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(54) CANDLE WAX COMPOSITION AND METHOD OF MAKING CANDLE

(57) The current invention relates to a candle wax composition wherein 0.1% to 1.5% by weight (wt/wt) of a polymer additive, 0.1% to 1% by weight (wt/wt) of a UV stabilizer, 2% to 10% by weight (wt/wt) of a fragrance composition, 0% to 1.5% by weight (wt/wt) of a pigment composition, and wax up to 100% by weight (wt/wt) are included. The polymer additive has a viscosity at 100°C of between 200 and 400 cps measured by ASTM D3236, and a penetration at 25°C of between 3 and 7 dmm measured by ASTM D1321. The UV stabilizer has a density at 20°C of 0.8 to 1.2 g/cm3. The invention also relates to a method of producing a candle wherein the method comprises obtaining a candle wax composition by mixing the aforementioned components at a temperature between 60°C and 70°C, positioning at least one candle wick in a candle glass jar and pouring the candle wax composition inside said glass jar. The wick is glued to a bottom portion of the candle jar using silicone and is anchored to an upper portion of said jar using a wick-holding device.

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Description

FIELD OF THE INVENTION

[0001] The field of the invention pertains to the design and composition of candles. More specifically, it relates to a novel candle wax composition and method of manufacturing candles using this composition. The composition includes specific proportions of a polymer additive, a UV stabilizer, a fragrance composition, a pigment composition, and wax. The polymer additive and UV stabilizer have defined properties such as viscosity, penetration, density, specific gravity, relative density, flash point and vapor pressure. The invention also includes a specific method of producing a candle using this composition, including the steps of mixing the components at a certain temperature, positioning a wick in a candle jar and pouring the wax composition into the jar.

BACKGROUND

[0002] Candles are widely used for a variety of purposes such as illumination, aromatherapy, decoration, and religious ceremonies. The quality and performance of a candle depend largely on its composition, particularly the composition of the wax and the additives used. The primary component of a candle is typically a type of wax, such as paraffin wax or slack wax. However, pure wax has certain limitations. For instance, it can be prone to deformation or melting under heat, it may not effectively retain and release fragrance, and it may not provide the desired opacity or aesthetic appeal. Moreover, wax is generally susceptible to degradation under exposure to ultraviolet (UV) radiation, which can lead to discoloration and other undesirable changes in the candle. To address these issues, various additives are commonly incorporated into the wax. These may include polymer additives to improve the physical properties of the wax, UV stabilizers to protect against UV-induced degradation, fragrances to provide a pleasant aroma, and pigments to alter the color of the candle. However, the selection and incorporation of these additives is not straightforward. The additive must be compatible with the wax and must not adversely affect the performance of the candle. Furthermore, the additive must be incorporated in an appropriate amount to achieve the desired effect without causing other problems. The type of additives is crucial for defining the intensity and the persistence of the scent of the candles during and after burning.

[0003] Candles compositions are known from US2004/068920, US2002/139041 WO2011/116835, WO2016/154259 and WO03/057810. However, none of these disclosures relate to the importance of the density of the UV stabilizer for improving the candle's scent intensity and persistence.

[0004] Therefore, there is a need for improved candle compositions and methods of producing candles that address these challenges.

SUMMARY OF THE INVENTION

[0005] The invention pertains to a candle wax composition and a method of producing a candle using this composition. The candle wax composition comprises a polymer additive, a UV stabilizer, a fragrance composition, a pigment composition, and wax. The polymer additive, is present in the composition in a proportion of 0.1% to 1.5% by weight and has specified viscosity and penetration properties. The UV stabilizer, present in a proportion of 0.1% to 1% by weight, enhances the candle's resistance to UV-induced degradation. The fragrance composition, present in a proportion of 2% to 10% by weight, provides a pleasant scent when the candle is burned. The pigment composition, present in a proportion of 0% to 1.5% by weight, allows for customization of the candle's color. The wax forms the rest of the composition and is selected from paraffin wax or slack wax. The method of producing a candle involves mixing the candle wax composition at a temperature between 60°C and 70°C, positioning at least one candle wick in a candle glass jar, and pouring the candle wax composition inside the jar. The produced candle comprises a jar, at least one wick, and the wax composition. The invention provides numerous benefits, including enhanced UV resistance, improved candle structure, a favorable olfactory experience, customization of visual appearance, enhanced thermal stability, reduced fire hazards, streamlined manufacturing process, and a high-quality product with uniform characteristics.

DETAILED DESCRIPTION OF THE INVENTION

[0006] Unless otherwise defined, all terms used in disclosing the invention, including technical and scientific terms, have the meaning as commonly understood by one of ordinary skill in the art to which this invention belongs. By means of further guidance, term definitions are included to better appreciate the teaching of the present invention.

[0007] As used herein, the following terms have the following meanings:

"A", "an", and "the" as used herein refers to both singular and plural referents unless the context clearly dictates otherwise. By way of example, "a compartment" refers to one or more than one compartment.

[0008] "About" as used herein referring to a measurable value such as a parameter, an amount, a temporal duration, and the like, is meant to encompass variations of +/-20% or less, preferably +/-10% or less, more preferably +/-5% or less, even more preferably +/-1% or less, and still more preferably +/-0.1% or less of and from the specified value, in so far such variations are appropriate to perform in the disclosed invention. However, it is to be understood that the value to which the modifier "about" refers is itself also specifically disclosed.

[0009] "Comprise", "comprising", and "comprises" and "comprised of" as used herein are synonymous with

"include", "including", "includes" or "contain", "containing", "contains" and are inclusive or open-ended terms that specifies the presence of what follows e.g. component and do not exclude or preclude the presence of additional, non-recited components, features, element, members, steps, known in the art or disclosed therein.

[0010] The term 'wick' as used in this invention pertains to any fibrous material, typically cotton, hemp or linen, that is capable of drawing wax upwards due to capillary action, facilitating its vaporization and subsequent combustion.

