

PALM-BASED WAX COMPOSITION

FIELD OF INVENTION

The present invention relates to a wax composition comprising palm-based materials.

5 Particularly, the composition can be used in batik, encaustic and wax painting.

BACKGROUND OF THE INVENTION

Waxes are used in a variety of applications including polishing, candles, coating, crayons, sealants, electrical insulation, waterproofing, cosmetics, lubrications and
10 painting. There are two categories of wax, namely natural wax and synthetic wax. Waxes used in painting, such as batik painting and encaustic painting are usually mixtures of natural waxes, for example beeswax produced by honey bees of the genus *Apis* and paraffin wax derived from petroleum. Encaustic painting, also known as hot wax painting, involves painting using heated wax that contains dyes or pigments.

15 In batik printing, wax is used as a dye-resist agent. By covering a fabric with a layer of wax and dyeing the whole fabrics, the areas coated with wax will keep their original colour. The wax layer can be removed by scraping or boiling the fabric. Recently, synthetic waxes are being used to replace traditional beeswax-paraffin wax mixtures in batik manufacturing but majority of batik manufacturers are still using
20 beeswax-paraffin mixture. China Patent no. CN 102443992 discloses a method of wax painting on fabrics using a mixture of rosin, paraffin wax and beeswax.

Paraffin wax releases fume that may be hazardous to human health. This can be potentially dangerous for people whose work revolve around using paraffin wax, for example, batik manufacturing workers. Alternative waxes that do not risk health
25 should be developed.

SUMMARY OF THE INVENTION

The present invention aims to provide an alternative wax composition comprising palm-based wax with improved adhesive properties that could be used in batik, encaustic and wax painting.

- 5 Another object of the invention is to provide a method of producing wax from the wax composition of the present invention. The wax produced has a lower melting temperature as compared to the commercial wax, which is a mixture of paraffin wax and beeswax, used in batik manufacturing.

- 10 Further object of the invention is to provide an alternative wax for use in paintings, especially batik and encaustic painting. The wax produced comprises high amount of palm-based materials which is renewable and environmental friendly.

- At least one of the preceding objects is met, in whole or in part, by the present invention, in which one of the embodiments of the present invention is directed to a wax composition comprising a palm oil-based wax mixture in an amount of 70% to 15 95%, a non-palm oil-based wax in an amount of 1% to 30%, and a resin in an amount of 0.5% to 30%. The palm oil-based wax mixture comprises, by weight of the total palm oil-based wax mixture, 80% to 95% of palm fatty acid, 0.5% to 20% of palm-based fatty alcohol, and 0.5% to 10% of palm glyceride.

- 20 Preferably, the non-palm oil-based wax is beeswax, lanolin, carnauba wax, shellac wax, ouricury wax, rice bran wax, jojoba wax, sugar cane wax, castor wax, maize wax, candelilla wax, montan wax, paraffin wax, or synthetic wax.

Further, the resin is preferably rosin, damar gum, amber, or synthetic resin.

- In a preferred embodiment, the present invention also relates to a method of producing a wax from the wax composition comprising the steps of melting the palm 25 oil-based wax mixture through heating; adding the non-palm oil-based wax and resin, and stirring until the mixture melted; cooling the mixture with stirring to obtain an emulsion; and allowing the emulsion to solidify.

Further, the stirring during the cooling step is preferable to stop when the temperature of the mixture reach between 35°C and 50°C.

Another object of the invention is to produce a wax from the aforementioned wax composition for the use in batik, encaustic and wax painting.

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DETAILED DESCRIPTION OF THE INVENTION

It is to be understood that the present invention may be embodied in other specific forms and is not limited to the sole embodiment described herein. However, modification and equivalents of the disclosed concepts such as those which readily occur to one skilled in the art are intended to be included within the scope of the claims which are appended thereto.

According to the invention, a wax composition for use, for example, in batik manufacturing and wax painting comprising a palm oil-based wax mixture in an amount of 70% to 95%; a non-palm oil-based wax in an amount of 1% to 30%; and a resin in an amount of 0.5% to 30%. The palm oil-based wax mixture comprises, by weight of the total palm oil-based wax mixture, 80% to 95% of palm fatty acid; 0.5% to 20% of palm-based fatty alcohol; and 0.5% to 10% of palm glyceride.

In accordance with the preferred embodiment, the wax composition comprises a palm oil-based wax mixture in an amount of 82%, a non-palm oil-based wax in an amount of 3% and a resin in an amount of 15%.

The palm oil-based wax mixture is essentially derived from the palm fruits, including kernel and mesocarp. Common palm fatty acids include stearic acid, oleic acid, linoleic acid and palmitic acid. Palm fatty alcohol can be produced by fatty acid esterification to obtain methylester followed by hydrogenation of the methylester.

