Abstract:

SOLID COMPOSITION FOR HAIR RESTYLING AND METHOD FOR USING IT

Title:

SOLID COMPOSITION FOR HAIR RESTYLING AND METHOD FOR USING IT

43) International Publication Date
10 December 2015 (10.12.2015)

(51) International Patent Classification:
A61Q 5/06 (2006.01)  A61K 8/81 (2006.01)

(21) International Application Number:
PCT/IB2015/054233

(22) International Filing Date:
4 June 2015 (04.06.2015)

(25) Filing Language:
Italian

(26) Publication Language:
English

(30) Priority Data:
MI2014A001037  6 June 2014 (06.06.2014)  IT

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Published:
with international search report (Art. 21(3))
The objects of the present invention are a solid composition and a method for hair restyling using such composition for lastingly fixed hairs in the shape given thereto, while substantially reducing the phenomena whereby hairs get sticky and adhere to the fingers of a hand, so as to make them insert in and pass through them, without significantly modifying the shape of hairs.

The hair shaping treatment (commonly referred to as "restyling") consists in temporarily modifying the original shape of hairs.

Whenever hairs are wet with water, the millions of hydrogen bonds that bind the chains of keratin of hairs to each other break. New bonds form again when water evaporates during their drying and this is the reason why it becomes possible to modify the shape of hairs by hot straightening or curling them, so that new hydrogen bonds form in the desired position, when hairs are cooled down.

However, as soon as hairs get wet or get in contact with humidity, then the hydrogen bonds break again and hairs go back to their original shape. One of the main purposes of the present invention is to make it possible to retain the desired shape of hairs lastingly, by using means and products that guarantee a good retention of the restyled shape, as well as to respect hair care and health, by preventing them from getting in contact with water.

As a matter of fact, there is a growing and growing request by the market and by the operators in this sector for products that make it possible to create hair styles that are new and stable over time, without modifying or weakening the structure of hairs.

Patent US2012/0204896 A1 describes the use of polymers (for
instance: polyacrylates, polyamides, polyesters, and others) for a lasting hair restyling: such polymers are dissolved in aqueous, alcoholic, or hydroalcoholic systems, in particular, compositions based on polyamides dissolved in aqueous, alcoholic, or hydroalcoholic systems which are spread on hairs in the form of gels or sprays.

In order to guarantee that the desired shape of hairs is retained for a long time, said compositions shall make it possible for the mentioned solvents to evaporate, so as to only leave a layer of polyamide adhered to every hair, in order for the shape of the hair to last over time. However, such treatment leaves hairs rigid, little elastic, and difficult to restyle.

The use of polyamides in the composition of hair products has also been described in patent GB1117129, wherein polyamides are partially dissolved in an oily non-polar solvent liquid having at least one 10-carbon-atom hydrocarbon chain. However these products (formulated in the form of an oily, transparent or opaque gel) notwithstanding they produce a good shaping effect, have a drawback in that they are very greasy and leave greasy residuals on hairs, which foster an undesired adhesion of hairs to each other.

Also, these products being in the form of an oily gel obliges users to spread the product by their own hands, whereby greasy and unpleasant residuals are left on their hands. Also, hairs remain greasy over time and little pleasant to touch.

U.S. patents US7253249 B2 and US20090074685 A1 describe compositions of cosmetic products in a non-aqueous solid form (and in particular in the form of sticks), containing at least one polyamide and at least one emollient. In such patents, the formulations are described only for being used in personal care, not for hair restyling. In fact, the use of
such compositions on hairs as they are would cause, besides a mild effect in retaining the shape given thereto when so treated, a drawback related to the presence of solid and visible gelatinized particles of product on the locks of hairs, resulting from the solid compositions rubbing on the rough surfaces of the individual hairs. The presence of residuals of such compositions is not experienced on the remaining surfaces of the human's body described in the mentioned patent documents, because they are surfaces that are all in all less rough than hairs.

According to the present invention, surprisingly it has been discovered that using compositions containing at least one polyamide and at least one emollient on hairs, applied at the ambient temperature on hairs in a (preferably transparent or translucent) solid form, followed by the application of a heating source to heat both hairs and the composition applied thereon, makes it possible an easy shaping of hairs in the most different ways and hairs are stabilized by a subsequent cooling down of themselves.

The possibility of obtaining solid sticks through the use of oil gelatinizing agents is known, as described in patent 0074685 which describes the use of sticks formed of at least one polyamide and at least one emollient to obtain lip glosses, lip sticks, hydrating sticks for lips, deodorant sticks, antiperspirant sticks, sun protection sticks, sunning lotion sticks, sticks used in pharmaceutical products, soap sticks, perfume sticks, insect-repellent sticks.