[0011] Furthermore, the terms first, second, third and the like in the description and in the claims, are used for distinguishing between similar elements and not necessarily for describing a sequential or chronological order, unless specified. It is to be understood that the terms so used are interchangeable under appropriate circumstances and that the embodiments of the invention described herein are capable of operation in other sequences than described or illustrated herein.

[0012] The recitation of numerical ranges by endpoints includes all numbers and fractions subsumed within that range, as well as the recited endpoints.

[0013] The expression "% by weight", "weight percent", "%wt" or "wt%", here and throughout the description unless otherwise defined, refers to the relative weight of the respective component based on the overall weight of the formulation.

[0014] Whereas the terms "one or more" or "at least one", such as one or more or at least one member(s) of a group of members, is clear *per se,* by means of further exemplification, the term encompasses *inter alia* a reference to any one of said members, or to any two or more of said members, such as, *e.g.*, any ≥3, ≥4, ≥5, ≥6 or ≥7 etc. of said members, and up to all said members.

[0015] Unless otherwise defined, all terms used in disclosing the invention, including technical and scientific terms, have the meaning as commonly understood by one of ordinary skill in the art to which this invention belongs. By means of further guidance, definitions for the terms used in the description are included to better appreciate the teaching of the present invention. The terms or definitions used herein are provided solely to aid in the understanding of the invention.

[0016] Reference throughout this specification to "one embodiment" or "an embodiment" means that a particular feature, structure or characteristic described in connection with the embodiment is included in at least one embodiment of the present invention. Thus, appearances of the phrases "in one embodiment" or "in an embodiment" in various places throughout this specification are not necessarily all referring to the same embodiment, but may. Furthermore, the particular features, structures or characteristics may be combined in any suitable manner, as would be apparent to a person skilled in the art from this disclosure, in one or more embodiments. Furthermore, while some embodiments described herein include some but not other features included in other embodiments, combinations of features of different embodiments are meant to be within the scope of the invention, and form different embodiments, as would be understood by those in the art. For example, in the following claims, any of the claimed embodiments can be used in any combination.

1. Candle wax composition

[0017] In a first aspect, the invention relates to a candle wax composition comprising 0.1% to 1.5% by weight (wt/wt) of a polymer additive, 0.1% to 1% by weight (wt/wt) of a UV stabilizer, 2% to 10% by weight (wt/wt) of a fragrance composition, 0% to 1.5% by weight (wt/wt) of a pigment composition, and wax up to 100% by weight (wt/wt), wherein the polymer additive has a viscosity at 100°C of between 200 and 400 cps measured by ASTM D3236, and a penetration at 25°C of between 3 and 7 dmm measured by ASTM D1321 and wherein the UV stabilizer has a density at 20°C of 0.8 to 1.2 g/cm3, preferably 0.8 to 1 g/cm3 measured by ASTM D792.

Polymer additive

[0018] In some embodiments, of the candle wax composition as disclosed herein, said candle wax compositionn comprises 0.1% to 1.5% by weight (wt/wt) of a polymer additive. The polymer additive is characterized by a viscosity at 100°C of between 200 and 400 cps, as measured by ASTM D3236, and a penetration at 25°C of between 3 and 7 dmm, as measured by ASTM D1321. The inclusion of this polymer additive in the candle wax composition contributes to the candle's improved thermal stability and structural integrity, as it ensures the candle maintains its shape better, even during melting. This results in a reduction in deformity under heat, thereby enhancing the perceived quality and aesthetic appeal of the candle.

[0019] In some embodiments, the polymer additive is present in the wax composition in a proportion of 0.1% to 0.2% by weight (wt/wt), 0.1% to 0.3% by weight (wt/wt), 0.1% to 0.4% by weight (wt/wt), 0.1% to 0.5% by weight (wt/wt), 0.1% to 0.6% by weight (wt/wt), 0.1% to 0.7% by weight (wt/wt), 0.1% to 0.8% by weight (wt/wt), 0.1% to 0.9% by weight (wt/wt), 0.1% to 1.0% by weight (wt/wt), 0.1% to 1.1% by weight (wt/wt), 0.1% to 1.2% by weight (wt/wt), 0.1% to 1.3% by weight (wt/wt), or 0.1% to 1.4% by weight (wt/wt), and all ranges and subranges therebetween. Alternatively, the polymer additive is present in the wax composition in a proportion of 0.2% to 1.5% by weight (wt/wt), 0.3% to 1.5% by weight (wt/wt), 0.4% to 1.5% by weight (wt/wt), 0.5% to 1.5% by weight (wt/wt), 0.6% to 1.5% by weight (wt/wt), 0.7% to 1.5% by weight (wt/wt), 0.8% to 1.5% by weight (wt/wt), 0.9% to 1.5% by weight (wt/wt), 1.0% to 1.5% by weight (wt/wt), 1.1% to 1.5% by weight (wt/wt), 1.2% to 1.5% by weight (wt/wt), 1.3% to 1.5% by weight (wt/wt), or 1.4% to 1.5% by weight (wt/wt) and all ranges and subranges therebetween. In

yet another embodiment, the polymer additive is present in the wax composition in a proportion of 0.1% to 1.5% by weight (wt/wt), 0.2% to 1.4% by weight (wt/wt), 0.3% to 1.3% by weight (wt/wt), 0.4% to 1.2% by weight (wt/wt), 0.5% to 1.1% by weight (wt/wt), 0.6% to 1.0% by weight (wt/wt), or 0.7% to 0.9% by weight (wt/wt), and all ranges and subranges therebetween. In a more preferred embodiment, the polymer additive is present in the wax composition in a proportion of 0.2% to 0.5% by weight (wt/wt). This specific range of proportion has been found to yield optimal results in terms of the overall quality and performance of the candle.

[0020] The suitable quantity of polymer additive in the composition streamlines the candle manufacturing process. It provides a consistent texture to the wax, which facilitates the moulding and shaping processes. This consistency in the wax composition also ensures a uniform product output, thereby increasing the efficiency of the manufacturing process. Furthermore, the specific proportion of the polymer additive helps to preserve intricate design elements in specialty candles. This is particularly beneficial for candles that are designed with elaborate patterns or shapes, as the polymer additive helps to retain these details during the manufacturing process.

