



(51) International Patent Classification:

A61K 8/31 (2006.01) *A61Q 5/06* (2006.01)
A61K 8/37 (2006.01) *A61Q 5/12* (2006.01)
A61K 8/41 (2006.01) *A61K 8/92* (2006.01)
A61Q 5/00 (2006.01) *A61K 8/02* (2006.01)

TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

(21) International Application Number:

PCT/BR2016/050313

Published:

— with international search report (Art. 21(3))

(22) International Filing Date:

02 December 2016 (02.12.2016)

(25) Filing Language:

English

(26) Publication Language:

English

(71) Applicant (for all designated States except AL): **L'OREAL**
[FR/FR]; 14, rue Royale, 75008 Paris (FR).

(72) Inventor; and

(71) Applicant (for AL only): **CONTRERAS, Carlos Granados** [MX/BR]; Ilha do Fundão 00, Via Projetada 1 do PAL 48212 n° 2100, Ilha do Bom Jesus, Cidade Universitária, 21941-972 Rio de Janeiro, RJ (BR).

(72) Inventors: **SILVA, Mariane Landim**; Ilha do Fundão 00, Via Projetada 1 do PAL 48212 n° 2100, Ilha do Bom Jesus, Cidade Universitária, 21941-972 Rio de Janeiro, RJ (BR).
DE CARVALHO, Leandro Valeriano; Ilha do Fundão 00, Via Projetada 1 do PAL 48212 n° 2100, Ilha do Bom Jesus, Cidade Universitária, 21941-972 Rio de Janeiro, RJ (BR).

(74) Agent: **CELIDONIO, Ana Paula Santos** et al.; Avenida Brigadeiro Faria Lima, 1485 - 11o Andar - Torre Norte, 01452-002 São Paulo, SP (BR).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ,

(54) Title: **HAIR CARE COMPOSITION AND METHODS OF USE**

(57) Abstract: The present disclosure relates hair care compositions, especially anhydrous compositions, comprising a combination of waxes having differing melting point, one or more oils, and one or more cationic surfactants. The combination of waxes includes: (i) one or more high melting point waxes having a melting point of about 71oC to about 90oC; (ii) one or more medium melting point waxes having a melting point of about 51oC to about 70oC; and (iii) optionally, one or more low melting point waxes having a melting point of about 31oC to about 50oC. Methods for making the hair care compositions and methods for using the hair care composition to impart durable styling and shaping benefits and/or frizz control to hair are also described.



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HAIR CARE COMPOSITION AND METHODS OF USE

FIELD OF THE DISCLOSURE

The present disclosure relates to hair care compositions comprising a combination of waxes, oils, and cationic surfactants. The disclosure also relates to methods for making the hair care compositions and methods for using the hair care composition to impart durable styling or shaping benefits and/or frizz control to hair.

BACKGROUND

Consumers desire new multi-functional hair care products that can impart good styling benefits to hair, are durable, even with several washings, and impart certain cosmetic characteristic to the hair. Such products should be pleasing to the senses, have innovative, interesting and/or pleasing textures, without loss in functional performance. Furthermore, many consumers prefer hair care products that provide a light feel, are easy to apply, and add shine and luster to the hair.

Traditional hair care products on the cosmetic market appear in various forms. They range anywhere from solutions, foams, gels, creams, waxes, mousses, sprays, serums, to aerosols and can impart a variety of levels of protection (or damage) to the hair depending on the state of the hair and the components of the product. Generally, products that are designed to impart styling or shaping benefits to hair are in the form of hair styling or hair care/hair treatment products. Such products are often sticky or tacky upon application and once dry, may become stiff and/or "crunchy" (*i.e.* the film is hard and brittle resulting in a crunching feel or sound when the hair is touched), which is undesirable for many consumers.

Current products for imparting styling or shaping benefits to hair often include water soluble film-forming polymers. Depending on the chemical make-up of these polymers, they may be either soluble in water, or they may be water insoluble polymers which are made water soluble via various chemical modifications, such as neutralization. Solutions comprising these polymers tend to be viscous, *i.e.* as the concentration of the polymer increases, its viscosity builds up rapidly. Translated to styling applications, as the solvent evaporates, the polymer solution becomes thicker on the hair surface, resulting in a sticky or tacky film.

SUMMARY OF THE DISCLOSURE

The instant disclosure relates to hair care compositions that have unique physical characteristics and impart desirable cosmetic properties when applied to hair. At room temperature, the compositions have a consistency similar to

dairy butter. When rubbed between an individual's hands, however, the compositions transform into a less viscous, oily-type products that are easily applied to the hair. Thus, the physical properties of the compositions resemble dairy butter (in terms of consistency and melting properties).

The hair care compositions are versatile. They can be used as leave-in products or they can be rinsed from the hair after application. In both scenarios, the compositions impart desirable properties to the hair. For example, the hair care compositions are useful for maintaining hair shape or style, achieving long-lasting frizz control (even under high humidity conditions), and imparting a pleasant texture and shine to hair. Upon application to the hair, the compositions have a clean, natural, and light-weight feel.

The hair care compositions typically include: (a) a combination of waxes having differing melting points; (b) one or more oils; and (c) one or more cationic surfactants. The combination of waxes can include, for example: (i) one or more high melting point waxes having a melting point of about 71°C to about 90°C; (ii) one or more medium melting point waxes having a melting point of about 51°C to about 70°C; and (iii) optionally, one or more low melting point waxes having a melting point of about 31°C to about 50°C. The dropping point of the hair care composition is typically about 60°C to about 80°C.

In some cases, the hair care compositions include at least ozokerite as a high melting point wax, and may optionally include at least both ozokerite and carnauba wax as high melting point waxes. In some instances, at least beeswax is included as a medium melting point wax. Likewise, if present, a non-limiting example of a low melting point wax that may be included is myristyl myristate.

The total amount of the combination of waxes may vary and will often depend on the additional components and the amounts of the additional components in the hair care composition. For example, in some cases, the total amount of the combination of waxes is about 10 to about 50 wt.%, based on the total weight of the hair care composition. The total amount of the one or more high melting point waxes may be, for example, about 1 to about 25 wt.%. The total amount of the one or more medium melting point waxes may be, for example, about 1 to about 25 wt.%. The total amount of the one or more low melting point waxes (if present) may be, for example, about 1 to about 25 wt.%.

As mentioned above, the hair care compositions include one or more

oils including, for example, one or more ester oils, one or more non-ester oils, one or more vegetable oils, one or more silicone oils, one or more hydrocarbon-based oils, and mixtures thereof.

In some cases, the hair care compositions include at least one ester-oil. Non-limiting examples of ester oils include esters of C₆₋₂₂ fatty acids with a monohydric alcohol and/or esters of C₆₋₂₂ fatty alcohols with a monocarboxylic acid. More specific non-limiting examples include isopropyl isostearate, n-propyl myristate, isopropyl myristate, hexyl laurate, hexadecyl isostearate, hexydecyl laurate, hexyldecyl octanoate, n-propyl palmitate, and isopropyl palmitate.

In some cases, the hair care compositions include at least one vegetable oil. Non-limiting examples of vegetable oils include almond oil, babassu oil (Orbigyna Oleifera Seed Oil), castor oil, Clark A oil, coconut oil, corn oil, cotton seed oil, jojoba oil, linseed oil, mustard oil, olive oil, palm oil, peanut oil, safflower oil, sesame oil, soybean oil, sunflower-seed oil and wheat germ oil.

The total amount of the one or more oils may vary and will often depend on the additional components and the amounts of the additional components in the hair care composition. For example, in some cases, the total amount of the one or more oils is about 50 to about 90 wt.%, based on the total weight of the hair care composition. The total amount of the one or more ester oils, if present, may be from about 30 to about 85 wt.%, based on the total weight of the hair care composition. The total amount of the one or more vegetable oils, if present, may be from about 1 to about 40 wt.%, based on the total weight of the hair care composition.

Cationic surfactants are well known. In some cases, useful cationic surfactants include optionally polyoxyalkylenated, primary, secondary and tertiary fatty amines and/or salts thereof. Likewise, in some cases, one or more cationic surfactant may be alkyl-quaternized ammonium salts. Although the total amount of the one or more cationic surfactants can vary, in some cases, the total amount is about 0.1 to about 10 wt.%, based on the total weight of the hair care composition.

In most instances, the hair care compositions are anhydrous, or essentially anhydrous. For example, the hair care compositions typically include less than about 3 wt.%, 2 wt.%, 1 wt.%, or 0.5 wt.% of water, based on the total weight of the hair care composition. Additionally, the hair care composition may be free of (or essentially free of) anionic surfactants and/or sulfates, and/or silicon. For example the hair care compositions typically include less than 3 wt.%, 2 wt.%, 1 wt.%, or 0.5 wt.%

of anionic surfactants and/or sulfates, and/or silicon.

The instant disclosure further relates to methods for making the hair care compositions of the instant disclosure. For example, the hair care compositions may be made by: (i) combining the combination high melting point, medium melting point, and optional low melting point waxes (as described herein) with the one or more oils (as described herein) and with one or more cationic surfactants (as described herein); (ii) heating the combination to a temperature at or above 85°C; and (iii) blending the combination until uniform, for example, by homogenization. Moreover, the instant disclosure relates to hair care compositions made by these methods.

The hair care compositions of the instant disclosure may be used in various methods for treating hair, for example, human hair, including human hair on an individual's head. For example, the compositions may be used in methods for: (i) improving or retaining curl definition of hair; (ii) imparting humidity resistance to hair; (iii) reducing hair frizz; (iv) controlling hair volume; (v) styling hair; (vi) straightening hair; and (vi) improving the appearance of hair. These methods typically involve applying a hair care composition disclosed herein to the hair, and optionally rinsing the composition from the hair. In some cases, the methods are particularly useful for naturally curly hair. The hair care compositions are useful in methods for imparting durable styling or shaping properties and/or frizz control to hair, the method comprising applying a hair care composition to hair, including naturally curly hair.

The hair care compositions may be in the form of any one of the following: a hair styling product, a rinse-off or leave-in hair conditioning product, a rinse-off or leave-in hair masque, or a rinse-off or leave-in hair treatment product.

DETAILED DESCRIPTION OF THE DISCLOSURE

The hair care compositions of the instant disclosure include multiple waxes having different melting points, one or more oils, and one or more cationic surfactants. The compositions have a semi-solid (malleable solid) consistency at room temperature, *i.e.*, a consistency similar to dairy butter. The dropping point of the hair care compositions is typically from about 60°C to about 80°C. The dropping point can be determined in accordance with DIN 51801. Thus, the hair care compositions melt easily when rubbed between the hands of a user and transform into a less viscous, oily-type product that is easily applied to the hair.

