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(54) **Hair cosmetic compositions**

(57) A hair cosmetic composition comprises xanthan gum and/or tarracand gum, as well as an oxidizing agent. When the coposition is made into, such as, a permanent wave second

agent, permanent hair dye agent or a hair bleaching agent, xanthan gum and/or tarracand gum are effective in thickening the agents to prevent the running-down of the liquid agent in use, thus successful in protecting the skin from the liquid.

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## SPECIFICATION

### Hair cosmetic composition.

#### i) Field of the Invention:

This invention relates to a hair cosmetic composition, and more specifically to a hair cosmetic composition containing an oxidizing agent as a chief ingredient thereof, such as a permanent wave second agent, permanent hair dye agent, hair bleaching agent or the like which is ready to use owing to the prevention of running-down and shows excellent oxidizing effect, etc.

#### ii) Description of the Prior Art:

In the permanent hair-waving process which is applied to impart desired waves to hair, "S—S" bonds present in hair are subjected to reductive cleavage by using a permanent wave first agent (hereinafter called "a first agent") which contains a reducing agent such as thioglycollic acid, cysteine or the like as its chief ingredient and the thus-cut "S—S" bonds are then subjected to oxidative chain closure with a permanent wave second agent (hereinafter called "a second agent") which contains an oxidizing agent such as a bromate, perborate, hydrogen peroxide or the like as its chief ingredient.

In the permanent dyeing process which is applied to impart a desired color tone to hair, melanine present in hair is decolorized and an oxidation color is at the same time polymerized in the hair so as to dye the hair, using a liquid formulation prepared by mixing a second liquid which contains hydrogen peroxide as an oxidizing agent as its chief ingredient, and a first liquid which contains the oxidation color as its chief ingredient.

In a hair cosmetic composition making use of such an oxidizing agent as its chief ingredient, a variety of techniques and knowledge has been incorporated in order to draw out the neutralizing and oxidizing effects of a reducing agent used as a first agent to its maximum extent. Such as hair cosmetic composition also contains various chemical ingredients. Thus, it is desired for safety precaution to avoid the contact of the hair cosmetic composition to skin as much as possible.

For this purpose, it is generally practiced, when applying the permanent hair-waving process, to use a towel to absorb permanent wave agents which have run down from the hair, or to apply a cream to sensitive parts of skin. Some attempts have been made in recent years to prevent permanent wave agents from running down by making the permanent wave agents viscous. In first agents which may be rendered thicker or viscous rather easily, there have been employed cellulose-type, vinyl-type and acrylic-type thickening agents. Second agents have however not been rendered viscous or thicker with such thickening agent stably, because a cellulose-type or vinyl-type thickening agent, both of which being commonly incorporated in hair cosmetic compositions, is susceptible of undergoing salting-out or oxidative decomposition, since the second agents are each a solution which contains as its chief ingredient a salt such as bromate or perborate at a high concentration, i.e., in an amount of 4—10%, or a solution of an oxidizing agent such as hydrogen peroxide.

On the other hand, hair cosmetic compositions containing oxidizing agents, such as the second liquids of hair dye agents and hair bleaching agents are also accompanied by a problem similar to that mentioned above. There is thus a strong outstanding demand for the development of a prompt solution to the above problem.

#### 40 SUMMARY OF THE INVENTION

The present inventors have found, as a result of an extensive investigation on the thickening of hair cosmetic compositions containing an oxidizing agent as a chief ingredient thereof, that such hair cosmetic compositions may be successfully thickened with stability by using one or more of some specific thickening agents, thereby leading to completion of this invention.

Accordingly, the present invention provides a hair cosmetic composition, which comprises xanthan gum and/or tarracand gum as well as an oxidizing agent and does not run down in the course of its application to hair.

#### DETAILED DESCRIPTION OF THE INVENTION AND PREFERRED EMBODIMENTS

There is no particular limitation to the type of oxidizing agent to be employed in the present invention. Any oxidizing agent may be used so long as it is usable in hair cosmetic compositions. As illustrative oxidizing agents, may be mentioned hydrogen peroxide, alkali metal bromate, sodium perborate, urea peroxide, sodium percarbonate, sodium peroxytripolyphosphate, sodium peroxypropylphosphate, sodium peroxyorthophosphate, sodium silicate/hydrogen peroxide addition products, sodium sulphate/sodium chloride/hydrogen peroxide addition products, etc. Among such oxidizing agents, hydrogen peroxide and alkali metal bromates are preferred.