[0021] In addition, the polymer additive in the specified range enhances the opacity of the candle. This results in a candle that has a more solid and visually appealing appearance. The polymer additive also contributes to the gloss of the candle, giving it a shiny and attractive finish. This is particularly beneficial for decorative candles, as it enhances their aesthetic appeal.

[0022] The polymer additive also improves the heat resistance of the candle. This means that the candle is able to withstand higher temperatures without melting or deforming, which extends its burn time and improves its performance. The polymer additive also increases the oil binding characteristics of the candle. This results in a candle that burns more evenly and produces a steady flame.

[0023] Furthermore, the polymer additive improves the dispersion of colorants in the candle. This leads to a more uniform color distribution throughout the candle, enhancing its visual appeal. The polymer additive also increases the oil binding characteristics of the candle, which improves the release of fragrance when the candle is burned.

[0024] In a preferred embodiment of the candle wax composition, the polymer additive exhibits a specific gravity measured at 25°C by ASTM D792 that lies within the range of 0.8 and 0.95, 0.85 and 0.9, or preferably 0.89. In some embodiments, the polymer additive exhibits a specific gravity measured at 25°C by ASTM D792 of 0.8 to 0.90, 0.8 to 0.85, 0.85 to 0.95, 0.9 to 0.95, 0.85 to 0.89 or 0.89 to 0.95, and all ranges and subranges therebetween. The polymer additive's specific gravity at this range contributes to the unique weight and feel of the candle, enhancing the overall user's sensory experience when handling the product. This particular range of specific gravity contributes to a perceived sense of quality and luxury due to the weight of the candle. Furthermore, the specific gravity of the polymer additive can also affect the stability of the candle, its burning characteristics, and its overall performance.

[0025] The specific gravity of the polymer additive is carefully controlled during the manufacture of the candle wax composition to ensure that it falls within the desired range. This can be achieved by selecting a suitable polymer additive and controlling the conditions under which the candle wax composition is prepared.

[0026] In a preferred embodiment of the invention, the candle wax composition includes a polymer additive with a relative density at 15.6°C of between 0.9 and 0.95, as measured by ASTM D792. This specification in the relative density of the polymer additive is highly advantageous, as it ensures a consistent performance of the candle under typical burning conditions. The burning pattern of the candle is therefore more predictable and reliable, thereby enhancing the user experience.

[0027] The polymer additive with the specified relative density is introduced into the wax composition in a manner that allows for a precise control of its distribution. This ensures that the integrity of the candle and its performance characteristics are maintained during the burning process. The polymer additive with the specified relative density also contributes to the overall aesthetic appeal of the candle, as it helps to achieve a uniform appearance and color distribution and to the structural integrity of the candle. It helps to maintain the shape and form of the candle during the burning process, thereby reducing the likelihood of deformations and ensuring a consistent burning pattern. This is particularly beneficial for candles that are designed with intricate shapes and details, as it allows for the preservation of these design elements throughout the burning process.

[0028] This range is not restrictive, but rather indicative of the optimal performance characteristics of the candle. More preferably, the relative density of the polymer additive is between 0.91 and 0.94, and most preferably, the relative density is between 0.94 and 0.93. These more specific ranges provide further guidance for achieving optimal burning characteristics and user experience.

[0029] The polymer additive also improves the dispersion of the fragrance throughout the candle, leading to a more uniform, steady and longer-lasting fragrance release during burning. This results in an improved overall user experience, making the candle not just a source of light, but also a means of scenting the environment in a controlled and pleasing manner.

UV stabilizer

[0030] The candle wax composition further comprises 0.1% to 1% by weight (wt/wt) of a UV stabilizer. The UV stabilizer is characterized by a density at 20°C of 0.8 to 1.2 g/cm^3 measured by ASTM D792. The inclusion of this

UV stabilizer in the wax composition enhances the candle's resistance to the deteriorating effects of ultraviolet radiation. This is particularly advantageous in instances where the candle is exposed to sunlight or other UV light sources frequently, as it increases the longevity of the candle. In some embodiments, of the composition as disclosed herein, the UV stabilizer is present in said composition in a proportion of 0.1% to 0.9% by weight (wt/wt), 0.1% to 0.8% by weight (wt/wt), 0.1% to 0.7% by weight (wt/wt), 0.1% to 0.6% by weight (wt/wt), 0.1% to 0.5% by weight (wt/wt), 0.1% to 0.4% by weight (wt/wt), 0.1% to 0.3% by weight (wt/wt), or 0.1% to 0.2% by weight (wt/wt), and all ranges and subranges therebetween. Alternatively, the UV stabilizer is present in said composition in a proportion of 0.2% to 1% by weight (wt/wt), 0.3% to 1% by weight (wt/wt), 0.4% to 1% by weight (wt/wt), 0.5% to 1% by weight (wt/wt), 0.6% to 1% by weight (wt/wt), 0.7% to 1% by weight (wt/wt), 0.8% to 1% by weight (wt/wt),or 0.9% to 1% by weight (wt/wt), and all ranges and subranges therebetween. In yet another alternative embodiment, the UV stabilizer is present in said composition in a proportion of 0.2% to 0.9% by weight (wt/wt), 0.3% to 0.8% by weight (wt/wt), 0.4% to 0.7% by weight (wt/wt), or 0.5% to 0.6% by weight (wt/wt), and all ranges and subranges therebetween.

[0031] In embodiments of the wax composition, the UV stabilizer is characterized by a density at 20°C of 0.8 to 1 g/cm3, 0.8 to 0.9 g/cm^3, or 0.9 to 1 g/cm^3 measured by ASTM D792. It was surprisingly observed that wax compositions that comprise UV stabilizers having a density between 0.8 and 1 g/cm3 exhibit a more intense and persistent scent. Such a UV stabilizer ensures that the scent persists for hours after the candle has burned and that the scent profile remains stable over time without developing off-notes.