An object of the present invention is a solid cosmetic composition for hairs, preferably featuring a translucent or transparent appearance, based on at least one polyamide and at least one emollient, which is used as a hair restyler, through the use of heat (obtained via heating means, including, for instance blow-dryers, hot plates, curling
tongs commonly used in hair treatment), followed by a cooling-down to a substantially ambient temperature, with or without the use of cooling instruments, during which hairs are held-set until the cooling down step is over. Surprisingly the use of such solid composition according to the mentioned application mode makes and lastingly holds hairs perfectly shaped, very little or absolutely not greasy, not sticky and separated from each other, but rather light and lucent. Whenever such composition is spread on hairs, heated, shaped, and then cooled down, a stable and simultaneously elastic restyling isobtained, hairs being not sticky or adhesive to each other, to such an extent that passing the fingers of a hand therebetween is neither hindered nor does it significantly modify the restyled shape of hairs.

Another object of the present invention is a method for using the mentioned solid cosmetic composition for hairs, preferably featuring a translucent or transparent appearance (based on at least one polyamide and at least one emollient), such composition being suitable for comprising at least one cosmetic ingredient including (for illustrative not exhaustive purposes) an active principle, a color agent, a pearling agent or a glitter. Therefore, the present invention refers both to cosmetic compositions consisting of at least one polyamide selected among those defined as polyamide-3 and/or Polyamide-8 according to the combined nomenclature (CN) and of at least one emollient suitable for making it possible the formation of preferably translucent or transparent solid products to be used in the hair beauty field and in the hair restyling sector, as well as a method for using such compositions for hair restyling through use of the compositions themselves.

The field of application of the present invention concerns
the use of cosmetic products dedicated to hairs, including shaping, styling, maintaining the hair style, hair wellness and (colored or not colored) hair beauty treatment.

The compositions of the present invention can be used for all types of hairs (including long, short, curly, smooth, wavy, ethnic, clear, dark, tinted, etc. hairs).

As far as composition is concerned, all polyamides known in the state of the art can be used for developing a solid stick for hairs.

Non exhaustive examples of commercial products that can be used as polyamides in the applications of the present invention include polymers of the OleoCraft line (OleoCraft LP-20; OleoCraft MP-30; OleoCraft HP-31; OleoCraft MP-32) from Croda Europe.

Emollients that can be used in the compositions according to the present invention are preferably selected in the group comprising hydrocarbons, esters featuring a number of at least 8 carbon atoms, glycerol and polyglycerol, glycols and polyglycols and by-products thereof, vegetal oils, siliconic oils, fat alcohols, fat acids, and by-products thereof etoxilates and/or propoxilates.

The compositions can comprise even more than one emollient and/or more than one polyamide.

The concentration of polyamides in the compositions according to the present invention can range from 5 to 70, the numeric values here indicated being in percentage on the weight of the compositions themselves.

The polyamide-to-emollient ratio can range from 1:19 to 19:1; preferably from 1:4 to 4:1 and more preferably from 1:2 to 2:1.

The compositions described above form a solid compound (which possibly features a translucent or transparent appearance) which can be applied onto the locks of hairs to make it
possible for hairs to be shaped and remain such over time. However, a simple mechanical application of the compositions on hairs causes the formation of solid and visible residuals of the compositions on the treated locks of hairs. Even in the case of more rigid and structured formulations of such compositions, the mechanical friction due to the compositions themselves rubbing with the keratinous surface of hairs tends to crumble the surface of the stick obtained by using such compositions and to generate small solid fragments or clots which remain on the outer surface of hairs. A simple application of a stick realized with a composition according to the present invention leads in any case to a moderate hair shaping effect.

