

METHOD OF MAKING A CANDLE AND COMPOSITION THEREOF

The present invention relates to a method of manufacturing candle, which eliminates the shortcomings of existing conventional candle manufacturing methods in which a petrolic chemical material is used for making candles. The present invention employs a mixture of vegetable oil and solidified oil to produce a candle which is burned without releasing smoke and toxic particles and can be burned to release an odour. Therefore, the drawbacks of conventional candle, such as the emittance of black smoke, waste gas and strange smells can be eliminated.

A candle is a widely used illuminating device and has been used as such for many centuries. At present, although many advanced illuminating devices are used, a candle is still popular for use as a decoration or for a special situation such as a holiday.

A conventional candle is made from wax material. However, such candle will emit smoke and bad smells when burning. Many people cannot accept such smells. Also, a small amount of toxic particles will be created when the candle burns. These particles will somewhat affect the health of a human body when inhaled.

Moreover, in India, Nepal, Tibet and other places where Buddhism is practised, vegetable oil is always used to manufacture a candle. However, such vegetable oil is a liquid and is liable to slip from the hand and contaminate the estrade, offering, etc.

Therefore, an improved method for manufacturing a candle which is solid and can be easily carried without dropping and which can be used in a sanitary manner is needed.

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It is a primary object of this invention to provide a candle which can be burned without producing smoke and toxic particles, and which can be burned to release an odour.

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It is a further object of this invention to provide a method for solidifying vegetable oil so that the vegetable oil can be carried easily so as to be used sanitarilly.

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Accordingly, the present invention provides a method of making a candle which includes the steps of heating one or both of a vegetable oil and a solidified oil to melt it, mixing the vegetable oil and solidified oil together, and then allowing the mixture to cool and solidify to provide the wax of the candle, the vegetable oil having a melting point of 35 to 37°C and having a palmitic content no more than 0.1 % and the solidified oil having the following characteristics: Acid Value (A.V.) below 0.5, Iodine Value (I.V.) below 2.0, Saponification Value (S.V) between 195-198, Melting Point (M.P) of 60 ± 1°C, water and impurity content below 0.2 %.

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As used herein, the basis of the composition percentages is weight/volume.

The palmitic content referred to includes palmitic acid and derivatives thereof. The candle mixture may further include emulsifier, citric acid,

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beta-carotene, up to 2% weight/volume of fragrance or a combination thereof.

5 The preferred components of the vegetable oil for use in making a candle are palm oil, coconut oil, soy bean oil, cotton seed oil, palm olein and hydrogenates of palm oil. The preferred combination of these components comprises a mixture of palm oil, coconut oil, soy bean oil and cotton seed oil.

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 The preferred quantities of these components in making the candle are as follows; 50 to 58% weight/volume palm oil, 30-35% weight/volume coconut oil, 5 to 8% weight/volume soy bean oil and 5-8% weight/volume cotton seed oil.

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 In making a candle according to the present invention it is preferred that the solidified oil has a water and impurities content below 0.2% weight/volume. It is also preferred that the solidified oil is a refined mixture derived from a combination of palm oil and soy bean oil. When the solidified oil comprises these two components it is preferred that the palm oil is present at 80 to 90% weight/volume and the soy bean oil is present at 10 to 20% weight/volume.

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 It is preferred that the ratio of vegetable oil to solidified oil is present in the range of from 5:3 to 3:5 with the more preferred ratio being 5:3.

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 In making a candle according to the present invention the vegetable oil may be heated to 50°C before the solidified oil is added or both the vegetable oil and the solidified oil may be melted before mixing. The candle manufacture may also

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include steps selected from purifying, deacidifying, deodorising and decolouring the candle mixture.

Following mixing of the ingredients to prepare a
5 candle the oil mixture may be poured into a mound,
whilst maintained at a temperature in the range of
from 75 to 80°C and whilst the temperature of the
room is maintained in the range of from 18 to
22°C. Before the mixture is allowed to solidify a
10 wick may be placed therein. Additionally, when the
ratio of vegetable oil to solidified oil is in the
ratio of 3:5, the candle may be allowed to solidify
without being poured into a mould.