[0032] In a preferred embodiment of the invention, the candle wax composition includes a UV stabilizer with a flash point of over 150°C, as determined using the Abel-Pensky method. This particular characteristic of the UV stabilizer significantly enhances the safety profile of the candle composition. The high flash point of the UV stabilizer reduces the likelihood of spontaneous ignition under normal conditions, thus mitigating potential fire hazards and promoting overall user safety.

[0033] The UV stabilizer's high flash point, coupled with its optimal concentration in the candle wax composition, contributes to the safety and stability of the candle while not compromising its aesthetic and sensory properties.

[0034] In a preferred embodiment of the invention, the candle wax composition comprises a UV stabilizer characterized by a vapor pressure measured at 50°C of less than 10 hPa, less than 8 hPa, or less than 5 hPa, as measured by ASTM D2879. This particular property of the UV stabilizer ensures that it remains stable under heat, a condition that is common when a candle is in use. The low vapor pressure of the UV stabilizer means that it is less likely to evaporate or degrade even when the candle is lit and the temperature of the candle composition increases. The UV protective function is preserved for extended time periods, regardless of the candle's exposure to UV radiation. This is especially beneficial for candles that are intended for use in outdoor settings or places where UV radiation exposure is high. The UV stabilizer helps to maintain the aesthetic appeal of the candle, even with prolonged use, by reducing the rate of the candle's degradation due to UV exposure.

[0035] It should be understood that the specific values of vapor pressure mentioned herein are representative and not restrictive. This allows for flexibility in the selection of the UV stabilizer, while still ensuring that the chosen UV stabilizer provides the desired UV protective function for the candle composition.

Fragrance composition

[0036] In a preferred embodiment, the candle wax composition also comprises 2% to 10% by weight (wt/wt) of a fragrance composition. In an embodiment, the candle wax composition includes a fragrance composition present in the wax composition in a proportion of 3% to 9% by weight (wt/wt), of 4% to 8% by weight (wt/wt), or of 5% to of 6% by weight (wt/wt), and all ranges and subranges therebetween. In other embodiments, the candle wax composition includes a fragrance composition present in the wax composition in a proportion of 2% to 9% by weight (wt/wt), of 2% to 8% by weight (wt/wt), of 2% to 7% by weight (wt/wt), of 2% to 6% by weight (wt/wt), of 2% to 5% by weight (wt/wt), of 2% to 4% by weight (wt/wt),or of 2% to 3% by weight (wt/wt), and all ranges and subranges therebetween. In another embodiment, the candle wax composition includes a fragrance composition present in the wax composition in a proportion of 3% to 10% by weight (wt/wt), of 4% to 10% by weight (wt/wt), of 5% to 10% by weight (wt/wt), of 6% to 10% by weight (wt/wt), of 7% to 10% by weight (wt/wt), of 8% to 10% by weight (wt/wt), or of 9% to 10% by weight (wt/wt), and all ranges and subranges therebetween. In a preferred embodiment, the fragrance composition is present in the wax composition in a proportion of 4% to 9% by weight (wt/wt).

[0037] The carefully formulated percentage of the fragrance composition ensures that the fragrance from the candle is released slowly over time, extending the duration of the pleasant scent after the candle is lit.

[0038] This specific range of fragrance composition provides an optimal balance of fragrance intensity. It ensures that the scent is not only noticeable and appreciated by consumers but also that it is not overpowering. This delicate balance enhances the overall ambience and contributes to a pleasing sensory experience for the user. The fragrance composition is not limited to any particular type of fragrance, and can include a variety of scents, from floral to woody, citrus to spicy, or any combination thereof.

Pigment composition

[0039] The candle wax composition may further comprise 0% to 1.5% by weight (wt/wt) of a pigment composition, allowing for customization of the visual appearance of the candle. This enhances the user experience by giving them the freedom to choose the color of the candle, making it more personal and adaptable to the decor of their surroundings.

[0040] The pigment composition, if included, is present in the wax composition in a proportion of 0% to 1.5% by weight (wt/wt), more preferably in a proportion of 0.02% to 1% by weight (wt/wt), and most preferably in a proportion of 0.5% by weight (wt/wt), and all ranges and subranges therebetween.

Wax

[0041] Finally, the candle wax composition comprises wax up to 100% by weight (wt/wt). In a preferred embodiment, the wax is selected from paraffin wax or slack wax. In a more preferred embodiment, the wax is present in the wax composition in a proportion of 86% to 97.8% by weight (wt/wt). In terms of the proportions of the wax in the candle composition, in a more preferred embodiment, the wax is present in the composition in a proportion of between 86% and 97.8% by weight (wt/wt). More preferably, the wax is present in a proportion of 86% to 97% by weight (wt/wt), 86% to 96% by weight (wt/wt), 86% to 95% by weight (wt/wt), 86% to 94% by weight (wt/wt), 86% to 93% by weight (wt/wt), 86% to 92% by weight (wt/wt), 86% to 91% by weight (wt/wt), 86% to 90% by weight (wt/wt), 86% to 89% by weight (wt/wt), 86% to 88% by weight (wt/wt), or 86% to 87% by weight (wt/wt), and all ranges and subranges therebetween. In an alternative embodiment, the wax is present in a proportion of 86% to 97.8% by weight (wt/wt), 87% to 97.8% by weight (wt/wt), 88% to 97.8% by weight (wt/wt), 89% to 97.8% by weight (wt/wt), 90% to 97.8% by weight (wt/wt), 91% to 97.8% by weight (wt/wt), 92% to 97.8% by weight (wt/wt), 93% to 97.8% by weight (wt/wt), 94% to 97.8% by weight (wt/wt), 95% to 97.8% by weight (wt/wt), or 96% to 97.8% by weight (wt/wt), and all ranges and subranges therebetween. In yet another alternative embodiment, the wax is present in a proportion of 87% to 97% by weight (wt/wt), of 88% to 96% by weight (wt/wt), of 89% to 95% by weight (wt/wt), of 90% to 94% by weight (wt/wt), or of 91% to 93% by weight (wt/wt), and all ranges and subranges therebetween.