The multiple waxes in the hair care composition typically include:

- i. one or more high melting point waxes having a melting point of about 71°C to about 90°C;
- ii. one or more medium melting point waxes having a melting point of about 51°C to about 70°C; and
- iii. optionally, one or more low melting point waxes having a melting point of about 31°C to about 50°C.

The hair care compositions further include one or more oils. These oils are liquids at a temperature at or below 30°C. The hair care compositions also include one or more cationic surfactants. As mentioned above, the dropping point of the hair care compositions are typically from about 60°C to about 80°C. In some cases, the dropping point may be about 60°C to about 75°C, about 65°C to about 72°C, about 65°C to about 70°C, about 68°C to about 75°C, about 70°C to 75°C.

The waxes in the hair care compositions may be natural waxes and/or synthetic waxes. Natural waxes of different types are produced by plants and animals and occur in petroleum. Natural waxes may contain unsubstituted hydrocarbons, such as higher alkanes, but may also include various types of substituted long chain compounds, such as fatty acids, primary and secondary long chain alcohols, ketones and aldehydes. They may also contain esters of fatty acids and long chain alcohols. Synthetic waxes are long-chain hydrocarbons (alkanes or paraffins) that lack substituted functional groups.

Non-limiting examples of high melting point waxes include linear polyethylene, microcrystalline petroleum wax, ozokerite, carnauba wax, castor wax, esparto wax, shellac wax, sugarcane wax, lignite wax, ouricouri wax, rice bran wax, castor wax, mortar wax, stearin, montan wax, sugar cane wax, rice bran wax, polyethylene wax, sunflower wax, and mixtures thereof.

Non-limiting examples of medium melting point waxes include Japan wax, beeswax, ceresin wax, cocoa butter, ethylene glycol diesters or triesters of C₁₈-C₃₆ fatty acids, cetyl palmitate, glyceryl monostearate, jojoba wax, stearyl alcohol, silicone waxes, and combinations thereof, candelilla wax, stearyl stearate, jojoba esters, palm butter, and mixtures thereof.

Non-limiting examples of low melting point waxes include bayberry wax, petrolatum, illipe butter, myristyl myristate, paraffin wax, hard tallow, lanolin, lanolin alcohol, cetyl alcohol, kokum butter, Sal butter, Shea butter, spermaceti, hydrogenated castor oil, murumuru seed butter (*Astrocaryum murumuru*), and

mixtures thereof.

In some instances, the hair care compositions include at least ozokerite, or another natural wax, as a high melting point wax. In some cases, the hair care compositions include two or more high melting point waxes. For example, the hair care compositions can include at least ozokerite and carnauba wax as high melting point waxes.

In some instances, the hair care compositions include at least beeswax, or another natural wax, as a medium melting point wax. In some cases, the hair care compositions include two or more medium melting point waxes.

In some instances, the hair care compositions include at least myristyl myristate, or another ester wax, as a low melting point wax. In some cases, the hair care compositions include two or more low melting point waxes.

The total amount of the waxes (high, medium, and low melting point waxes) can vary but is typically in the range of about 10 to about 50 wt.%, based on the total weight of the hair care composition. In some cases, the total amount of the waxes is in the range of about 10 to about 45 wt.%, about 10 to about 40 wt.%, about 10 to about 30 wt.%, about 15 to about 50 wt.%, about 15 to about 45 wt.%, about 15 to about 40 wt.%, about 15 to about 30 wt.%, about 20 to about 50 wt.%, about 20 to about 45 wt.%, about 20 to about 30 wt.%, or about 15 to about 30 wt.%.

The total amount of the high melting point waxes can vary but is typically in the range of about 1 to about 25 wt.%, based on the total weight of the hair care composition. In some cases, the total amount of the high melting point waxes is in the range of about 1 to about 20 wt.%, about 1 to about 15 wt.%, about 5 to about 25 wt.%, about 5 to about 20 wt.%, or about 5 to about 15 wt.%. Furthermore, the total amount of the high melting point waxes may be at least 5 wt.%, at least 5.5 wt.%, or at least 6 wt.%; or may be from about 6 wt.% to about 25 wt.%, about 6 wt.% to about 20 wt.%, or about 6 wt.% to about 15 wt.%.

The total amount of the medium melting point waxes can vary but is typically in the range of about 1 to about 25 wt.%, based on the total weight of the hair care composition. In some cases, the total amount of the medium melting point waxes is in the range of about 1 to about 20 wt.%, about 1 to about 15 wt.%, about 1 wt.% to about 10 wt.%, about 3 wt.% to about 25 wt.%, about 3 wt.% to about 20 wt.%, about 3 wt.% to about 15 wt.%, about 3 wt.% to about 10 wt.%, about 4 wt.% to

about 25 wt.%, about 4 wt.% to about 20 wt.%, about 4 wt.% to about 15 wt.%, about 4 wt.% to about 10 wt.%, about 5 to about 25 wt.%, about 5 to about 20 wt.%, about 5 to about 15 wt.%, or about 5 wt.% to about 10 wt.%. Furthermore, the total amount of the medium melting point waxes may be at least 3 wt.%, at least 4 wt.%, at least 5 wt.%, or at least 6 wt.%, based on the total weight of the hair care composition.

The total amount of the low melting point waxes, if present, can vary but may be in the range of about 1 to about 25 wt.%, based on the total weight of the hair care composition. In some cases, the total amount of the low melting point waxes is in the range of about 1 to about 20 wt.%, about 1 to about 15 wt.%, about 5 to about 25 wt.%, about 5 to about 20 wt.%, or about 5 to about 15 wt.%. Furthermore, the total amount of the low melting point waxes, if present, may be less than 20 wt.%, 15 wt.%, 14 wt.%, 13 wt.%, 12 wt.%, 11 wt.%, 10 wt.%, 9 wt.%, or 8 wt.%. For instance, the total amount of the low melting point waxes, if present, may be from about 1 wt.% to about 20 wt.%, about 1 wt.% to about 15 wt.%, about 1 wt.% to about 12 wt.%, about 1 wt.% to about 10 wt.%, or about 1 wt.% to about 8 wt.%, based on the total weight of the hair care composition.

In some cases, the total amount of the high melting point waxes and the medium melting point waxes (regardless of whether the composition includes low melting point waxes) is about 10 wt.% to about 30 wt.%, about 10 wt.% to about 25 wt.%, about 12 wt.% to about 28 wt.%, about 12 wt.% to about 25 wt.%, or about 13 wt.% to about 21 wt.%, based on the total weight of the hair-care composition.

The hair care compositions include one or more oils, which may be any type of oil that is a liquid at or below a temperature of 30°C. For example, the oils may be ester-oils non-ester oils, or a combination of both. Many types of oils are known including vegetable oils, animal oils, mineral oils, synthetic oils, and silicone oils. In some cases the hair care composition can include one or more silicones or silicone oils but in other cases silicones and silicone oils are excluded. Examples of silicone oils include amine-functionalized silicones, *e.g.*, amodimethicone, dimethicone, bis-aminopropyl dimethicone, trimethyl silylamodimethicon, etc.

The total amount of the one or more oils may vary but is typically in an amount of about 50 to about 90 wt.%, based on the total weight of the hair care composition. In some cases, the total amount of the one or more oils is about 50 to about 85 wt.%, about 50 to about 80 wt.%, about 50 to about 75 wt.%, about 55 to about 90 wt.%, about 55 to about 85 wt.%, about 55 to about 80 wt.%, about 55 to

about 75 wt.%, about 60 to about 90 wt.%, about 60 to about 85 wt.%, about 60 to about 80 wt.%, about 60 to about 75 wt.%, about 65 to about 90 wt.%, about 65 to about 85 wt.%, about 65 to about 80 wt.%, about 65 to about 75 wt.%, about 70 to 90 wt.%, about 70 to about 85 wt.%, about 70 to about 80 wt.%, or about 70 to about 75 wt.%.

In some instances, the hair care compositions include one or more ester oils. For example, the one or more ester oils may be esters of C₆₋₂₂ fatty acids with a monohydric alcohol and/or esters of C₆₋₂₂ fatty alcohols with a monocarboxylic acid. Likewise, the one or more ester oils may be esters of C₆₋₁₈ fatty acids with a monohydric alcohol and/or esters of C₆₋₁₈ fatty alcohols with a monocarboxylic acid. Non-limiting examples of ester oils include butyl isostearate, butyl oleate, butyl octyl oleate, cetyl palmitate, cetyl octanoate, cetyl laurate, cetyl lactate, cetyl isononanoate, cetyl stearate, diisostearyl fumarate, diisostearyl malate, neopentyl glycol dioctanoate, dibutyl sebacate, di-C₁₂₋₁₃ alkyl malate, dicetearyl dimer dilinoleate, dicetyl adipate, diisocetyl adipate, diisononyl adipate, diisopropyl dimerate, triisostearyl trilinoleate, octadecyl stearyl stearate, hexyl laurate, hexadecyl isostearate, hexydecyl laurate, hexyldecyl octanoate, hexyldecyl oleate, hexyldecyl palmitate, hexyldecyl stearate, isononyl isononanoate, isostearyl isononate, isohexyl neopentanoate, isohexadecyl stearate, isopropyl isostearate, n-propyl myristate, isopropyl myristate, n-propyl palmitate, isopropyl palmitate, hexacosanyl palmitate, lauryl lactate, octacosanyl palmitate, propylene glycol monolaurate, triacontanyl palmitate, dotriacontanyl palmitate, tetratriacontanyl palmitate, hexacosanyl stearate, octacosanyl stearate, triacontanyl stearate, dotriacontanyl stearate, stearyl lactate, stearyl octanoate, stearyl heptanoate, stearyl stearate, tetratriacontanyl stearate, triarachidin, tributyl citrate, triisostearyl citrate, tri-C₁₂₋₁₃-alkyl citrate, tricaprylin, tricaprylyl citrate, tridecyl behenate, trioctyldodecyl citrate, tridecyl cocoate, tridecyl isononanoate, glyceryl monoricinoleate, 2-octyldecyl palmitate, 2-octyldodecyl myristate or lactate, di(2-ethylhexyl)succinate, tocopheryl acetate, and mixtures thereof.