The method also forming an object of the present invention surprisingly allows to shape and reshape hairs or a lock of hairs on which a composition according to the present invention has already been cold applied (usually at the ambient temperature), the method comprising heating the lock of hairs by using means that supply heat from the outside, non limiting examples of which include blow-dryers, hot plates, curling tongs, heating brushes or curlers, hair dryers, air diffusers, heating rollers, etc. and which usually reach temperatures of up to 230° C (or more) without damaging hairs featuring a more robust structure (for instance, "ethnic" hairs). The moderately high temperatures of these instruments make it possible for the composition according to the present invention to make hairs more shapeable and simultaneously to make the solid residuals of the product of the composition present on hairs disappear, whereas a subsequent cooling down (hairs being held set at the ambient temperature) fixes the hair setting, whereby hairs become bright and the shape of hairs is retained, while preventing the sticky and waxy effect typical of sticks
obtained with other formulations including, for instance, the wax-based ones and those based on other solid lipids. Surprisingly it is noted that the styling properties of the compositions according to the present invention don't entail any excessive and unpleasant heaviness of the treated hairs, but rather they retain softness and lightness aspects that are unusual after using a solid stick for hairs. As a matter of fact, at the end of a restyling, the lock of hairs makes it possible to pass the teeth of a comb or the fingers between the hairs, without substantially modifying the shape of the previously shaped lock too much: this aspect is considered to be particularly important and novel in the styling field and in the use of solid restylers. The lock heating temperature ranges from 40°C to 230°C, and more preferably from 65°C to 180°C. According to the present invention, it has also been ascertained how the effect whereby the shape is retained over time, after heating, improves after cooling the treated lock down to the ambient temperature; such cooling down can be obtained either by leaving the lock of hairs dry at the air, or by using cooling systems to force such a drying; in the latter case, styling is found to be faster and more effective.

The composition according to the present invention can, if desired, also contain one or several components and additives as generally used in the cosmetics sector. Non exhaustive examples of additives that can be added to the formulations are colored pigments, cosmetic active principles, coloring agents, perfumes, active ingredients capable of absorbing ultraviolet rays, pearling agents, glitters, etc.. The presence of active cosmetic ingredients in the composition used according to the above described modes does not alter the hair restyling capabilities, but rather it
retains them, by associating the possibility of performing a colored aesthetical treatment on the external surface of hairs.

The compositions described above make it possible to prepare solid compounds, implemented in the form of a solid and compact stick which possibly features a translucent or transparent appearance, more preferably a transparent one: the transparency requirement is often the most wanted by consumers.

As much inviting are in particular those products which contain a coloring agent, a pigment, or a curling agent, which means that a transparent base makes it possible to improve the appearance of the product by itself and to exploit coloring, pigmentation, or the pearled visual effect of hair in the best possible way.

A further advantage of the composition according to this invention is that it allows to prepare and distribute a solid compound, developed in the form of a solid stick, such as to allow the use of such compound, the latter not getting in contact with hands. This aspect is particularly worth whenever the composition is colored, pigmented, or enriched with pearls or glitters.

In order to make the characteristics of the compositions and of the method of their use for hair restyling according to the present invention more understandable, a number of non-exhaustive embodiments will be now described.

**Example 1**

In a plant provided with a stirrer emollient oils containing 30 parts of Crodamol STS (EU INCI name: "PPG 3 Benzyl Ether Myristate") and 14 parts of Schercemol Co Cetyl Octanoate (EU INCI name: "Cetyl Ethylhexanoate ") are first of all loaded, the mix of such oils is heated up to a temperature of 102°C/105°C, the mix being stirred by blades. While the mix
is heated, a mix of polyamides consisting of 18 parts of Oleocraft LP20 (EU INCI name: "Polyamide 8") and 28 parts of Oleocraft MP-32 (EU INCI name: "Polyamide 3") is loaded in the plant, the indicated parts being referred to the total weight of the composition obtained at the end of the treatment in the plant wherein the mix is stirred by blades up to obtaining a homogeneous composition. Finally a check is made to see whether the gelatinizing agents have been completely dissolved in the oils. The product thus obtained is a colorless to slightly pale yellow, perfectly transparent liquid. The temperature is cooled down to 87°C and such product is unloaded by pouring it into a stick container. Then the product is made cool down in a refrigerator at a temperature of 4°C up to its complete solidification. The thus prepared composition is applied to the root of the hair while letting it dry in the open air. A good shaping effect is obtained according to what desired, even by just using hands (even though the presence of white residuals on hairs can be noted if applying the composition in this way). Then, at a later time, the zone under examination is heated up to a temperature of approximately 90°C by using a blow-dryer: it is surprisingly noted that residuals disappear and hairs are easily combable. Following a natural cooling-down (at the air) of the lock set in place by a brush, it can be noted that the shape is retained even after removing the brush.

Example 2
According to the same procedure as described for Example 1, 30% of Crodamol STS, 8% of Schercemol Co Cetyl Octanoate, 42% of Oleocraft LP20 and 20% of Oleocraft MP-32 are loaded, these percentages being percentages in weight referred to the total weight of the composition.
The thus prepared composition is applied from the root to the tip of the hairs and treated by using means that supply heat from the external world, for instance a hot plate, up to reaching a temperature of approximately 180°C. Then the hot plate is removed (hairs being set by a brush) and a cooling-down is forced by using the cold air from a blow-dryer, down to the ambient temperature. In this case, the air shaping effect results to be simpler and faster.