[0042] This proportion of wax in the composition is crucial for the optimal functioning of the candle. The wax serves as the primary fuel source for the burning process, and its quantity significantly impacts the burn time of the candle. When the wax content falls within this preferred range, the candle is found to burn slowly and uniformly. This slow, steady burn prolongs the life of the candle, providing a longer duration of illumination from a single candle. This is particularly advantageous in situations where sustained light is required over an extended period.

[0043] Furthermore, the controlled burn rate also contributes to the steady release of the fragrance embedded in the candle. As the wax slowly melts and vaporizes, it carries the fragrance molecules into the surrounding atmosphere. The consistent burn rate ensures that the fragrance is released at a steady pace, providing a uniform and continuous scent experience throughout the life of the candle. This is in contrast to candles with lower wax content, which may burn too quickly and release the fragrance in a burst, leading to a diminished scent experience over time.

[0044] In an embodiment, the wax has an oil content of between 0.1% and 0.9% by weight (wt/wt). More preferably, the wax has an oil content of between 0.2% and 0.8% by weight (wt/wt), and most preferably, the wax has an oil content of between 0.3% and 0.7% by weight (wt/wt). The oil content of the wax contributes to the burning properties of the candle, with a higher oil content typically resulting in a longer burning time.. It allows for a steady and cleaner burn with less soot, thereby reducing any potential fire hazards while extending the burn time of the candle. This is particularly advantageous for users who desire long-lasting candles for various purposes such as mood lighting, aromatherapy, or decorative purposes.

[0045] The paraffin wax or slack wax in the candle composition plays a crucial role in determining the overall quality and performance of the candle. They are known for their excellent burning properties and the ability to blend well with other components of the candle composition, such as the polymer additive and UV stabilizer. The use of paraffin wax or slack wax in the candle composition contributes to the creation of a candle that not only burns effectively but also maintains its structure during the burning process.

[0046] In this preferred embodiment, the unique combination of the high flash point UV stabilizer, the polymer additive, the fragrance composition, the pigment composition, and the wax, results in a candle wax composition that not only enhances the user experience in terms of aesthetics and fragrance but also ensures a safe and predictable burning behavior.

[0047] In summary, the selection of paraffin wax or slack wax in the candle wax composition, along with the inclusion of a polymer additive, contributes to the creation of a high-quality, candle that offers enhanced heat resistance and potentially longer burning time.

[0048] It should be noted that while the invention has been described in detail with reference to specific embodiments, the description is illustrative of the invention and is not to be construed as limiting the invention. Various modifications and applications may occur to those skilled in the art without departing from the true spirit and scope of the invention as defined by the appended claims.

2. Methods

[0049] In a second aspect, the current invention relates to a method of making a candle, wherein the method comprises obtaining a candle wax composition by mixing 0.1% to 1.5% by weight (wt/wt) of a polymer additive, 0.1% to 1% by weight (wt/wt) of a UV stabilizer, 2% to 10% by weight (wt/wt) of a fragrance composition, 0% to 1.5% by weight (wt/wt) of a pigment composition, and wax up to 100% by weight (wt/wt), at a temperature between 60°C and 70°C, wherein the polymer additive has a viscosity at 100°C of between 200 and 400 cps measured by ASTM D3236, and a penetration at 25°C of between 3 and 7 dmm measured by ASTM D1321 and wherein the UV stabilizer has a density at 20°C of 0.8 to 1.2 g/cm^3

[0050] The candle wax composition is mixed at a temperature range of between 50°C and 70°C. This specific temperature range is critical in preserving the quality and enhancing the dispersion of sensitive additives within the candle wax composition. The careful temperature control ensures that the sensitive additives, such as the fragrance composition, the UV stabilizer, and the polymer additive, are not adversely affected by excessive heat. This leads to an overall improvement in the quality and performance of the candle.

[0051] In this embodiment, the temperature range of 60°C to 70°C is more preferable, as it provides an optimal environment for the effective blending of the wax composition. However, in some embodiments, the temperature may be slightly lower or higher than this range. For instance, in some embodiments, the temperature may be between 55°C and 75°C, more preferably between 58°C and 72°C, and most preferably between 60°C and 70°C. These variations in temperature still allow for the effective mixing of the wax composition, while also accommodating for slight variations in the specific composition of the wax and the environmental conditions during the mixing process.

[0052] In further embodiments, the temperature may be controlled to within a few degrees of the desired temperature. For example, in some embodiments, the temperature may be controlled to within $\pm$2°C, more preferably within $\pm$1°C, and most preferably within $\pm$0.5°C of the desired temperature. This precise temperature control ensures that the wax composition is mixed at the optimal temperature for preserving the quality and enhancing the dispersion of the sensitive additives.

[0053] The method of controlling the temperature during the mixing process may vary depending on the specific requirements of the wax composition and the equipment used. In some embodiments, the temperature may be controlled using a thermostat or a similar temperature control device. In other embodiments, the temperature may be controlled using a heat source and a temperature sensor. The heat source may be adjusted based on the temperature readings from the sensor to maintain the desired temperature during the mixing process.

[0054] In a preferred embodiment, the method of producing a candle involves obtaining a candle wax composition by mixing specific proportions of a polymer additive, a UV stabilizer, a fragrance composition, a pigment composition, and wax as disclosed in any of the previous embodiments. More specifically, the polymer additive is present in a proportion of 0.1% to 1.5% by weight (wt/wt), the UV stabilizer is present in a proportion of 0.1% to 1% by weight (wt/wt), the fragrance composition is present in a proportion of 2% to 10% by weight (wt/wt), the pigment composition is present in a proportion of 0% to 1.5% by weight (wt/wt), and the wax makes up the remaining proportion up to 100% by weight (wt/wt).

[0055] In a more preferred embodiment, the polymer additive has a viscosity at 100°C of between 200 and 400 cps, as measured by ASTM D3236, and a penetration at 25°C of between 3 and 7 dmm, as measured by ASTM D1321. The UV stabilizer has a density at 20°C of 0.8 to 1.2 g/cm3. These specific properties of the polymer additive and the UV stabilizer contribute to the overall quality and performance of the candle wax composition.