15 Referring to the drawing, Figure 1 is a plot of
specific volume against temperature.

When manufacturing, in one particular embodiment
the vegetable oil is first made according to the
20 following list:

Vegetable oil details

The components of the oil mixture (one hundred
25 percent pure vegetable oils):

- A. Coconut oil
- B. Palm oil
- C. Palm olein
- 30 D. Hydrogenate of palm oil

Characteristics:

Palmitic content.....0.1% at most
35 Melting point35°C - 37°C
Emulsifierincluded

FlavourVegetable

Additive:

5 Citric acid BHA
BHT β -Carotene

The solidified oil must have the following
specification so as to mix with the vegetable oil and
10 form a solid state of oil by means of technical
temperature and dissolving degree control:

1. A.V. below 0.5
2. I.V. below 2.0
- 15 3. S.V. 195-198
4. M.P. $60^{\circ}\text{C} \pm 1^{\circ}\text{C}$
5. Water and impurity below 0.2%

After the solidified oil is mixed with the
20 vegetable oil with the aforesaid components, they
will solidify to form a candle. Also, it can be
evidenced by the burning state of a candle prepared
in accordance to the present invention that no smoke
will be produced during the burning. This is a great
25 advantage over the prior art. Moreover, a special
vegetable odor is released when burning and no
toxical particles are dispensed.

It has been shown that a candle prepared
30 according to the present invention does not produce
smoke when burning. The vegetable oil, when mixed
with the solidified oil will become solid by means of
technical temperature and dissolving degree control.
The mixture will melt when heated to be absorbed by a
35 wick and will thereafter burn continuously. Moreover
during burning, a special vegetable odour is released

and no toxic particles are produced.

In the present invention, the purer the compounds comprising the candle mixture is, the smaller the change of melting point thereof will be. However, both the natural oil and processed oil will not possess an obvious melting point due to complex compositions and will have a range of melting points. Generally, an oil with large range of melting points can serve as the vegetable oil. In respect of the density of the fat, the density of a solid state fat and that of a liquid state fat are different. When the temperature rises, a part of the solid fat melts and thus the volume of the whole sample will increase in proportion thereto, i.e., the increment of sample volume is in proportion to the ratio of the existing liquid fat. By means of this relationship, the solid-liquid ratio or solid fat index, SFI; solid content index, SCI can be estimated from the volume increment. A dilatometer is often used to measure the solid-liquid ratio. As shown in Figure 1, the dotted line portion is an external insertion of the liquid and solid fat specific volume during temperature variation. The solid line portion is the change of specific volume during temperature variation. When the temperature rises to a certain value, the specific volume is X (specific volume is the reciprocal of the density) and then the possession of solid fat is $A/B \times 100\%$ while the possession of the liquid fat is $(B-A)/B \times 100\%$. Actually, because the variation of the specific volume in solid state is hardly measured, a line parallel to the liquid specific volume variation line is often presumed to be the solid specific volume variation line to facilitate the calculation and simplify the operation.

Through the above formula, the calculation of the mixing of the vegetable oil and solidified oil of this invention can be easily derived. Using the
5 above method, the liquid-solid ratio can be controlled through the temperature variation. Therefore, the manufacturing of candles according to the present invention is very simple.

10 The invention will now be illustrated by the following examples.

Example I

15 A candle was prepared wherein the vegetable oil was added into and mixed with a solidified oil at a ratio in a range of from 5:3 to 3:5. The mixture was then solidified. The vegetable oil blend (a hundred percent pure vegetable oil) had the following
20 composition:

50-58% palm oil, 30-35% coconut oil, 5-8% soy bean oil, 5-8% cotton seed oil, 2% flavour, 0.1% palmitic content, melting point 35°-37°C, added emulsifier, vegetable smell, and additives of citric
25 acid BHA (Butylated Hydroxyanisole) and BHT (Butylated Hydroxytoluene) β -carotene; the solidified oil was made by adding 80-90% palm oil to 10-20% soy bean oil and refining the solidified oil had the following composition;

30 Acid value below 5.0, iodine value below 2.0, saponification value of 195-198, melting point of 60 $\pm$ 1°C and water and impurities below 0.2% weight/volume.

35 The vegetable oil was heated to 50°C, until it was totally melted, and then the solidified oil was

added at a predetermined ratio. The mixture was then heated to 80°C and the temperature was controlled for about twenty minutes with stirring to completely mix the oils. The mixture was then purified, 5 deacidified, deodourised and decoloured by standard techniques.