Additional non-limiting examples of ester oils include butyl isostearate, butyl oleate, butyl octyl oleate, cetyl palmitate, cetyl octanoate, cetyl laurate, cetyl lactate, cetyl isononanoate, cetyl stearate, isopropyl isostearate, n-propyl myristate, isopropyl myristate, n-propyl palmitate, isopropyl palmitate, hexacosanyl palmitate, lauryl lactate, octacosanyl palmitate, propylene glycol monolaurate, triacontanyl palmitate, dotriacontanyl palmitate, tetratriacontanyl palmitate, hexacosanyl stearate,

octacosanyl stearate, triacontanyl stearate, dotriacontanyl stearate, stearyl lactate, stearyl octanoate, stearyl heptanoate, stearyl stearate, tetratriacontanyl stearate, and mixtures thereof.

The total amount of the one or more esters oils, if present, can vary but is typically in a range of about 30 to 85 wt.%, based on the total weight of the hair care composition. In some cases, the total amount of the one or more esters oils can be about 30 to about 80 wt.%, about 30 to about 75 wt.%, about 30 to about 70 wt.%, about 40 to about 85 wt.%, about 40 to about 80 wt.%, about 40 to about 75 wt.%, about 40 to about 70 wt.%, about 45 to about 85 wt.%, about 45 to about 80 wt.%, about 45 to about 75 wt.%, about 45 to about 70 wt.%, about 50 to about 85 wt.%, about 50 to about 80 wt.%, about 50 to about 75 wt.%, about 50 to about 70 wt.%, about 55 to about 85 wt.%, about 55 to about 80 wt.%, about 55 to about 75 wt.%, about 55 to about 70 wt.%, about 60 to about 85 wt.%, about 60 to about 80 wt.%, about 60 to about 75 wt.%, or about 60 to about 70 wt.%.

In some cases, the hair care compositions include one or more non-ester oils. However, in other cases, non-ester oils may be excluded. Non-limiting examples of non-ester oils include hydrocarbon based oils such as light liquid paraffin, squalene, squalane, polybutene and the like, fatty acids such as saturated middle chain fatty acid (e.g., caprylic acid, capric acid and the like), long chain unsaturated fatty acid (e.g., oleic acid, linolic acid, linolenic acid and the like), middle chain or long chain aliphatic alcohols and the like. The total amount of the one or more non-ester oils may vary, but when present, can be in an amount of about 1 to about 50 wt.%, based on the total weight of the hair care compositions. Likewise, the total amount of the one or more non-ester oils may be about 1 to about 40 wt.%, about 1 to about 30 wt.%, about 1 to about 20 wt.%, about 1 to about 10 wt.%, about 1 to about 5 wt.%, about 5 to about 50 wt.%, about 5 to about 40 wt.%, about 5 to about 30 wt.%, about 5 to about 20 wt.%, about 5 to about 10 wt.%, about 10 to about 50 wt.%, about 10 to about 40 wt.%, about 10 to about 30 wt.%, about 10 to about 20 wt.%, about 20 to about 50 wt.%, about 20 to about 40 wt.%, about 20 to about 30 wt.%, or about 30 to about 50 wt.%.

In some instances, the hair care composition may include one or more vegetable oils, which are separate and/or in addition to the one or more ester-oils (and the one or more non-ester oils) discussed above. Non-limiting examples of vegetable oils include almond oil, babassu oil (*orbigyna oleifera* seed oil), castor oil,

Clark A oil, coconut oil, corn oil, cotton seed oil, jojoba oil, linseed oil, mustard oil, olive oil, palm oil, peanut oil, safflower oil, sesame oil, soybean oil, sunflower-seed oil and wheat germ oil.

The total amount of the one or more vegetable oils, if present, can vary but is typically in an a range of about 1 to 40 wt.%, based on the total weight of the hair care composition. Likewise, the total amount of the one or more vegetable oils may be about 1 to about 35 wt.%, about 1 to about 30 wt.%, about 1 to about 25 wt.%, or about 1 to about 20 wt.%.

The hair care compositions of the instant disclosure typically include one or more cationic surfactants. Many cationic surfactants are known in the art. For example, non-limiting, cationic surfactants useable in the hair care compositions include optionally polyoxyalkylenated, primary, secondary and tertiary fatty amines and/or salts thereof. Similarly, the one or more cationic surfactants may include one or more alkyl-quaternized ammonium salts (e.g., behentrimonium chloride and/or stearyltrimethylammonium chloride, etc.). For instance, the hair care compositions can include one or more C₂₀-C₂₄ quaternary ammonium compounds, such as those selected from the group consisting of behentrimonium chloride, behenamidopropyl PG-dimonium chloride, behenalkanium chloride, behenoyl PG-trimonium chloride, dibehenyl/diarachidyl dimonium chloride, dibehenyldimonium chloride, and mixtures thereof. In some cases, the hair care compositions include one or more alkyl-quaternized ammonium salt selected from the group consisting of Stearalkonium chloride, Cetrimonium chloride, cetrimonium bromide, behentrimonium methosulfate, behentrimonium chloride, benzalkonium chloride, cinnamidopropyltrimonium chloride, cocotrimonium chloride, dicetyldimonium chloride, dicocodimonium chloride, hydrogenated palm trimethylammonium chloride, lauryltrimonium chloride, quaternium-15, quaternium-22, and a mixture thereof.

The total amount of the one or more cationic surfactants can vary but is typically in a range of about 0.1 to about 10 wt.%, based on the total weight of the hair care composition. In some cases the total amount of the one or more cationic surfactants is about 0.1 to about 8 wt.%, 0.1 to about 6 wt.%, 0.1 to about 5 wt.%, 0.1 to about 5 wt.%, about 0.5 to about 10 wt.%, 0.5 to about 8 wt.%, 0.5 to about 6 wt.%, 0.5 to about 5 wt.%, about 0.5 to 4 wt.%, about 1 to about 10 wt.%, about 1 to about 8 wt.%, about 1 to about 6 wt.%, about 1 to about 5 wt.%, or about 1 to about 4 wt.%.

The hair care compositions typically are anhydrous or essentially

anhydrous. In other words, the hair care compositions do not include an appreciable amount of water. For instance, the hair care compositions typically include no or less than about 5 wt.%, 4 wt.%, 3 wt.%, 2 wt.%, 1 wt.%, or 0.5 wt.% of water, based on the total weight of the hair care composition.

In some cases, the hair care compositions are free or essentially free of anionic surfactants. In some cases the hair care compositions are free or essentially free of sulfate-containing surfactants. In some cases, the hair care compositions are free or essentially free of silicone. In some cases, the hair care compositions are free or essentially free of silicone and/or silicone oils. In other words, in each case, the hair care compositions include no or less than about 5 wt.%, 4 wt.%, 3 wt.%, 2 wt.%, 1 wt.%, or 0.5 wt.% of the anionic surfactants and/or sulfate-containing surfactants and/or silicon and/or silicone and/or silicone oils.

A non-limiting examples of an essentially anhydrous hair care composition includes: (a) a combination of waxes, the combination comprising:

- i. one or more high melting point waxes having a melting point of about 71°C to about 90°C;
- ii. one or more medium melting point waxes having a melting point of about 51°C to about 70°C; and
- iii. optionally, one or more low melting point waxes having a melting point of about 31°C to about 50°C;

(b)(i) about 30 to about 85 wt.% of one or more ester oils that are liquid at a temperature at or below 30°C, wherein the one or more ester oils are esters of C₆₋₂₂ fatty acids with a monohydric alcohol and/or esters of C₆₋₂₂ fatty alcohols with a monocarboxylic acid; b(ii) about 1 to about 40 wt.% of one or more vegetable oils that are liquid at a temperature at or below about 30°C; and (c) about 0.1 to about 10 wt.% of one or more alkyl-quaternized ammonium salts; wherein the dropping point of the composition is from about 60°C to about 80°C. Each component of the above, non-limiting example, can be further narrowed in accordance with the instant disclosure, i.e., it is not limited to the ranges, generic classes, etc. For example, in some instances, the hair care composition includes at least ozokerite, or another natural wax, as a high melting point wax, or two or more high melting point waxes such as at least ozokerite and carnauba wax. In some instances, the hair care composition includes at least beeswax, or another natural wax, as a medium melting point wax. Furthermore, in some cases, the hair care composition includes at least

myristyl myristate, or another ester wax, as a low melting point wax.

The compositions may be packaged in a variety of different containers, such as, for example, a ready-to-use container. Since the texture can range from buttery to lipstick-like, non-limiting examples of packaging include squeezable tubes, jars, caps, unit dose packages, and bottles.

The instant disclosure further relates to methods for making the hair care compositions described herein. For example, the hair care compositions may be made by: (i) combining the combination high melting point, medium melting point, and optional low melting point waxes described above with one or more oils and with one or more cationic surfactants; (ii) heating the combination to a temperature at or above 85°C; and (iii) blending the combination until uniform, for example, by homogenization. Moreover, the instant disclosure relates to hair care compositions made by the methods described above.

The hair care compositions described may be used in various methods for treating hair, for example, human hair, including human hair on an individual's head. The compositions may be used in methods for: (i) improving or retaining curl definition of hair; (ii) imparting humidity resistance to hair; (iii) reducing hair frizz; (iv) controlling hair volume; (v) styling hair; (vi) straightening hair; and (vi) improving the appearance of hair. These methods typically involve applying a hair care composition disclosed herein to the hair, and in some cases are particularly useful for naturally curly hair. The hair care compositions are useful in methods for imparting durable styling or shaping properties and/or frizz control to hair, the method comprising applying a hair care composition to hair, including naturally curly hair.

The hair care compositions described herein may be in the form of any one of the following: a hair styling product, a rinse-off or leave-in hair conditioning product, a rinse-off or leave-in hair masque, or a rinse-off or leave-in hair treatment product.

More exhaustive but non-limiting lists of components useful in the hair care composition of the instant disclosure are provided below.

WAXES

The table below includes non-limiting lists of various waxes useable in the hair care compositions of the instant disclosure. The tables also include the approximate melting points of the waxes.