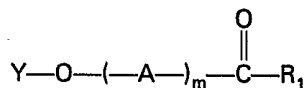
When preparing a hair cosmetic composition according to this invention, it is preferred to incorporate, in the hair cosmetic composition, 1—10 wt.% (all designations of "%" will hereinafter mean wt.%) or preferably 4—6% of an oxidizing agent and 0.1—5.0% (preferably 0.2—0.5% where the hair cosmetic composition is a permanent wave second agent, 1.0—3.0% where the hair cosmetic composition is a permanent dye second agent or a hair bleaching agent) of xanthan gum and/or tarracand gum. The above hair cosmetic composition may first be prepared as thick dilutable liquid

formulation, which is suitably diluted with water upon its application to hair.

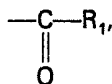
The hair cosmetic composition according to this invention may contain a pearling agent if necessary, besides the above-mentioned essential ingredients. It has heretofore been unable to thicken with stability cosmetic compositions containing an oxidizing agent and/or salt at high concentrations.

5 Hence, it has heretofore been unable to incorporate such a pearling agent stably in such hair cosmetic compositions. This invention makes possible a stable incorporation of the pearling agent into the hair cosmetic compositions. 5

As pearling agents usable in the present invention, there may be mentioned by way of example natural glitters such as ground fish scale powder and mica as well as the glycol esters of fatty acids 10 represented by the following general formula: 10



wherein  $R_1$  is a straight-chain or branched, saturated or unsaturated, hydrocarbon group containing 13—21 carbon atoms, Y is a hydrogen atom or



15 A means an ethylene oxide group or propylene oxide group, and  $m$  stands for an integer of 1—3 and indicates the average mole number of addition. Among such glycol esters, those containing an ethylene oxide group, essentially ethylene glycol monofatty acid ester is suitable. It is preferred to incorporate such a pearling agent in such an amount that it accounts for 0.1—10%, or preferably 0.5—5.0%. 15

20 Besides the above-mentioned ingredients, it is possible to incorporate, in the hair cosmetic composition according to this invention, optional ingredients such as surfactant, cationic high molecular compound, water-soluble silicone, urea, suitable oil-base softening agent, wetting agent, perfume base and/or pearl-like hue-imparting colorant, individually in an amount not impairing the effects of this invention. 20

25 Among these optional ingredients, may be mentioned as cationic high molecular compounds cationic cellulose derivatives, cationic starches, diallyl quaternary ammonium salts, copolymers of diallyl quaternary ammonium salts and acrylic amides, polyglycol/polyamine condensation products, methacryloxyethyl trimethyl ammonium, copolymers of methacryloxyethyl trimethyl ammonium and polyvinylpyrrolidone, etc. Among such cationic high molecular compounds, cationic celluloses represented by "POLYMER—JR" (trade name), diallyl quaternary ammonium salts led by "MERCOAT 100" (trade name) and diallyl quaternary ammonium salt/acrylic amide copolymers typified by "MERCOAT 550" (trade name) are particularly effective. Such a cationic high molecular compound may be added in an amount of preferably 0.01—5% or most preferably 0.05—2%. 30

In addition, an anionic, cationic, amphoteric or nonionic surfactant may be chosen as desired for incorporation in the hair cosmetic composition of this invention. 35

The thus-prepared hair cosmetic composition is then adjusted to a pH level of 9 or lower, preferably in the range of 3.0—7.0. 35

The invention will hereinafter be described by Examples. It should however be borne in mind that the present invention is not limited to or by the following Examples.