**Example 3**

Still according to the procedure as described for Example 1, 18% of Oleocraft LP20, 18% of Oleocraft MP32, 12% of Cetiol CC (EU INCI name "Dicaprylyl carbonate"), 47% of Crodamol STS and 5% of Argan Oil (EU INCI name: Argania Spinosa Kermel Oil) are loaded in the plant according to the modes described for Example 1, the latter compound being added last so as to prevent any degradation and/or yellowing problems, the percentages being in weight as referred to the total weight. After this addition, the temperature is cooled down to the pouring temperature, and the product is poured into a stick container. Then it is let cool in a refrigerator down to a complete solidification.

In this event, the composition turns out to be solid, but easily malleable, which allows to use lower temperatures, around 50°C, for the subsequent hair heating step, while obtaining a good hair shaping effect after a natural cooling down in any case. Hairs get and retain the shape given thereto while remaining soft and lucent.

**Example 4**

Still according to the operating modes described in Example 1, 18% of Oleocraft LP20, 18% of Oleocraft MP32, 12% of Cetiol CC, 46.50% of Crodamol STS, 5% of Arganoil, and 0.50% of Timica Silver Sparkle 5500 (i.e. Mica-CI 77891) are loaded in a plant provided with a blade stirrer, the latter
mentioned component operating as a pearlant agent, which is added at the end of the preparation upon reaching the pouring temperature, the indicated percentages being in weight: after this addition, the mix is stirred by blades for few minutes to make a correct homogenization take place. Subsequently such mix is unloaded by pouring it into a stick container. As with the remaining explanatory cases described above, the stick is let cool in a refrigerator down to a complete solidification.

The composition is applied to every lock of hairs all along the length of the hair which is subsequently heated up by means of a blow-dryer. Then hairs are shaped by means of hands and a blow-dryer at a temperature of 45°C and subsequently cooled down to the ambient temperature.

This treatment provides an optimum shapeability and a good setting over time. Hairs are shaped without any difficulties and retain their natural softness and offer visible silvery reflects between the individual locks.

**Example 5**

Still using a method similar to that described in Example 3, a composition is prepared comprising 8% of Oleocraft LP20, 8% of Oleocraft MP32, 27% of Cetiol CC (Dicaprylyl Carbonate), 47% of Crodamol STS, 5% of hydroxystearic acid, and 5% of Argan Oil, all percentages being in weight.

This composition is less compact and structured with respect to those described above; also, the composition as a whole is translucent and more malleable and more easily applicable to the base of hairs.

In this case too, a heating made by a blow-dryer improves the hair setting capabilities over time, even though a little milder than the previous ones in this case, but it allows to hold hairs soft and elastic.
1. A cosmetic composition for setting hairs to a restyled form, comprising:
   - at least one polyamide selected among those called Polyamide-3 and Polyamide-8 according to the INCI nomenclature, and
   - at least one emollient selected in the group comprising hydrocarbons, esters with at least eight carbon atoms, glycerol, polyglycerol, glycols, and polyglycols and by-products thereof, vegetal oils, siliconic oils, fat alcohols, and fat acids,
   characterized in that said composition is in a solid form wherein the weight of the polyamide ranges from 5% to 70% of the total weight of the composition and the polyamide to emollient ratio ranges from 1:19 to 19:1 in weight.

2. A cosmetic composition according to claim 1, characterized in that it is translucent or transparent.

3. A cosmetic composition according to claims 1 and 2, characterized in that such composition also comprises at least one cosmetic ingredient.

4. A composition according to any of the previous claims, characterized in that said polyamide to emollient ratio ranges from 1:4 to 4:1 in weight.

5. A composition according to claim 4, characterized in that said polyamide to emollient ratio ranges from 1:2 to 2:1 in weight.

6. A method for hair restyling by using a cosmetic composition according to claims 1 thru 5, characterized in that said composition is first spread on hairs at a substantially ambient temperature, then heated up to a temperature ranging from 40°C to 230°C, and finally cooled down to the ambient temperature.

7. A method for hair restyling according to claim 6,
characterized in that said composition is heated up to a temperature ranging from 65° to 180°C.
**INTERNATIONAL SEARCH REPORT**

**A. CLASSIFICATION OF SUBJECT MATTER**

INV. A61Q5/Q8 A61K9/81

**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, WPI Data

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:
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Date of the actual completion of the international search: 3 September 2015

Date of mailing of the international search report: 11/09/2015

Named 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: Kling, Isabelle
**INTERNATIONAL SEARCH REPORT**

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