[0056] In a most preferred embodiment, the polymer additive is either Vybar® or Polyboost®. The inclusion of these polymer additives in the candle wax composition improves the heat resistance of the candle, potentially extending its burning time. This is due to the fact that Vybar® and Polyboost® are known to enhance the heat resistance of the composition, which could potentially slow down the rate of melting and combustion. This results in the candle remaining lit for a longer period of time, providing both economic and aesthetic benefits.

[0057] Moreover, in another preferred embodiment, the UV stabilizer is selected from a group consisting of Hindered Amine Light Stabilizers (HALS), Benzotriazoles, Tin Compounds, Phenolic Antioxidants, and UV Absorbers. Each of these UV stabilizers has its own unique properties that contribute to the UV protection of the candle material, thus preventing the degradation of the candle due to UV exposure.

[0058] The candle wax composition used in this embodiment contains a polymer additive, a UV stabilizer, a fragrance composition, and optionally a pigment composition. The polymer additive and UV stabilizer provide enhanced performance and protection for the candle, while the fragrance and pigment compositions contribute to the sensory appeal of the candle.

[0059] In some embodiments, the polymer additive is present in the wax composition in a proportion of 0. between 0.2% and 1% by weight (wt/wt), erably at 0.5% by weight (wt/wt). The UV stabilizer is present in a proportion of 0.1% to 1% by weight (wt/wt), more preferably between 0.2% and 0.8% by weight (wt/wt), and most preferably at 0.5% by weight (wt/wt). The fragrance composition is present in the wax composition in a proportion of 2% to 10% by weight (wt/wt), more preferably between 3% and 9% by weight (wt/wt), and most preferably at 6% by weight (wt/wt). The pigment composition, when used, is present in a proportion of 0%

to 1.5% by weight (wt/wt), more preferably between 0.02% and 1% by weight (wt/wt), and most preferably at 0.5% by weight (wt/wt). The remainder of the wax composition is made up of wax, which in a preferred embodiment is present in a proportion of 86% to 97.8% by weight (wt/wt), more preferably between 88% and 96% by weight (wt/wt), and most preferably at 92% by weight (wt/wt).

[0060] In an embodiment of the method, as disclosed herein, the wax is either paraffin wax or slack wax. The choice of wax can greatly influence the overall properties of the candle, including its hardness, melting point, and burning time. The use of paraffin wax or slack wax in the candle wax composition ensures a high-quality product with desirable properties.

[0061] In a preferred embodiment of the present invention, the method further comprises positioning of at least one candle wick in a candle glass jar and pouring the candle wax composition inside said glass jar.

[0062] In a preferred embodiment, the candle wick is positioned in the center of the glass jar. This central positioning ensures an even burn across the entire surface of the candle wax, reducing the likelihood of tunneling and allowing for a more complete utilization of the wax. In some embodiments, the candle may contain multiple wicks. These wicks may be evenly spaced within the glass jar to further promote an even burn and increase the light output. The number of wicks can vary, such as but not limited to between 1 and 7 wicks, between 2 and 6 wicks, between 3 and 5 wicks or between 4 and 5 wicks, or a single wick.

[0063] In a preferred embodiment of the invention, the method of producing a candle includes a step wherein at least one wick is affixed to the bottom portion of a candle jar using silicone. This process of adhering the wick to the base of the jar provides a solid foundation and ensures that the wick remains in a steady position throughout the life of the candle. The silicone adhesive is selected for its high temperature resistance and strong bonding capabilities, providing a secure attachment that can withstand the heat generated by the burning wick. In this embodiment, the silicone adhesive may be applied in a range of thicknesses, with a preferred thickness of between 1 and 3 millimeters, more preferably between 1.5 and 2.5 millimeters, and most preferably around 2 millimeters.

[0064] In the same embodiment, the wick is also anchored to the upper portion of the candle jar using a wick-holding device. This device, which may comprise at least one metal, plastic or wood component, is designed to maintain the wick in an upright position, ensuring a consistent burn and optimizing the burn time of the candle. The wick-holding device may be designed to accommodate a range of wick diameters, with a preferred diameter of between 1 and 3 millimeters, more preferably between 1.5 and 2.5 millimeters, and most preferably around 2 millimeters. The wick-holding device may also feature an adjustable design, allowing for the accommodation of wicks of various lengths and diameters.

[0065] The dual attachment of the wick, both to the base of the jar using silicone and to the top of the jar using a wick-holding device, ensures a uniform and steady burn. This not only optimizes the burn time of the candle, but also contributes to a safer use of the product. By maintaining the wick in a stable position, the risk of the wick falling over and causing the flame to come into contact with the sides of the jar is significantly reduced. This can help to prevent potential fire hazards and enhance the overall safety of the candle.

[0066] In a preferred embodiment, the wick may be composed of a material that is resistant to high temperatures and has a slow burn rate, such as cotton or hemp. The wick may also be treated with a flame retardant substance to further enhance its safety features. The length and thickness of the wick can be adjusted based on the size and shape of the candle jar, with a preferred length of between 10 and 30 centimeters, more preferably between 15 and 25 centimeters, and most preferably around 20 centimeters.

[0067] The candle wax composition is carefully poured into the glass jar, encapsulating the wick or wicks. After the wax composition cools and solidifies, the wick-holding device is removed.

[0068] In conclusion, the present invention provides a method for producing a candle that optimizes burn time, enhances safety, and improves the overall user experience. The dual attachment of the wick to the candle jar and the use of a wick-holding device contribute to a steady and uniform burn, while the selection of high-quality materials and careful design considerations ensure a safe and enjoyable use of the product.

3. Candle

[0069] In a third aspect, the current invention relates to a candle that comprises a jar, at least one wick, and a wax composition that is in accordance with any of the embodiments previously described. The wax composition of the candle encompasses a myriad of advantageous properties that contribute to the overall value of the invention.