Example 2

10 A candle was prepared as in Example 1.

The oil blend was poured into a mould with the room temperature controlled in the range of from 18°C-22°C, and the temperature of the poured oil 15 kept within the range of from 75-80°C. The oil, was slowly and continuously stirred to maintain the evenness. After the oil was poured into the mould, a wick was placed therein and after the oil had solidified at a suitable temperature, the solid state 20 of oil was further processed.

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CLAIMS:

1. A method of making a candle which includes the steps of heating one or both of a vegetable oil and a solidified oil to melt it, mixing the vegetable oil and solidified oil together, and then allowing the mixture to cool and solidify to provide the wax of the candle, the vegetable oil having a melting point of 35 to 37°C and having a palmitic content no more than 0.1 % and the solidified oil having the following characteristics: Acid Value below 0.5, Iodine Value below 2.0, Saponification Value between 195-198, Melting Point of 60 ± 1°C.
2. A method of making a candle as claimed in claim 1 which mixture further includes emulsifier.
3. A method as claimed in claim 1 which mixture further includes citric acid.
4. A method of making a candle as claimed in claim 1 which mixture further includes beta-carotene.
5. A method of making a candle as claimed in claim 1 which mixture further includes up to 2 % weight/volume of fragrance.
6. A method of making a candle as claimed in claim 1 which mixture further includes emulsifier, citric acid, beta-carotene and up to 2 % weight/volume of fragrance.
7. A method of making a candle as claimed in any of the preceding claims wherein the vegetable oil includes one or more components selected from palm oil, coconut oil, soy bean oil, cotton seed oil, palm



olein and hydrogenates of palm oil.

8. A method of making a candle as claimed in claims 1 to 6 wherein the vegetable oil comprises a mixture of palm oil, coconut oil, soy bean oil and cotton seed oil.
9. A method of making a candle as claimed in claim 7 or claim 8 wherein the components are present in the following quantities 50 to 58 % weight/volume of palm oil, 30-35 % weight/volume of coconut oil, 5 to 8 % weight/volume of soy bean oil and 5 to 8 % weight/volume of cotton seed oil.
10. A method as claimed in any one of claims 7 to 9 wherein the solidified oil is present at 80 to 90 % weight/volume and the soy bean oil is present at 10 to 20 % weight/volume.
11. A method of making a candle as claimed in any one of the preceding claims wherein the solidified oil has a water and impurities content below 0.2 % weight/volume.
12. A method of making a candle as claimed in any one of the preceding claims wherein the solidified oil is a refined mixture derived from a combination of palm oil and soy bean oil.
13. A method of making a candle as claimed in any preceding claims wherein the ratio of vegetable oil to solidified oil present is in the range of from 5 : 3 to 3 : 5.
14. A method of making a candle as claimed in claim 13 wherein the ratio of vegetable oil to solidified



oil is 5 : 3.

15. A method of making a candle as claimed in any one of the preceding claims wherein the vegetable oil is heated to 50°C before mixing with the solidified oil.
16. A method of making a candle as claimed in any one of the preceding claims which includes one or more steps selected from purifying, deacidifying, deodourising and decolouring the mixture.
17. A method of making a candle as claimed in any one of the preceding claims wherein after mixing the oil mixture is maintained at a temperature in the range of from 75 to 80°C, while it is poured into a mould and the room temperature is maintained in the range of from 18 to 22°C.
18. A method as claimed in any one of the preceding claims wherein before the mixture is allowed to solidify a wick is placed therein.
19. A method of making a candle as claimed in claim 18 wherein the ratio of vegetable oil to solidified oil is 3 : 5 and the candle is allowed to solidify without being poured into a mould.
20. A method of making a wax comprising mixing a vegetable oil with a melting point of 35 to 37°C and with a palmitic content no more than 0.1 % weight/volume with a solidified oil having the following characteristics: A.V. below 0.5, I.V. below 2.0, S.V. between 195-198, M.P. of 60 ± 1°C, and then allowing the mixture to solidify.



21. A candle, the wax of which comprises a mixture of a vegetable oil with a melting point of 35° to 37 C and with a palmitic content of no more than 0.1 % and a solidified oil
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Acid Value below 0.5, Iodine Value below 2.0,
Saporification Value between 195-198, Melting Point
of 60 ± 1°C.

10 22. A method of making a candle as substantially described herein other than as prior art.

23. A method of making a candle substantially as described herein with reference to Example 1 or
15 Example 2.

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