the production of a candle and during the burning of the candle. The improved wick is especially advantageous for a tealight candle or a container candle.

[0070] In a preferred form, the improved wick according to the second aspect has been obtained according to a method according to the first aspect.

[0071] In a third aspect, the invention relates to a use of an improved wick according to the second aspect. The use has the advantage that the wick maintains a desired wick position during the production of a candle, and more specifically during the hammering of the wick into a wick holder and during the pouring of the candle.

[0072] In a fourth aspect, the invention relates to a candle. The candle comprises an improved wick and a meltable wax mass. In a preferred form, the candle is a tealight candle or a container candle.

[0073] In what follows, the invention is described by way of non-limiting examples illustrating the invention, and which are not intended to and should not be interpreted as limiting the scope of the invention.

EXAMPLES

EXAMPLES 1 AND 2

[0074] Examples 1 and 2 concern compositions of used wick waxes consisting of a flexible wax, hard wax and high-melting wax.

	Flexible wax	Hard wax	High-melting wax
Example 1	50 m%	40 m%	10 m%
Example 2	60 m%	25 m%	5 m%

[0075] The flexible wax in these examples is a paraffin wax with a melting point between 67-71°C (DIN ISO 2207), and a needle penetration at 25°C between 14 and 18 dmm. The flexible wax in these examples is a paraffin wax with a melting point between 66-70°C (DIN ISO 2207), and a needle penetration at 25°C between 10 and 14 dmm. The high-melting wax is a Fischer-Tropsch wax with a melting point between 80 and 85°C and a needle penetration at 25°C between 4 and 9 dmm. DIN ISO 2207 is preferably DIN ISO 2207:1980.

[0076] The wick coated with the wick wax (Example 1) maintained a nice upright position when filling the candle with liquid wax mass and held up well during burning in the hot melt pool.

[0077] The wick wax (Example 2) ensures fast processing and good adhesion of the coated wick in a wick plate.

EXAMPLE 3

[0078] Example 3 relates to a method for producing an improved wick for candles according to the first aspect of the present invention.

[0079] The flexible wick wax, the hard wax and the high-melting wax (Examples 1 and 2) are melted together in the wax bath to 90° and then mixed very well.

[0080] Subsequently, a braided or woven wick is provided on a wick roller. The wick is unrolled and is transported over the transport rollers between once and five times to decrease the internal tension in the wick. The wick is then passed through the wax bath between once and five times, whereby a coating is applied to the wick. Between the application of two wax layers (step iii), the wick is also transported over the wick rollers so that the tension disappears from the wick and the wick has cooled down sufficiently for a subsequent wax layer. After waxing the wick, the wick is first completely cooled to room temperature before being put onto the roller.

Claims

1. A method for producing an improved wick for candles comprising the sequential steps of:

i. providing a wick;
ii. relaxing the wick by transporting the wick over rollers;
iii. immersing the wick in a wax bath provided with a molten wick wax, whereby the wick is coated with the wick wax,

wherein the wick wax comprises a combination of a flexible wax, a hard wax, and a high-melting wax, wherein a flexible wax is defined as a wax having a hardness between 15 and 25 dmm at 25°C, wherein a hard wax is defined as a wax having a hardness between 5 and 15 dmm at 25°C, and wherein a high-melting wax is defined as a wax with a melting point between 60 and 100°C, preferably between 70 and 90°C.

2. Method according to claim 1 [or], wherein the wick wax comprises the following components:

- a flexible wax, in an amount between 20-60 m%;
- a hard wax, in an amount between 10-50 m%; and
- a high-melting wax, in an amount between 0.1-30 m%.

3. Method according to claim 2, wherein the molten wick wax is formed in the wax bath by melting the flexible wax, the hard wax and the high-melting wax together to 5°C above the melting point of the high-melting wax and mixing the molten waxes.

4. Method according to any of the preceding claims, wherein the method further comprises the step of:
iv. removing excess wick wax on the wick by passing the wick through a die, opposing rollers or blades to remove the excess molten wick wax before the wax hardens.

5. Method according to any of the preceding claims, wherein the method further comprises the step of:
v. cooling the wick and winding the wick onto a roll.

6. Method according to any of the preceding claims, wherein step (ii), step (iii), and optionally (iv) are repeated, preferably repeated between one and five times.

7. Method according to any of the preceding claims, wherein the wick is a woven or braided wick.

8. Method according to any of the preceding claims, wherein the flexible wax is further defined as a wax which is flexible enough not to be damaged at a 90° bend.

9. Method according to any of the preceding claims, wherein the flexible wax has a melting point between 55 and 76°C.

10. Method according to any of the preceding claims, wherein the hard wax has a melting point between 60 and 70°C.

11. An improved wick, **characterized in that** the wick is coated with a wick wax, wherein the wick wax comprises a combination of a flexible wax, a hard wax, and a high-melting wax, wherein a flexible wax is defined as a wax having a hardness between 15 and 25 dmm at 25°C, wherein a hard wax is defined as a wax having a hardness between 5 and 15 dmm at 25°C, and wherein a high-melting wax is defined as a wax with a melting point between 60 and 100°C, preferably between 70 and 90°C.

12. Improved wick according to claim 11, wherein the wick wax comprises the following components:

- a flexible wax, in an amount between 20-60 m%;
- a hard wax, in an amount between 10-50 m%; and
- a high-melting wax, in an amount between 0.1-30 m%.

13. Improved wick according to claims 11 or 12, obtained according to a method according to any of claims 1-10.

14. A use of an improved wick according to claim 11 or 12 in the production of candles, **characterized in that** the wick maintains a desired wick position during the production of a candle, and in particular during the hammering of the wick into a wick holder and during the pouring of the candle.

15. A candle comprising an improved wick according to claim 11, 12 or 13 and a meltable wax mass.

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EUROPEAN SEARCH REPORT

Application Number
EP 23 17 4561

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X,D	US 2 745 271 A (WALKER DONALD C) 15 May 1956 (1956-05-15) * column 2, line 44 - line 57; claims; figure *	1-15	INV. C11C5/00
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C11C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	18 September 2023	Saettel, Damien

CATEGORY OF CITED DOCUMENTS

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