[0070] The wax composition, in particular, has been formulated to provide a texture that is smooth, rich and luxurious to the touch. This is primarily due to the specified properties of the polymer additive, which has a viscosity at 100°C of between 200 and 400 cps as measured by ASTM D3236, and a penetration at 25°C of between 3 and 7 dmm as measured by ASTM D1321. In a more preferred embodiment, the viscosity of the polymer additive is between 250 and 350 cps, and most preferably, it is about 300 cps. Similarly, the penetration of the polymer additive is more preferably between 4 and 6 dmm, and most preferably, it is about 5 dmm.

[0071] The polymer additive, which is present in the wax composition in a proportion of 0.1% to 1.5% by weight (wt/wt), contributes to the dimensional stability and heat resistance of the candle. In a more preferred

embodiment, the polymer additive is present in the wax composition in a proportion of 0.2% to 0.8% by weight (wt/wt), and most preferably, it is about 0.5% by weight (wt/wt).

[0072] The wax composition also includes a UV stabilizer that has a density at 20°C of 0.8 to 1.2 g/cm3. The UV stabilizer, which is present in the wax composition in a proportion of 0.1% to 1% by weight (wt/wt), ensures that the candle is protected from the harmful effects of UV exposure. In a more preferred embodiment, the UV stabilizer is present in the wax composition in a proportion of 0.2% to 0.6% by weight (wt/wt), and most preferably, it is about 0.4% by weight (wt/wt).

[0073] The wax composition further includes a fragrance composition that is present in a proportion of 2% to 10% by weight (wt/wt). This allows the candle to emit a pleasant scent when burned, enhancing the overall user experience. In a more preferred embodiment, the fragrance composition is present in the wax composition in a proportion of 3% to 8% by weight (wt/wt), and most preferably, it is about 6% by weight (wt/wt).

[0074] Lastly, the wax composition may include a pigment composition that is present in a proportion of 0% to 1.5% by weight (wt/wt). This provides the user with the option to customize the visual appearance of their candle, thereby increasing satisfaction and overall user experience. In a more preferred embodiment, the pigment composition is present in the wax composition in a proportion of 0.1% to 1% by weight (wt/wt), and most preferably, it is about 0.5% by weight (wt/wt).

[0075] In a preferred embodiment, the candle comprises between 1 and 7 wicks. This range provides a significant advantage in terms of versatility and customization. Depending on the number of wicks used, users can adjust the intensity of the light and fragrance according to their specific needs or preferences. For instance, a candle with a single wick may provide a soft, subtle light and fragrance, suitable for a quiet, intimate setting. On the other hand, a candle with 7 wicks can offer a brighter light and more intense fragrance, making it ideal for larger spaces or special occasions. This flexibility extends not only to the user's experience but also to the manufacturing process. Manufacturers can create a variety of candle models with different numbers of wicks, thereby expanding their product range and meeting diverse market demands.

[0076] In a more preferred embodiment, the candle comprises between 2 and 5 wicks. This narrowed range still offers a good degree of versatility, while focusing on the most common preferences of users. A candle with 2 to 5 wicks can provide a moderate to bright light and a noticeable yet not overpowering fragrance. This makes it suitable for a wide range of settings, from casual home use to more formal or festive occasions. Moreover, manufacturing candles with 2 to 5 wicks can be a more efficient and cost-effective process, as it targets the most popular product variants.

[0077] In the most preferred embodiment, the candle comprises 3 wicks. This specific number of wicks represents a balance between light intensity, fragrance release, and burn time. A 3-wick candle can provide a bright, warm light and a rich fragrance, enhancing the ambiance of a room. At the same time, it can ensure a longer burn time compared to candles with more wicks, thus offering better value for users. From a manufacturing perspective, producing 3-wick candles can be a streamlined and optimized process, as it focuses on a single, highly popular product variant.

[0078] In all these embodiments, the use of multiple wicks in a candle is not just about varying the light and fragrance intensity. It also contributes to a more even and efficient burning process. When properly positioned, multiple wicks can help distribute the heat evenly across the candle, preventing the formation of a deep, central 'tunnel' and ensuring a full melt pool. This results in less wasted wax and a longer-lasting candle. Moreover, multiple wicks can create a visually appealing, multi-flame effect, adding to the aesthetic value of the candle.

EXAMPLES

[0079] The present invention will now be further exemplified with reference to the following examples. The present invention is in no way limited to the given examples or to the embodiments presented in the figures.

[0080] **Example 1.** A candle wax composition was prepared using 1% Vybar® as the polymer additive, 0.2% Kaiser® as the UV stabilizer, 7% Feu Crepitant as the fragrance composition, and the remainder was made up of Paraffin Wax CSP131C. The composition was mixed at a temperature of 65°C. The resulting candle demonstrated enhanced UV resistance, increased structural integrity, prolonged fragrance release, and improved thermal stability. Furthermore, the candle's aesthetic appeal was customizable due to the inclusion of pigment composition in the wax mixture.

[0081] **Example 2.** A candle wax composition was prepared using 1% Polyboost® 165 as the polymer additive, 0.5% Kaiser® as the UV stabilizer, 5% Zanzibar Spices as the fragrance composition, 0.14% Bekro Nature® - 6080-22 as the pigment composition, and the remainder was made up of Paraffin Wax CSP131C. The composition was mixed at a temperature of 70°C. The resulting candle exhibited superior candle qualities, improved additive integration, enhanced heat resistance, and extended burning duration.

[0082] **Example 3.** A candle wax composition was prepared using 1% Vybar® as the polymer additive, 0.2% Kaiser as the UV stabilizer, 9% Prince du desert as the fragrance composition, and the remainder was made up of P2 DW OIL Slabs. The composition was mixed at a temperature of 60°C. The resulting candle demonstrated enhanced fragrance integration, improved thermal stability, and extended burning duration.

[0083] **Example 4.** A candle wax composition was prepared using 1% Polyboost®165 as the polymer ad-

ditive, 0.2% Kaiser® as the UV stabilizer, 9% 70's romance G12117008 as the fragrance composition, and the remainder was made up of P2 DW OIL Slabs. The composition was mixed at a temperature of 70°C. The resulting candle exhibited enhanced UV resistance, increased structural integrity, prolonged fragrance release, and improved thermal stability.