High Melting Point Waxes (71°C-90°C)	
INCI name and/or Trade name	Approximate Melting Point
wax AC 400	86.3 °C
Hydrogenated Castor oil	85.07 °C
microcrystalline wax	83.3 °C
Carnauba wax	82.3 °C
Hydrogenated Castor wax	81.7 °C
Chinese insect wax	81.1 °C
Vegetable Wax	81.0 °C
Fischer-tropsch wax	79.3 °C
Hydroxyoctacosanyl Hydroxystearate	76.8 °C
rice bran wax	78.6 °C
Phytowax Ricin 22 L 73	76.6 °C
Alcohol polyethylene wax	76.2 °C
Helianthus Annuus (Sunflower) Seed Wax	75.46 °C
DI 18/22 OCTANEDIOATE	75.15 °C
Behenyl fumarate	74.5 °C
Shellac wax	73.8 °C
C20-40 Alkyl Stearate	72.5 °C
Betawax RX-13750	72.0 °C
polyethylene wax	71.8 - 85 °C
Synthetic Wax	70.7 °C

Medium Melting Point Waxes (51°C-70°C)	
INCI name and/or Trade name	Approximate Melting Point
Koster wax K82P (anc.K80P)	69.6 °C
Hydrogenated Jojoba wax	69.4 °C
Phytowax Ricin 16 L 64	69.1 °C
Tricontanyl/PVP	68.8 °C
K82P-S	67.97 °C
Polymethylalkyl dimethylsiloxane	67.8 °C
Dipentaerythrytol hexastearate	67.7 °C
Ditrimethylolpropane tetrabeheenate	67.5 °C

Medium Melting Point Waxes (51°C-70°C)	
INCI name and/or Trade name	Approximate Melting Point
behenyl alcohol	66.9 °C
siliconyl candellila wax	66.8 °C
Ozokerite	66.8 °C
DI 18/22 SEBACATE	66.44 °C
K82P-VS.	66.20 °C
Koster KPC-63	65.2 °C
Tetracontanyl Stearate	65.1 °C
Candelilla wax	64.3 °C
DI 18/22 ADIPATE	64.13 °C
fatty acid wax	63.7 °C
Montan Wax	63.4 °C
polyglycerol beeswax	63.1 °C
Pentaerythrityl tetrastearate	63.0 °C
Beeswax	62.6 °C
Koster KPC-60	61.7 °C
Ultrabee WD	61.3 °C
ceresin wax	60.1 °C
Stearic alcohol	58.8 °C
Phytowax Olive 18 L 57 (hydrogenated stearyl olive esters)	58.6 °C
Koster KPC-56	58.5 °C
palm butter	58.4 °C
Citrus Medica Limonum (Lemon) Peel Extract	58.3 °C
Paraffin wax	57.3 °C
Stearyl Stearate	57.1 °C
alkyl dimethicone wax	57.0°C
Jojoba esters	56.7 °C
Diocetadecyl Carbonate	56.7 °C
Silicone resin wax (Dow Corning® SW-8005)	54.3 - 65.6°C
siliconyl beeswax	53.4 °C
Waxolive	55.8 °C

Medium Melting Point Waxes (51°C-70°C)	
INCI name and/or Trade name	Approximate Melting Point
Koster KPC-80	55.6 °C
Clariant Licowax KST 1	55.2 °C
Hydrogenated Castor Oil Isostearate	54.0 °C
Hydrogenated Castor Oil Isostearate	52.5 °C
Hydrogenated Macadamia Seed Oil	51.49 °C
Synthetic Wax	51.4 °C
synthetic beeswax	51.2 °C

Low Melting Point Waxes (31°C-50°C)	
INCI name and/or Trade name	Approximate Melting Point
Behenyl methacrylate grafted PDMS	48.6 °C
Pentaerythritol Distearate	48.5 °C
sumac wax	48.3 °C
Berry wax	47.5 °C
Ditrimethylolpropane tetrastearate	46.5 °C
Phytowax Olive 14 L 48 (hydrogenated myristyl olive esters)	46.02 °C
Burco LB-02	45.1 °C
Citrus Aurantium Dulcis (Orange) Peel Wax	40.7 °C
Stearyl Benzoate	40.6 °C
Koster BK-42	40.5 °C
Inholive	40.3 °C
Koster BK-37	38.0 °C
PVP/Eicosene Copolymer	37.8 °C
Theobroma Grandiflorum Seed Butter	36.94 °C
Murumuru Seed Butter	33.0 °C

OILS

The hair care compositions may include one or more oils, for example, ester oils, silicone oils, fluoro oils, hydrocarbon-based oils, non-ester oils, vegetable oils, animals oils, etc. The term "oil" means any fatty substance which is in liquid form at room temperature (below or at a temperature of about 30°C.) and at atmospheric

pressure (760 mmHg).

ESTER OILS

Esters of C₄-C₂₂ dicarboxylic or tricarboxylic acids and of C₁-C₂₂ alcohols and esters of monocarboxylic, dicarboxylic or tricarboxylic acids and of non-sugar C₄-C₂₆ dihydroxy, trihydroxy, tetrahydroxy or pentahydroxy alcohols may also be used.

Mention may be made of: diethyl sebacate; isopropyl lauroyl sarcosinate; diisopropyl sebacate; bis(2-ethylhexyl) sebacate; diisopropyl adipate; di-n-propyl adipate; dioctyl adipate; bis(2-ethylhexyl) adipate; diisostearyl adipate; bis(2-ethylhexyl) maleate; triisopropyl citrate; triisocetyl citrate; triisostearyl citrate; glyceryl trilactate; glyceryl trioctanoate; trioctyldodecyl citrate; trioleyl citrate; neopentyl glycol diheptanoate; diethylene glycol diisononanoate.

As ester oils, one can use sugar esters and diesters of C₆-C₃₀ and preferably C₁₂-C₂₂ fatty acids. The term "sugar" means oxygen-bearing hydrocarbon-based compounds containing several alcohol functions, with or without aldehyde or ketone functions, and which comprise at least 4 carbon atoms. These sugars may be monosaccharides, oligosaccharides or polysaccharides. Examples of suitable sugars that may be mentioned include sucrose (or saccharose), glucose, galactose, ribose, fucose, maltose, fructose, mannose, arabinose, xylose and lactose, and derivatives thereof, especially alkyl derivatives, such as methyl derivatives, for instance methylglucose.

The sugar esters of fatty acids may be chosen especially from the group comprising the esters or mixtures of esters of sugars described previously and of linear or branched, saturated or unsaturated C₆-C₃₀ and preferably C₁₂-C₂₂ fatty acids. If they are unsaturated, these compounds may have one to three conjugated or non-conjugated carbon-carbon double bonds. The esters according to this variant may also be selected from monoesters, diesters, triesters, tetraesters and polyesters, and mixtures thereof. These esters may be, for example, oleates, laurates, palmitates, myristates, behenates, cocoates, stearates, linoleates, linolenates, caprates and arachidonates, or mixtures thereof such as, especially, oleopalmitate, oleostearate and palmitostearate mixed esters, as well as pentaerythrityl tetraethyl hexanoate.

More particularly, use is made of monoesters and diesters and especially sucrose, glucose or methylglucose monooleates or dioleates, stearates, behenates, oleopalmitates, linoleates, linolenates and oleostearates.

As examples of non-limiting ester oils, mention may be made of, for example, diisopropyl adipate, dioctyl adipate, 2-ethylhexyl hexanoate, ethyl laurate, cetyl octanoate, octyldodecyl octanoate, isodecyl neopentanoate, myristyl propionate, 2-ethylhexyl 2-ethylhexanoate, 2-ethylhexyl octanoate, 2-ethylhexyl caprylate/caprate, methyl palmitate, ethyl palmitate, isopropyl palmitate, dicaprylyl carbonate, isopropyl lauroyl sarcosinate, isononyl isononanoate, ethylhexyl palmitate, isohexyl laurate, hexyl laurate, isocetyl stearate, isopropyl isostearate, isopropyl myristate, isodecyl oleate, glyceryl tri(2-ethylhexanoate), pentaerythrithyl tetra(2-ethylhexanoate), 2-ethylhexyl succinate, diethyl sebacate, and mixtures thereof.

VEGETABLE OILS

As used herein the term "vegetable" is interpreted broadly so that it encompasses all plants of the kingdom Plantae. Non-limiting examples of vegetable oils include coconut oil, Corn oil, Cottonseed oil, Olive oil, Palm oil, Peanut oil, Rapeseed oil, Safflower oil, Sesame oil, Soybean oil, and Sunflower oil. Non-limiting examples of nut-derived vegetable oils include Hazelnut oil, Almond oil, Beech nut oil, Brazil nut oil, Extra virgin oil, Cashew oil, Macadamia oil, Mongongo nut oil (or manketti oil), Pecan oil, Pine nut oil, Pistachio oil, and Walnut oil. Non-limiting examples of citrus oil include Grapefruit seed oil, Lemon oil, Orange oil. Non-limiting examples of oils from melon and gourd seeds include Watermelon seed oil, Bitter gourd oil, Bottle gourd oil, Buffalo gourd oil, Butternut squash seed oil, Egusi seed oil, Pumpkin seed oil. Additional non-limiting examples of oils include Borage seed oil, blackcurrant seed oil, and evening primrose oil, which all have a significant amount of gamma-Linolenic acid (GLA), Açaí oil, Black seed oil, Blackcurrant seed oil, Borage seed oil, Evening primrose oil, Flaxseed oil (called linseed oil when used as a drying oil), Amaranth oil, Apricot oil, Apple seed oil, Argan oil, Avocado oil, Babassu oil, Ben oil, Borneo tallow nut oil, Cape chestnut oil, Carob pod oil (Algaroba oil), Cocoa butter, Cocklebur oil, Cohune oil, Coriander seed oil, Date seed oil, Dika oil, False flax oil made of the seeds of *Camelina sativa*, Grape seed oil, Hemp oil, Kapok seed oil, Kenaf seed oil, *Lallemantia* oil, Mafura oil, Marula oil, Meadowfoam seed oil, Mustard oil (pressed), poppyseed oil, Okra seed oil, Papaya seed oil, Perilla seed oil, Persimmon seed oil, Pequi oil, Pili nut oil, Pomegranate seed oil, and Pracaxi oil.

NON-ESTER OILS

The at least one non-ester oil may be chosen from natural, synthetic, saturated and unsaturated oils, including mineral oils. Mention may be made of linear,

branched and/or cyclic alkanes which may be volatile and, in particular, liquid paraffin, liquid petroleum jelly or hydrogenated polyisobutylene, isododecane or "Isopars", and volatile isoparaffins.

Mention may also be made of aliphatic fatty liquid monoalcohols containing 6 to 40 carbon atoms, the hydrocarbon-based chain not comprising a substitution group. Monoalcohols according to the invention that may be mentioned include oleyl alcohol, decanol, octyldodecanol and linoleyl alcohol.

Mention may also be made of silicone oils such as polydimethylsiloxanes and polymethylphenylsiloxanes, optionally substituted with aliphatic and/or aromatic groups, which are optionally fluorinated, or with functional groups such as hydroxyl, thiol and/or amine groups, and volatile silicone oils, which are especially cyclic.