The non-palm oil-based wax can be natural or synthetic. Preferably, the non-palm oil-based wax is beeswax, lanolin, carnauba wax, shellac wax, ouricury wax, rice bran wax, jojoba wax, sugar cane wax, castor wax, maize wax, candelilla wax, montan

wax, paraffin wax, or synthetic wax. Exemplary synthetic waxes include polyethylene wax, ester wax and polymerized α -olefin wax. In the preferred embodiment, a mixture of beeswax and paraffin wax is used. Addition of non-palm oil-based wax alters the wax properties, for example viscosity, melting temperature, and crystal formation. The
5 type and amount of non-palm oil-based wax added depends on the desired properties of the wax produced.

In the preferred embodiment, the resin is preferably rosin, damar gum, amber, or synthetic resin. Resin, also known as binders, can improve the gloss potential, adhesion, hardness or flexibility properties of the wax produced. It also prevents the
10 wax layer from cracking. Exemplary synthetic resins include acrylics, polyurethanes, polyesters, melamine resins and epoxy. Some resins such as epoxy, melamine resins, and polyurethanes require an additional catalyst or agents to aid in hardening. In the preferred embodiment, rosin is included in the composition.

The wax composition may suitably include a pigment to allow differentiation of
15 waxes or to be used as a painting material. The amount of pigment added depends on the desired colour value and intensity. Exemplary pigments include carbon black, zinc chromate, phthalocyanine blue, iron oxide and oxazine.

Further, the present invention provides a method for producing wax from the wax composition comprising the steps of melting the palm oil-based wax mixture through
20 heating; adding the other ingredients and stirring until the mixture melted; cooling the mixture with stirring to obtain an emulsion; and allowing the emulsion to solidify.

Preferably, the stirring during the cooling step stops when the temperature of the mixture is cooled to between 35°C and 50°C. Essentially, the stirring enable the emulsion to achieve homogeneity and when the temperature is between 35°C and
25 50°C, the emulsion is ready to be poured or casted to allow solidification.

A wax may be prepared using the wax composition of the present invention by melting the palm oil-based wax mixture at a temperature between 55°C and 70°C. The non-palm oil-based wax and resin are added into the melted palm oil-based wax and the mixture is stirred for 1 to 30 minutes at a temperature between 65°C and 85°C

until melted. Stirring continues while cooling the mixture to obtain an emulsion and stops when the mixture temperature is at 35°C to 50°C. The emulsion is allowed to solidify at room temperature.

5 The large amount of palm-based materials in the wax compositions allows the formation of crystal structure when the emulsion solidifies. The crystal formation is affected by the cooling rate and the solidification rate. This unique property may be useful in encaustic or wax painting to provide an attractive pattern.

10 The wax produced according to the present invention has a melting temperature of 55°C to 70°C. It is lower than commercial batik wax, which usually comprises a mixture of paraffin wax and beeswax wherein the melting temperature is between 70°C and 80°C. Advantageously, waxes with lower melting temperature reduce risk of injury for individuals whose work involves using melted wax.

The wax may be produced in any desired shape and size. In most embodiments, the wax of the present invention is used in batik, encaustic and wax painting.

15 The present disclosure includes as contained in the appended claims, as well as that of the foregoing description. Although this invention has been described in its preferred form with a degree of particularity, it is understood that the present disclosure of the preferred form has been made only by way of example and that numerous changes in the details of construction and the combination and arrangements of parts may be
20 resorted to without departing from the scope of invention.

CLAIMS

1. A wax composition for use in batik, encaustic painting and wax painting comprising
 - a. a palm oil-based wax mixture in an amount of 70% to 95% by weight of total wax composition comprising
 - i. 80% to 95% by weight of palm fatty acid;
 - ii. 0.5% to 20% by weight of palm-based fatty alcohol; and
 - iii. 0.5% to 10% by weight of palm glyceride;
 - b. an non-palm oil-based wax in an amount of 1% to 30% by weight of total wax composition; and
 - c. a resin in an amount of 0.5% to 30% by weight of total wax composition.
2. A wax composition according to Claim 1, wherein the non-palm oil-based wax is selected from beeswax, lanolin, carnauba wax, shellac wax, ouricury wax, rice bran wax, jojoba wax, sugar cane wax, castor wax, maize wax, candelilla wax, montan wax, paraffin wax, or synthetic wax.
3. A wax composition according to Claim 1 or Claim 2, wherein the resin is rosin, damar gum, amber, or synthetic resin.
4. A method of producing a wax from a wax composition according to any one of Claim 1 to 3 comprising the steps of
 - a. melting the palm oil-based wax mixture through heating;
 - b. adding the other ingredients and stirring until the mixture melted;
 - c. cooling the mixture with stirring to obtain an emulsion; and
 - d. allowing the emulsion to solidify.

5. A method according to Claim 4, wherein the stirring during the cooling step is ceased when the temperature of the mixture is between 35°C and 50°C.