[0084] **Example 5.** A candle wax composition was prepared using 1% Vybar® as the polymer additive, 0.2% Kaiser® as the UV stabilizer, 8% Basil Tomato 2 as the fragrance composition, and the remainder was made up of P2 DW OIL Slabs. The composition was mixed at a temperature of 60°C. The resulting candle demonstrated enhanced UV resistance, increased structural integrity, prolonged fragrance release, and improved thermal stability.

Example 6. Scent persistence profile

[0085] Candle composition A was prepared by mixing 1 wt/wt % polymer additive, 0.2% of an UV stabilised with a density at 20°C of 1 g/cm^3 measured by ASTM D792, 9 wt/wt % fragrance and wax up to 100 wt/wt%. Candle composition B was prepared by mixing 1 wt/wt % polymer additive, 0.2% of a UV stabilised with a density at 20°C of 1.36 g/cm^3 measured by ASTM D792, 9 wt/wt % fragrance and wax up to 100 wt/wt%.

[0086] Each composition was used to create a set of candles. The candles were poured into moulds and allowed to cure under controlled conditions (20°C, 50% relative humidity) for a period of 24 hours.

Initial scent intensity

[0087] Candles from each composition were ignited and placed in a sealed test chamber with controlled temperature (22°C) and minimal airflow to prevent scent dispersion outside the chamber.

[0088] The scent intensity was determined at intervals of 15 minutes, 30 minutes, and 60 minutes after lighting using dynamic olfactometry by human panellists.

Scent persistence

[0089] After burning for 1 hour, the candles were extinguished, and scent persistence was measured at intervals of 15 minutes, 30 minutes, and hourly thereafter, up to 3 hours post-extinguishment.

[0090] Scent persistence using dynamic olfactometry by human panellists in the air of the sealed chamber was determined.

[0091] **Results:** The candles made using composition A (UV stabilizer density of 1 g/cm^3) exhibited a higher initial scent intensity than the candles made with composition B.

[0092] The scent profile also lasted longer for the candles made of composition A when compared to candles made of composition B. This demonstrates the importance of UV stabilizer density in enhancing scent performance in candle formulations.

[0093] It is supposed that the present invention is not restricted to any form of realization described previously and that some modifications can be added to the presented example of fabrication without reappraisal of the appended claims. For example, the present invention has been described referring to specific types of wax, polymer additives, UV stabilizers, fragrance compositions, and pigment compositions, but it is clear that the invention can be applied to other types of these components for instance or to different proportions.

[0094] It is clear that the method according to the invention, and its applications, are not limited to the presented examples. The present invention is in no way limited to the embodiments described in the examples and/or shown in the figures. On the contrary, methods according to the present invention may be realized in many different ways without departing from the scope of the invention.

Claims

1. A candle wax composition comprising 0.1% to 1.5% by weight (wt/wt) of a polymer additive, 0.1% to 1% by weight (wt/wt) of a UV stabilizer, 2% to 10% by weight (wt/wt) of a fragrance composition, 0% to 1.5% by weight (wt/wt) of a pigment composition, and wax up to 100% by weight (wt/wt), wherein the polymer additive has a viscosity at 100°C of between 200 and 400 cps measured by ASTM D3236, and a penetration at 25°C of between 3 and 7 dmm measured by ASTM D1321 and wherein the UV stabilizer has a density at 20°C of 0.8 to 1 g/cm^3 measured by ASTM D792.

2. The candle wax composition according to claim 1, wherein the polymer additive is present in said wax composition in a proportion of 0.2 to 0.5% by weight (wt/wt).

3. The candle wax composition according to any of the claims 1 or 2, wherein the fragrance composition is present in said wax composition in a proportion of 4% to 9% by weight (wt/wt).

4. The candle wax composition according to any of the claims 1 to 3, wherein the polymer additive has a specific gravity at 25°C between 0.8 and 0.95, as measured by ASTM D792.

5. The candle wax composition according to any of the claims 1 to 4, wherein the polymer additive has a relative density at 15.6°C, of between 0.9 and 0.95 as measured by ASTM D792.

6. The candle wax composition according to any of the

claims 1 to 5, wherein the UV stabilize has a flash point determined using the Abel-Pensky method of over 150°C.

7. The candle wax composition according to any of the claims 1 to 6, wherein the UV stabilizer has a vapor pressure measured at 50°C of less than 10 hPa, as measured by ASTM D2879.

8. The candle wax composition according to any of the claims 1 to 7, wherein the wax is selected from paraffin wax or slack wax.

9. The candle wax composition according to any of the claims 1 to 8, wherein the wax is present in said wax composition in a proportion of 86% to 97.8% by weight (wt/wt).

10. The candle wax composition according to any of the claims 1 to 9, wherein the wax has an oil content of 0.1% to 0.9% by weight (wt/wt).

11. A method of producing a candle wherein the method comprises obtaining a candle wax composition by mixing 0.1% to 1.5% by weight (wt/wt) of a polymer additive, 0.1% to 1% by weight (wt/wt) of a UV stabilizer, 2% to 10% by weight (wt/wt) of a fragrance composition, 0% to 1.5% by weight (wt/wt) of a pigment composition, and wax up to 100% by weight (wt/wt), at a temperature between 50°C and 70°C, wherein the polymer additive has a viscosity at 100°C of between 200 and 400 cps measured by ASTM D3236, and a penetration at 25°C of between 3 and 7 dmm measured by ASTM D1321 and wherein the UV stabilizer has a density at 20°C of 0.8 to 1.2 g/cm3

12. The method according to claim 11 wherein the method further comprises the positioning of at least one candle wick in a candle glass jar and pouring the candle wax composition inside said glass jar.

13. The method according to claim 12, wherein the at least one wick is affixed to a bottom portion of the candle jar using silicone and is anchored to an upper portion of said jar using a wick-holding device.

14. A candle comprising a jar, at least one wick and a wax composition according to any of the claims 1 to 10.

15. The candle according to claim 11, wherein the candle comprises between 1 and 7 wicks.

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EUROPEAN SEARCH REPORT

Application Number
EP 24 22 3338

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Place of search	Date of completion of the search	Examiner
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