In particular, mention may be made of volatile and/or non-volatile, optionally branched silicone oils. The term "volatile oil" means oil capable of evaporating from the skin or the lips in less than one hour, and especially having a vapor pressure, at room temperature and atmospheric pressure, ranging from 10^{-3} to 300 mmHg (0.13 Pa to 40,000 Pa).

As volatile silicone oils, mention may be made of linear or cyclic silicones containing from 2 to 7 silicon atoms, these silicones optionally comprising alkyl or alkoxy groups containing from 1 to 10 carbon atoms. Mention may be made in particular of octamethylcyclotetrasiloxane, decamethylcyclopentasiloxane, dodecamethylcyclohexasiloxane, heptamethylhexyltrisiloxane, heptamethyloctyltrisiloxane, octamethyltrisiloxane and decamethyltetrasiloxane, and mixtures thereof.

Among the non-volatile silicone oils that may be mentioned are non-volatile polydialkylsiloxanes, such as non-volatile polydimethylsiloxanes (PDMS); polydimethylsiloxanes comprising alkyl, alkoxy or phenyl groups, which are pendent or at the end of a silicone chain, these groups containing from 2 to 24 carbon atoms; phenyl silicones, for instance phenyl trimethicones, phenyl dimethicones, phenyl trimethyl-siloxy diphenylsiloxanes, diphenyl dimethicones, diphenyl methyldiphenyltrisiloxanes and polymethyl-phenylsiloxanes; polysiloxanes modified with fatty acids (especially of C₈-C₂₀), fatty alcohols (especially of C₈-C₂₀) or polyoxyalkylenes (especially polyoxy-ethylene and/or polyoxypropylene); amino polysiloxanes; polysiloxanes containing hydroxyl groups; fluoro poly-siloxanes

comprising a fluorinated group that is pendent or at the end of a silicone chain, containing from 1 to 12 carbon atoms, all or some of the hydrogen atoms of which are replaced with fluorine atoms; and mixtures thereof.

SILICONE OILS

The term "silicone oil" relates to oil comprising at least one silicon atom, and especially at least one Si-O group. The term "fluoro oil" relates to oil comprising at least one fluorine atom. The term "hydrocarbon-based oil" relates to oil comprising mainly hydrogen and carbon atoms. Hydrocarbon-based oil may be animal hydrocarbon-based oil, plant hydrocarbon-based oil, mineral hydrocarbon-based oil or a synthetic hydrocarbon-based oil. Further, suitable oil may be a mineral hydrocarbon-based oil, a plant hydrocarbon-based oil, or a synthetic hydrocarbon-based oil.

The cosmetic compositions described herein may comprise one or more silicone oils. Non-limiting examples of silicone oils include dimethicone, cyclomethicone, polysilicone-11, phenyl trimethicone, trimethylsilylamodimethicone, and stearoxytrimethylsilane. In some cases, the cosmetic composition includes dimethicone, and optionally additional oils, including additional silicone oils. Typically, the one or more silicone oils is a non-volatile silicon oil. In some embodiments, the silicone oil is polydimethylsiloxanes (PDMSs), polydimethylsiloxanes comprising alkyl or alkoxy groups which are pendent and/or at the end of the silicone chain, which groups each contain from 2 to 24 carbon atoms, or phenyl silicones, such as phenyl trimethicones, phenyl dimethicones, phenyl(trimethylsiloxy)diphenylsiloxanes, diphenyl dimethicones, diphenyl(methyldiphenyl)trisiloxanes or (2-phenylethyl)trimethylsiloxysilicates.

Other examples of silicone oils that may be mentioned include volatile linear or cyclic silicone oils, especially those with a viscosity 8 centistokes (8×10^{-6} m²/s) and especially containing from 2 to 7 silicon atoms, these silicones optionally comprising alkyl or alkoxy groups containing from 1 to 10 carbon atoms. As volatile silicone oils that may be used in the disclosure, mention may be made especially of octamethylcyclotetrasiloxane, decamethylcyclopentasiloxane, dodecamethylcyclohexasiloxane, heptamethylhexyltrisiloxane, heptamethyloctyltrisiloxane, hexamethyldisiloxane, octamethyltrisiloxane, decamethyltetrasiloxane and dodecamethylpentasiloxane, and mixtures thereof.

FLUORO OILS

The cosmetic compositions described herein may comprise one or more fluoro oils. For example, the one or more fluoro oil may be selected from the group consisting of perfluoromethylcyclopentane, perfluoro-1,3-dimethylcyclohexane, dodecafluoropentane, tetradecafluorohexane, bromoperfluorooctyl, nonafluoromethoxybutane, nonafluoroethoxyisobutane and 4-trifluoromethyl perfluoromorpholine. Volatile fluoro oils, such as nonafluoromethoxybutane, decafluoropentane, tetradecafluorohexane, dodecafluoropentane, may also be used.

HYDROCARBON-BASED OILS

The cosmetic compositions described herein may comprise one or more hydrocarbon-based oils. For example, the hydrocarbon-based oil may be a saturated hydrocarbon, an unsaturated hydrocarbon, lipids, triglycerides, a natural oil, and/or a synthetic oil. In some embodiments, the compositions include a synthetic oil selected from the group consisting of hydrogenated polyisobutene and hydrogenated polydecene.

The hydrocarbon-based oil may be a non-volatile hydrocarbon-based, such as:

(i) hydrocarbon-based oils of plant origin, such as glyceride triesters, which are generally triesters of fatty acids and of glycerol, the fatty acids of which can have varied chain lengths from C₄ to C₂₄, it being possible for these chains to be saturated or unsaturated and linear or branched; these oils are in particular wheat germ oil, sunflower oil, grape seed oil, sesame oil, corn oil, apricot oil, castor oil, shea oil, avocado oil, olive oil, soybean oil, sweet almond oil, palm oil, rapeseed oil, cottonseed oil, hazelnut oil, macadamia oil, jojoba oil, alfalfa oil, poppy oil, pumpkin seed oil, marrow oil, blackcurrant oil, evening primrose oil, millet oil, barley oil, quinoa oil, rye oil, safflower oil, candlenut oil, passionflower oil, and musk rose oil.

(ii) synthetic ethers containing from 10 to 40 carbon atoms;

(iii) linear or branched hydrocarbons of mineral or synthetic origin, such as petroleum jelly, polydecenes, hydrogenated polyisobutene such as Parleam, and 40 squalane;

(iv) synthetic esters, for instance oils of formula RCOOR' in which R represents a linear or branched fatty acid residue containing from 1 to 40 carbon atoms and R' represents a hydrocarbon-based chain that is especially branched, containing from 1 to 40 carbon atoms on condition that R+R' is ≥ 10 , for instance Purcellin oil (cetearyl octanoate), isopropyl myristate, isopropyl palmitate, C₁₂-C₁₅

alkyl benzoate, such as the product sold under the trade name Finsolv TN® or Witconol TN® by Witco or Tegosoft TN® by Evonik Goldschmidt, 2-ethylphenyl benzoate, such as the commercial product sold under the name X-Tend 226 by ISP, isopropyl lanolate, hexyl laurate, diisopropyl adipate, isononyl isononanoate, oleyl erucate, 2-ethylhexyl palmitate, isostearyl isostearate, diisopropyl sebacate, such as the product sold under the name of "Dub Dis" by Stearinerie Dubois, octanoates, decanoates or ricinoleates of alcohols or polyalcohols, such as propylene glycol dioctanoate; hydroxylated esters, such as isostearyl lactate or diisostearyl malate; and pentaerythritol esters; citrates or tartrates, such as di(linear C₁₂-C₁₃ alkyl) tartrates, such as those sold under the name Cosmacol ETI® by Enichem Augusta Industriale, and also di(linear C₁₄-C₁₅ alkyl) tartrates, such as those sold under the name Cosmacol ETL® by the same company; or acetates;

(v) fatty alcohols that are liquid at room temperature, containing a branched and/or unsaturated carbon-based chain containing from 12 to 26 carbon atoms, for instance octyldodecanol, isostearyl alcohol, oleyl alcohol, 2-hexyldecanol, 2-butyloctanol or 2-undecylpentadecanol;

(vi) higher fatty acids, such as oleic acid, linoleic acid or linolenic acid;

(vii) carbonates, such as dicaprylyl carbonate, such as the product sold under the name Cetiol CC® by Cognis;

(viii) fatty amides, such as isopropyl N-lauroyl sarcosinate, such as the product sold under the trade name Eldew SL 205® from Ajinomoto; and

(ix) essential oils selected from the group consisting of sunflower oil, sesame oil, peppermint oil, macadamia nut oil, tea tree oil, evening primrose oil, sage oil, rosemary oil, coriander oil, thyme oil, pimento berries oil, rose oil, anise oil, balsam oil, bergamot oil, rosewood oil, cedar oil, chamomile oil, sage oil, clary sage oil, clove oil, cypress oil, eucalyptus oil, fennel oil, sea fennel oil, frankincense oil, geranium oil, ginger oil, grapefruit oil, jasmine oil, juniper oil, lavender oil, lemon oil, lemongrass oil, lime oil, mandarin oil, marjoram oil, myrrh oil, neroli oil, orange oil, patchouli oil, pepper oil, black pepper oil, petitgrain oil, pine oil, rose otto oil, rosemary oil, sandalwood oil, spearmint oil, spikenard oil, vetiver oil, wintergreen oil, and ylang ylang .

In certain instances, the non-volatile hydrocarbon-based oils are glyceride triesters and in particular to caprylic/capric acid triglycerides, synthetic

esters and in particular isononyl isononanoate, oleyl erucate, C₁₂-C₁₅ alkyl benzoate, 2-ethylphenyl benzoate and fatty alcohols, such as octyldodecanol.

As volatile hydrocarbon-based oils, mention is made of hydrocarbon-based oils containing from 8 to 16 carbon atoms and in particular of branched C₈-C₁₆ alkanes, such as C₈-C₁₆ isoalkanes of petroleum origin (also known as isoparaffins), such as isododecane (also known as 2,2,4,4,6-pentamethylheptane), isodecane or isohexadecane, the oils sold under the Isopar or Permethyl trade names, branched C₈-C₁₆ esters, and isohexyl neopentanoate.

CATIONIC SURFACTANTS

The term "cationic surfactant" means a surfactant that is positively charged when it is contained in the composition according to the disclosure. This surfactant may bear one or more positive permanent charges or may contain one or more functions that are cationizable in the composition according to the disclosure.

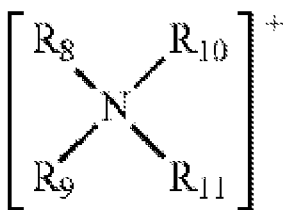
Non-limiting examples of cationic surfactants include behenalkonium chloride, benzethonium chloride, cetylpyridinium chloride, behentrimonium chloride, lauralkonium chloride, cetalkonium chloride, cetrimonium bromide, cetrimonium chloride, cethylamine hydrofluoride, chlorallylmethenamine chloride (Quaternium-15), distearyldimonium chloride (Quaternium-5), dodecyl dimethyl ethylbenzyl ammonium chloride (Quaternium-14), Quaternium-22, Quaternium-26, Quaternium-18 hectorite, dimethylaminoethylchloride hydrochloride, cysteine hydrochloride, diethanolammonium POE (10) oleyl ether phosphate, diethanolammonium POE (3)oleyl ether phosphate, tallow alkonium chloride, dimethyl dioctadecylammoniumbentonite, stearalkonium chloride, domiphen bromide, denatonium benzoate, myristalkonium chloride, laurtrimonium chloride, ethylenediamine dihydrochloride, guanidine hydrochloride, pyridoxine HCl, iofetamine hydrochloride, meglumine hydrochloride, methylbenzethonium chloride, myrtrimonium bromide, oleyltrimonium chloride, polyquaternium-1, procainehydrochloride, cocobetaine, stearalkonium bentonite, stearalkoniumhectonite, stearyl trihydroxyethyl propylenediamine dihydrofluoride, tallowtrimonium chloride, and hexadecyltrimethyl ammonium bromide.

The cationic surfactant(s) may be chosen from optionally polyoxyalkylenated, primary, secondary or tertiary fatty amines, or salts thereof, and quaternary ammonium salts, and mixtures thereof.

The fatty amines generally comprise at least one C₈-C₃₀ hydrocarbon-

based chain.

Examples of quaternary ammonium salts that may especially be mentioned include: those corresponding to the general formula (III) below:



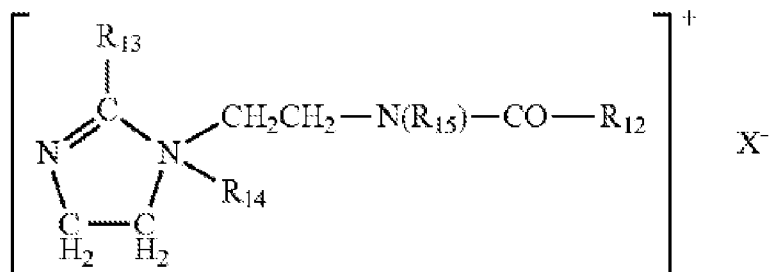
(III)

in which the groups R_8 to R_{11} , which may be identical or different, represent a linear or branched, saturated or unsaturated aliphatic group comprising from 1 to 30 carbon atoms, or an aromatic group such as aryl or alkylaryl, at least one of the groups R_8 to R_{11} denoting a group comprising from 8 to 30 carbon atoms and preferably from 12 to 24 carbon atoms. The aliphatic groups may comprise heteroatoms especially such as oxygen, nitrogen, sulfur and halogens. The aliphatic groups are chosen, for example, from C_1 - C_{30} alkyl, C_2 - C_{30} alkenyl, C_1 - C_{30} alkoxy, polyoxy(C_2 - C_6)alkylene, C_1 - C_{30} alkylamide, (C_{12} - C_{22})alkylamido(C_2 - C_6)alkyl, (C_{12} - C_{22})alkyl acetate and C_1 - C_{30} hydroxyalkyl groups; X is an anion chosen from the group of halides, phosphates, acetates, lactates, (C_1 - C_4)alkyl sulfates, and (C_1 - C_4)alkyl- or (C_1 - C_4)alkylarylsulfonates.

Among the quaternary ammonium salts of formula (III), those that are preferred are, on the one hand, tetraalkylammonium salts, for instance dialkyldimethylammonium or alkyltrimethylammonium salts in which the alkyl group contains approximately from 12 to 22 carbon atoms, in particular behenyltrimethylammonium, distearyldimethylammonium, cetyltrimethylammonium or benzyldimethylstearyl ammonium salts, or, on the other hand, oleocetyldimethylhydroxyethyl ammonium salts, palmitylamidopropyltrimethylammonium salts, stearamidopropyltrimethylammonium salts and stearamidopropyldimethylcetearyl ammonium salts.

In some cases it is useful to use salts such as the chloride salts of the following compounds:

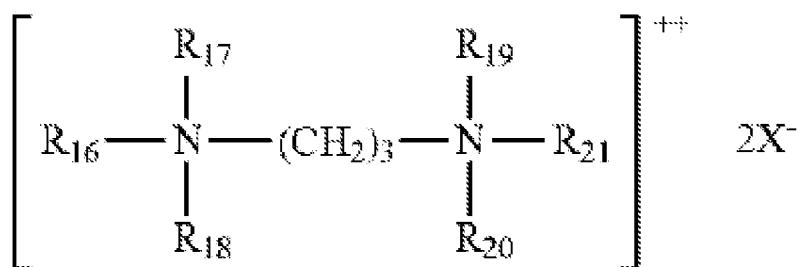
A. a quaternary ammonium salt of imidazoline, such as, for example, those of formula (IV) below:



(IV)

in which R₁₂ represents an alkenyl or alkyl group comprising from 8 to 30 carbon atoms, derived for example from tallow fatty acids, R₁₃ represents a hydrogen atom, a C₁-C₄ alkyl group or an alkyl or alkenyl group comprising from 8 to 30 carbon atoms, R₁₄ represents a C₁-C₄ alkyl group, R₁₅ represents a hydrogen atom or a C₁-C₄ alkyl group, X⁻ is an anion chosen from the group of halides, phosphates, acetates, lactates, alkyl sulfates, alkyl- or alkylaryl-sulfonates in which the alkyl and aryl groups preferably comprise, respectively, from 1 to 20 carbon atoms and from 6 to 30 carbon atoms. R₁₂ and R₁₃ preferably denote a mixture of alkenyl or alkyl groups containing from 12 to 21 carbon atoms, derived for example from tallow fatty acids, R₁₄ preferably denotes a methyl group, and R₁₅ preferably denotes a hydrogen atom. Such a product is sold, for example, under the name Rewoquat(R) W 75 by the company Rewo;

B. a quaternary diammonium or triammonium salt, in particular of formula (V):



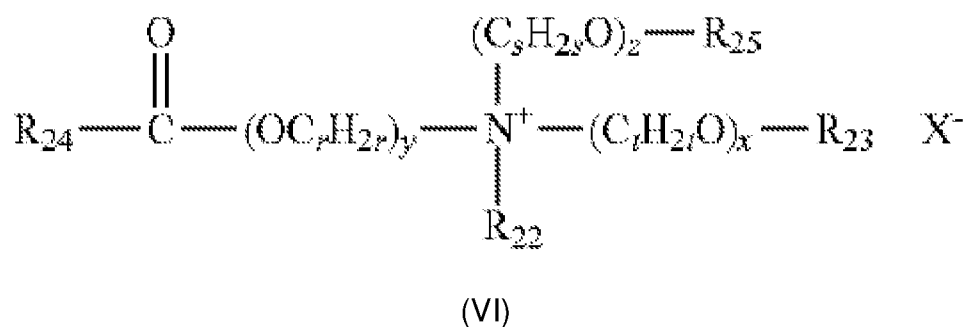
(V)

in which R₁₆ denotes an alkyl radical comprising approximately from 16 to 30 carbon atoms, which is optionally hydroxylated and/or interrupted with one or more oxygen atoms, R₁₇ is chosen from hydrogen or an alkyl radical comprising from 1 to 4 carbon atoms or a group (R_{16a})(R_{17a})(R_{18a})N-(CH₂)₃,

R_{16a}, R_{17a}, R_{18a}, R₁₈, R₁₉, R₂₀ and R₂₁, which may be identical or different, being chosen from hydrogen and an alkyl radical comprising from 1 to 4

carbon atoms, and X^- is an anion chosen from the group of halides, acetates, phosphates, nitrates and methyl sulfates. Such compounds are, for example, Finquat CT-P, sold by the company Finetex (Quaternium 89), and Finquat CT, sold by the company Finetex (Quaternium 75),

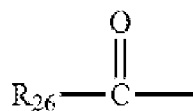
C. a quaternary ammonium salt containing at least one ester function, such as those of formula (VI) below:



in which:

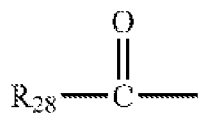
R_{22} is chosen from $\text{C}_1\text{-C}_6$ alkyl groups and $\text{C}_1\text{-C}_6$ hydroxyalkyl or dihydroxyalkyl groups;

R_{23} is chosen from:



R_{27} , which is a linear or branched, saturated or unsaturated $\text{C}_1\text{-C}_{22}$ hydrocarbon-based group, and a hydrogen atom,

R_{25} is chosen from:



R_{29} , which is a linear or branched, saturated or unsaturated $\text{C}_1\text{-C}_6$ hydrocarbon-based group, and a hydrogen atom,

R_{24} , R_{26} and R_{28} , which may be identical or different, are chosen from linear or branched, saturated or unsaturated $\text{C}_7\text{-C}_{21}$ hydrocarbon-based groups;

r , s and t , which may be identical or different, are integers ranging from 2 to 6;

y is an integer ranging from 1 to 10;

x and z , which may be identical or different, are integers ranging from 0 to 10;

X^- is a simple or complex, organic or mineral anion;

with the proviso that the sum $x+y+z$ is from 1 to 15, that when x is 0

then R_n denotes R_{27} , and that when z is 0 then R_{25} denotes R_{29} .

The alkyl groups R_{22} may be linear or branched, and more particularly linear. In some cases, R_{22} denotes a methyl, ethyl, hydroxyethyl or dihydroxypropyl group, and more particularly a methyl or ethyl group. Advantageously, the sum $x+y+z$ is from 1 to 10.

When R_{23} is a hydrocarbon-based group R_{27} , it may be long and contain from 12 to 22 carbon atoms, or may be short and contain from 1 to 3 carbon atoms. When R_{25} is an R_{29} hydrocarbon-based group, it preferably contains 1 to 3 carbon atoms. Advantageously, R_{24} , R_{26} and R_{28} , which may be identical or different, are chosen from linear or branched, saturated or unsaturated C_{11} - C_{21} hydrocarbon-based groups, and more particularly from linear or branched, saturated or unsaturated C_{11} - C_{21} alkyl and alkenyl groups.

In some cases, x and z , which may be identical or different, have values of 0 or 1. Likewise, in some cases y is equal to 1. In some cases, r , s and t , which may be identical or different, are equal to 2 or 3, and even more particularly are equal to 2.

The anion X^- may be a halide (chloride, bromide or iodide) or an alkyl sulfate, more particularly methyl sulfate. However, use may be made of methanesulfonate, phosphate, nitrate, tosylate, an anion derived from an organic acid, such as acetate or lactate, or any other anion compatible with the ammonium containing an ester function.

The anion X^- is even more particularly chloride or methyl sulfate.

Use is made more particularly, in the composition according to the invention, of the ammonium salts of formula (VI) in which:

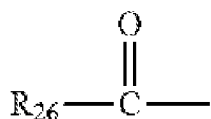
R_{22} denotes a methyl or ethyl group,

x and y are equal to 1;

z is equal to 0 or 1;

r , s and t are equal to 2;

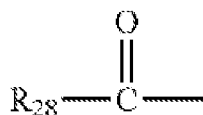
R_{23} is chosen from:



, methyl, ethyl or C_{14} - C_{22} hydrocarbon-based groups,

and a hydrogen atom;

R_{25} is chosen from:



and a hydrogen atom;

R₂₄, R₂₆ and R₂₈, which may be identical or different, are chosen from linear or branched, saturated or unsaturated C₁₃-C₁₇ hydrocarbon-based groups, and preferably from linear or branched, saturated or unsaturated C₁₃-C₁₇ alkyl and alkenyl groups. The hydrocarbon-based groups are advantageously linear.

Mention may be made, for example, of the compounds of formula (VI) such as the diacyloxyethyldimethylammonium, diacyloxyethylhydroxyethylmethylammonium, monoacyloxyethyldihydroxyethylmethyl ammonium, triacyloxyethylmethylammonium and monoacyloxyethylhydroxyethyldimethylammonium salts (chloride or methyl sulfate in particular), and mixtures thereof. The acyl groups preferably contain 14 to 18 carbon atoms and are obtained more particularly from a plant oil, such as palm oil or sunflower oil. When the compound contains several acyl groups, these groups may be identical or different.

These products are obtained, for example, by direct esterification of triethanolamine, triisopropanolamine, an alkyldiethanolamine or an alkyldiisopropanolamine, which are optionally oxyalkylenated, with C₁₀-C₃₀ fatty acids or with mixtures of C₁₀-C₃₀ fatty acids of plant or animal origin, or by transesterification of the methyl esters thereof. This esterification is followed by quaternization using an alkylating agent such as an alkyl (preferably methyl or ethyl) halide, a dialkyl (preferably methyl or ethyl) sulfate, methyl methanesulfonate, methyl para-toluenesulfonate, glycol chlorohydrin or glycerol chlorohydrin. Such compounds are, for example, sold under the names DEHYQUART by the company Henkel, STEPANQUAT by the company Stepan, Noxamium(R) by the company Ceca or REWOQUAT WE 18 by the company Rewo-Witco.

In some cases, the hair care compositions may further comprise additional ingredients such as nonionic surfactants, amphoteric or zwitterionic surfactants, preservatives, fragrances, pH adjusters, fillers, clays, pigments, and mixtures thereof.

Implementation of the present disclosure is provided by way of the following examples. The examples serve to illustrate the technology without being limiting in nature.

EXAMPLE 1
(FORMULATIONS)

Function	Ingredient	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	#14
High MP Wax	Ozokerite	2.5	7.5	8.7	2.5	7.5	-	10	2	2	-	-	-	-	-
High MP Wax	Carnauba Wax	3.5	-	4.8	3.5	-	10	3.8	2	2.5	2.5	2.5	2.5	2.5	5.0
Med. MP Wax	Beeswax	7	10	6	7	10	10	5.5	3	3	5	5	5	5	5
Low MP Wax	Myristyl Myristate	10	7.5	6.3	10	7.5	-	3.8	-	10	-	10	10	10	10
Low MP Wax	Murumuru Seed Butter	-	-	-	-	-	-	-	20	20	-	-	-	-	-
Ester Oil	Isopropyl Myristate	53.5	60.7	67.4	52.7	61.5	56.5	70.1	35.5	25.0	85.6	76.6	66.6	61.6	64.1
Vegetable Oil	Soybean oil	20	10	2.5	20	10	20	2.5	-	-	-	10	10	10	10
Vegetable Oil	Babassu oil	-	-	-	-	-	-	-	20	20	-	-	-	-	-
Silicone Oil	Dimethicone	-	-	-	-	-	-	-	10	10	-	-	-	-	-
Cationic Surfactant	Behen-trimonium Chloride	2.8	2.8	2.8	2.8	2.8	2.8	2.8	4.7	4.7	4.7	4.7	4.7	4.7	4.7
Non-Critical	Misc.	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3

The ingredients were combined and heated to a temperature of at least 85°C and then blended until homogenous. After the compositions were allowed to cool to room temperature (about 25°C), they had a consistency or a transforming texture ranging from that of dairy butter to a typical solid lipstick. The dropping point of these formulas ranged from about 60°C to about 80°C. When the compositions were rubbed between the hands, they easily melted and became nourishing, oily compositions that were easily applied onto hair.

EXAMPLE 2
(PERFORMANCE TESTING)

The compositions of Formulas 2, 3 and 4 were tested on the hair of 6

human volunteers (hair of the head). The compositions were applied to the hair and experts evaluated the hair at the following stages: (1) upon initial application to the hair; (2) while rinsing from the hair; (3) while the hair was still wet/damp immediately after rinsing; and (4) after the hair was dried. The experts evaluated the hair based on a scale of 0 (no influence) to 5 (extreme influence) with respect to a number of different properties. A positive result (a value greater than zero) indicated a beneficial effect for the property. An average score of 3 or higher was considered an exceptional result. When all three formulations scored a 3 or higher for a particular property, the effect was considered extremely significant and surprising. Although the three formulations provided many additional beneficial effects to the hair, only the most significant and surprising are reported in the table below.

Most Significant and Surprising Effects
Penetration upon application
Spreadability to hair tips upon application
Ease of detangling upon application
Maleability upon application
Softness upon application
Maleability during rinsing
Ease of detangling wet hair
Maleability while wet
Discipline of dry hair
Curl homogeneity of dry hair
Maleability of dry hair

EXAMPLE 3
(STABILITY TESTING)

The stability of the formulations presented in Example 1 was tested at room temperature (25°C), in the refrigerator (4°C), and in the oven (45°C). The samples were checked at 1 month and at 2 months for color changes and/or exudation (phase separation). If a color change was observed, an antioxidant was added to the formula in order to prevent color changes. However, if significant exudation (phase separation) was observed, the formulas were considered to be unstable. Formulations 1-7 were stable at both 1 month and 2 months at all three temperatures. At the highest temperature (45°C) a few formulations exhibited minor instability (oozing) but it readily disappeared when the formulations reached room

temperature. Formulations 8-14 were less stable. Some of Formulations 8-14 exhibited exudation at 1 month and the other exhibited exudation at 2 months.

The foregoing description illustrates and describes the disclosure. Additionally, the disclosure shows and describes only the preferred embodiments but, as mentioned above, it is to be understood that it is capable to use in various other combinations, modifications, and environments and is capable of changes or modifications within the scope of the invention concepts as expressed herein, commensurate with the above teachings and/or the skill or knowledge of the relevant art. The embodiments described herein above are further intended to explain best modes known by applicant and to enable others skilled in the art to utilize the disclosure in such, or other, embodiments and with the various modifications required by the particular applications or uses thereof. Accordingly, the description is not intended to limit the invention to the form disclosed herein. Also, it is intended to the appended claims be construed to include alternative embodiments.

As used herein, the terms "comprising," "having," and "including" are used in their open, non-limiting sense.

The terms "a," "an," and "the" are understood to encompass the plural as well as the singular.

The expression "one or more" means "at least one" and thus includes individual components as well as mixtures/combinations.

Other than in the operating examples, or where otherwise indicated, all numbers expressing quantities of ingredients and/or reaction conditions are to be understood as being modified in all instances by the term "about," meaning within +/- 5% of the indicated number.

All percentages, parts and ratios herein are based upon the total weight of the compositions of the present invention, unless otherwise indicated.

The term "stable" as used herein means that the composition does not exhibit phase separation and/or crystallization.

"Volatile", as used herein, means having a flash point of less than about 100°C.

"Non-volatile", as used herein, means having a flash point of greater than about 100°C.

As used herein, all ranges provided are meant to include every specific range within, and combination of sub ranges between, the given ranges. Thus, a

range from 1-5, includes specifically 1, 2, 3, 4 and 5, as well as sub ranges such as 2-5, 3-5, 2-3, 2-4, 1-4, etc.

Other than in the operating examples, or where otherwise indicated, all numbers expressing quantities of ingredients and/or reaction conditions are to be understood as being modified in all instances by the term “about,” meaning within +/- 5% of the indicated number.

The term “substantially free” or “essentially free” as used herein means that there is less than about 2% by weight of a specific material added to a composition, based on the total weight of the compositions. Nonetheless, the compositions may include less than about 1 wt.%, less than about 0.5 wt.%, less than about 0.1 wt.%, or none of the specified material.

All ranges and values disclosed herein are inclusive and combinable. For examples, any value or point described herein that falls within a range described herein can serve as a minimum or maximum value to derive a sub-range, etc.

All publications and patent applications cited in this specification are herein incorporated by reference, and for any and all purposes, as if each individual publication or patent application were specifically and individually indicated to be incorporated by reference. In the event of an inconsistency between the present disclosure and any publications or patent application incorporated herein by reference, the present disclosure controls.

SET OF CLAIMS

1. A hair care composition comprising:
 - a. a combination of waxes, the combination comprising:
 - i. one or more high melting point waxes having a melting point of about 71°C to about 90°C;
 - ii. one or more medium melting point waxes having a melting point of about 51°C to about 70°C; and
 - iii. optionally, one or more low melting point waxes having a melting point of about 31°C to about 50°C;
 - b. one or more oils that are liquids at a temperature at or below about 30°C; and
 - c. one or more cationic surfactants;wherein the dropping point of the composition is from about 60°C to about 80°C.
2. The hair care composition of claim 1, wherein all waxes in the combination of waxes are natural waxes and/or synthetic waxes.
3. The hair care composition of claim 1 or 2, wherein the one or more high melting point waxes are selected from the group consisting of linear polyethylene, microcrystalline petroleum wax, ozokerite, carnauba wax, castor wax, esparto wax, shellac wax, sugarcane wax, lignite wax, ouricouri wax, rice bran wax, castor wax, mortar wax, stearin, montan wax, sugar cane wax, rice bran wax, polyethylene wax, sunflower wax, and mixtures thereof.
4. The hair care composition of any one of the above claims, wherein the one or more medium melting point waxes are selected from the group consisting Japan wax, beeswax, ceresin wax, cocoa butter, ethylene glycol diesters or triesters of C₁₈-C₃₆ fatty acids, cetyl palmitate, glyceryl monostearate, jojoba wax, stearyl alcohol, silicone waxes, and combinations thereof, candelilla wax, stearyl stearate, jojoba esters, palm butter, and mixtures thereof.
5. The hair care composition of any one of the above claims comprising one or more low melting point waxes, wherein the one or more low melting point waxes are selected from the group consisting of bayberry wax, petrolatum, illipe butter, myristyl myristate, paraffin wax, hard tallow, lanolin, lanolin alcohol, cetyl alcohol, kokum butter, Sal butter, Shea butter, spermaceti, hydrogenated castor oil, murumuru seed butter (*Astrocaryum murumuru*), and

mixtures thereof.

6. The hair care composition of any one of the above claims comprising ozokerite as a high melting point wax.

7. The hair care composition of any one of the above claims comprising ozokerite and carnauba wax as high melting point waxes.

8. The hair care composition of any one of the above claims comprising beeswax, as a medium melting point wax.

9. The hair care composition of any one of the above claims comprising myristyl myristate as a low melting point wax.

10. The hair care composition of any one of the above claims comprising about 10 to about 50 wt.% of the combination of waxes, based on the total weight of the hair care composition.

11. The hair care composition of any one of the above claims comprising about 1 to about 25 wt.%, preferably about 5 to about 20 wt.%, more preferably, about 5 to about 15 wt.% of the high melting point waxes, based on the total weight of the hair care composition.

12. The hair care composition of any one of the above claims comprising about 1 to about 25 wt.%, preferably about 4 to about 20 wt.%, more preferably about 5 to about 15 wt.% of the one or more medium melting point waxes, based on the total weight of the hair care composition.

13. The hair care composition of any one of the above claims comprising about 1 to about 25 wt.%, preferably about 2 to about 15 wt.%, more preferably, about 5 to about 10 wt.% of the one or more low melting point waxes, based on the total weight of the hair care composition.

14. The hair care composition of any one of the above claims, wherein the one or more oils of (b) includes one or more ester oils.

15. The hair care composition of claim 14, wherein the one or more ester oils are esters of C₆₋₂₂ fatty acids with a monohydric alcohol and/or esters of C₆₋₂₂ fatty alcohols with a monocarboxylic acid.

16. The hair care composition of claim 15 comprising one or more esters of a fatty acid with a C₆₋₂₂ aliphatic alcohol.

17. The hair care composition of claim 15 comprising one or more esters of a fatty alcohol with a C₆₋₂₂ aliphatic monocarboxylic acid.

18. The hair care composition of claim 14, wherein the one or more

ester oils are selected from the group consisting of butyl isostearate, butyl oleate, butyl octyl oleate, cetyl palmitate, cetyl octanoate, cetyl laurate, cetyl lactate, cetyl isononanoate, cetyl stearate, diisostearyl fumarate, diisostearyl malate, neopentyl glycol dioctanoate, dibutyl sebacate, di-C₁₂₋₁₃ alkyl malate, dicetearyl dimer dilinoleate, dicetyl adipate, diisocetyl adipate, diisononyl adipate, diisopropyl dimerate, triisostearyl trilinoleate, octodecyl stearyl stearate, hexyl laurate, hexadecyl isostearate, hexydecyl laurate, hexyldecyl octanoate, hexyldecyl oleate, hexyldecyl palmitate, hexyldecyl stearate, isononyl isononanoate, isostearyl isononate, isohexyl neopentanoate, isohexadecyl stearate, isopropyl isostearate, n-propyl myristate, isopropyl myristate, n-propyl palmitate, isopropyl palmitate, hexacosanyl palmitate, lauryl lactate, octacosanyl palmitate, propylene glycol monolaurate, triacontanyl palmitate, dotriacontanyl palmitate, tetratriacontanyl palmitate, hexacosanyl stearate, octacosanyl stearate, triacontanyl stearate, dotriacontanyl stearate, stearyl lactate, stearyl octanoate, stearyl heptanoate, stearyl stearate, tetratriacontanyl stearate, triarachidin, tributyl citrate, triisostearyl citrate, tri-C₁₂₋₁₃-alkyl citrate, tricaprylin, tricaprylyl citrate, tridecyl behenate, trioctyldodecyl citrate, tridecyl cocoate, tridecyl isononanoate, glyceryl monoricinoleate, 2-octyldecyl palmitate, 2-octyldodecyl myristate or lactate, di(2-ethylhexyl)succinate, tocopheryl acetate, and mixtures thereof.

19. The hair care composition of claim 15 comprising about 30 to about 85 wt.% of the one or more ester oils.

20. The hair care composition of any one of the above claims, wherein the one or more oils of (b) includes one or more non-ester oils.

21. The hair care composition of any one of the above claims, wherein the one or more oils of (b) includes one or more vegetable oils.

22. The hair care composition of claim 21 comprising one or more vegetable oils selected from the group consisting of almond oil, babassu oil, castor oil, Clark A oil, coconut oil, corn oil, cotton seed oil, jojoba oil, linseed oil, mustard oil, olive oil, palm oil, peanut oil, safflower oil, sesame oil, soybean oil, sunflower-seed oil, wheat germ oil, and mixtures thereof.

23. The hair care composition of claim 21 comprising about 1 to about 40 wt.% of the one or more vegetable oils.

24. The hair care composition of any one of the above claims comprising both of one or more ester oils and one or more vegetable oils.

25. The hair care composition of claim 24 comprising about 50 to about 90 wt.% of the one or more ester oils and the one or more vegetable oils.

26. The hair care composition of any one of the above claims, wherein the one or more cationic surfactants of (c) are selected from the group consisting of optionally polyoxyalkylenated, primary, secondary and tertiary fatty amines and/or salts thereof.

27. The hair care composition of any one of the above claims, wherein the one or more cationic surfactants of (c) comprises one or more alkyl-quaternized ammonium salts.

28. The hair care composition of claim 27 comprising one or more alkyl-quaternized ammonium salt selected from the group consisting of Stearalkonium chloride, Cetrimonium chloride, cetrimonium bromide, behentrimonium methosulfate, behentrimonium chloride, benzalkonium chloride, cinnamidopropyltrimonium chloride, cocotrimonium chloride, dicetyldimonium chloride, dicocodimonium chloride, hydrogenated palm trimethylammonium chloride, lauryltrimonium chloride, quaternium-15, quaternium-22, and mixtures thereof.

29. The hair care composition of any one of the above claims comprising about 0.1 to about 10 wt.% of the one or more cationic surfactants of (c).

30. An essentially anhydrous hair care composition of any one of the above claims.

31. The hair care composition of any one of the above claims, wherein the hair care composition is free of anionic surfactants.

32. The hair care composition of any one of the above claims, wherein the hair care composition is essentially free of sulfate-containing surfactant.

33. The hair care composition of any one of the above claims, wherein the hair care composition is free of silicones.

34. An essentially anhydrous hair care composition comprising:

a. a combination of waxes, the combination comprising:

i. one or more high melting point waxes having a melting point of about 71°C to about 90°C;

ii. one or more medium melting point waxes having a melting point of about 51°C to about 70°C; and

iii. optionally, one or more low melting point waxes having a melting point of about 31°C to about 50°C;

b (i). about 30 to about 85 wt.% of one or more ester oils that are liquids at a temperature at or below about 30°C, wherein the one or more ester oils are esters of C₆₋₂₂ fatty acids with a monohydric alcohol and/or esters of C₆₋₂₂ fatty alcohols with a monocarboxylic acid;

b (ii) about 1 to about 40 wt.% of one or more vegetable oils that are liquid at a temperature at or below about 30°C; and

c. about 0.1 to about 10 wt.% of one or more alkyl-quaternized ammonium salts;

wherein the dropping point of the composition is from about 60°C to about 80°C.

35. A method for improving the appearance of hair comprising applying a hair care composition of any one of the above claims onto the hair.

36. A method for conditioning hair comprising applying a hair care composition of any one of claims 1-34 onto the hair.

37. A method for controlling hair frizz comprising applying a composition of any one of claims 1-34 onto the hair.

38. A method for making the hair care composition of any one of claims 1-34 comprising:

i. combining the mixture of waxes of (a), the one or more oils of (b), and the one or more cationic surfactants of (c);

ii. heating the combination to a temperature at or above 85°C; and

ii. blending the combination until uniform.

39. The method of claim 38, wherein blending the combination comprises homogenizing the combination.

INTERNATIONAL SEARCH REPORT

International application No
PCT/BR2016/050313

A. CLASSIFICATION OF SUBJECT MATTER		
INV.	A61K8/31 A61Q5/12	A61K8/37 A61K8/92
	A61K8/41 A61K8/02	A61Q5/00 A61Q5/06
ADD.		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) A61K A61Q		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPO-Internal, BIOSIS, CHEM ABS Data, COMPENDEX, EMBASE, EMBL, FSTA, INSPEC, IBM-TDB, WPI Data		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 413 416 A2 (COLGATE PALMOLIVE CO [US]) 20 February 1991 (1991-02-20)	1-5, 11-15, 17,18, 26,27, 29,35-39
Y	examples A,C -----	1-39
X	EP 0 471 606 A2 (COLGATE PALMOLIVE CO [US]) 19 February 1992 (1992-02-19) examples 23-30 ----- -/-	1-5,8, 11-13, 20, 26-29, 35-37
☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
* Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 1 February 2017		Date of mailing of the international search report 08/02/2017
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer Irwin, Lucy

INTERNATIONAL SEARCH REPORT

International application No

PCT/BR2016/050313

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 2013/082430 A1 (OREAL [FR]; SALESE MICHELLE [US]; MORRIS JOLENE [US]; ROGERS CHELSEA []) 6 June 2013 (2013-06-06) example 1 page 5, paragraph 2 page 6, line 5 - line 6 Illustrative Embodiments of the Invention; page 25	1-39
A	----- WO 03/037280 A1 (PROCTER & GAMBLE [US]) 8 May 2003 (2003-05-08) examples 1-5 Summary; page 2 Quaternary Ammonium Compound; page 4 Anhydrous Carrier; page 6 High Melting Point Fatty Compound; page 11	1-39
A	----- EP 2 166 022 A1 (Q P CORP [JP]) 24 March 2010 (2010-03-24) paragraph [0001] paragraph [0004] paragraph [0046] - paragraph [0052] examples	1-39
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