#### EXAMPLE 1

40 Permanent wave second agents of the following formulation were prepared each by incorporating 0.5% of each of various thickening agents. The miscibility of each thickening agent with its corresponding hair cosmetic composition and the structural viscosity of the resultant thickened hair cosmetic composition were investigated. Results are summarized in Table 1. 40

#### [Formulation for Second Agent]

45	Sodium bromate	4.0 (%)	45
	Amopholytic surfactant ("MILANOL C <sub>2</sub> M—SF"; product of Milanol Corporation)	0.5	
50	Cationic cellulose (POLYMER JR 400"; product of Union Carbide Corporation)	0.5	50

Thickening agent (see Table 1)	0.5
Citric acid (for pH adjustment)	as needed to adjust the pH of the formulation to 7.0
Water	balance

TABLE 1

Thickening agent	Miscibility	Structural viscosity
Ethylcellulose	○	X
Carboxyethylcellulose	○	X
Hydroxyethylcellulose	○	X
Polyvinyl alcohol	X	X
Polyvinyl pyrrolidone	X	X
Sodium polyacrylate	X	X
Carboxyvinyl polymer	X	X
Locust bean gum	○	X
Guar gum	○	X
Tarracand gum	○	○
Xanthan gum	○	○

## EXAMPLE 2

In accordance with the usual permanent-waving procedure, each permanent wave second agent of the following formulation was applied to hair in a volume of 100 ml and the extent of its running-down was investigated. Results are given in Table 2.

10	[Formulation for Second Agent]		10
	Sodium bromate	4.0 (%)	
	Anionic surfactant ("LAMEPON S"; product of Gruneav Corporation)	5.0	
15	Cationic polymer ("MARCOAT 550"; product of Merck & Co., Inc.)	0.5	15
	Pearling agent (Propylene glycol monostearate)	1.0	
20	Xanthan gum	0—0.5 (see, Table 2)	20
	Perfume base	trace	
	Ion-exchanged water	balance (pH 7.0)	

## [Evaluation Procedure]

After treating hair with a permanent wave first agent, the hair was rinsed with running water and then wiped by towels until no water dripped down from the hair. Then, a fresh towel the weight of which had beforehand been measured was applied around the neck and 100 ml of the second agent was applied to the hair. Upon an elapsed time of 15 minutes, the amount of the second agent which had run down and absorbed into the towel by that time was measured.

## [Evaluation Standard]

		Volume of run-down second agent	
10	⊙	20 ml or less	10
	○	21—40 ml	
	△	41—80 ml	
	X	81 or more	

TABLE 2

Amount of incorporated xanthan gum (wt.%)	Extent of running-down
0	X
0.1	△
0.2	○
0.3	⊙
0.4	⊙
0.5	⊙

## 15 EXAMPLE 3 15

In accordance with the usual permanent-waving procedure, each permanent wave second agent of the following formulation was applied. The feeling of hair to touch at the time of its rinsing was investigated. Results are given in Table 3.

## [Formulation for Second Agent]

20	Hydrogen peroxide	3.0 (%)	20
	"FROST DS"	0.5	
	Xanthan gum	0 or 0.3 (see, Table 3)	
	Pearling agent (propylene glycol monostearate)	0 or 10 (see, Table 3)	
25	Phosphoric acid (for pH adjustment)	as needed to adjust the pH to 3.5	25
	Ion-exchanged water	balance	

## [Evaluation Procedure]

The readiness of hair handling after removal of hair curlers and the feeling of hair to touch were ranked by a beautician.

30 30

[Evaluation Standard]

⊙ Excellent

○ Good

△ Fair

X Bad

5

5

TABLE 3

Xanthan gum (%)	Pearling agent (%)	Ranking of feeling to touch	
		After removal of hair curlers	During rinsing
0	0	X	X
0	10	⊙	△
0.3	0	○	△
0.3	10	⊙	⊙

The compositions according to this invention did not develop separation of the peeling agent and remained stable over a long time period.

**EXAMPLE 4**

10 Using permanent hair dye agents each of the following formulation, the extents of their running-down upon their applications were investigated. Results are given in Table 4. 10

[Formulation for Permanent Dye First Agent]

	Paraphenylene diamine	3.0 (%)	
	Resorcine	0.5	
15	Non-ionic surfactant ("Tween 80"; product of Kao Atlas Corporation)	10.0	15
	Sodium sulfite	0.5	
	Propylene glycol	10.0	
20	Isopropanol amine	10.0	20
	Aqueous ammonia solution (28%) (for pH adjustment)	as need to adjust the pH to 10.0	
	Ion-exchanged water	balance	

[Formulation for Permanent Dye Second Agent]

25	Hydrogen peroxide (35%)	17.0 (%)	25
	Xanthan gum	0—3.0 (see, Table 4)	
	Phosphoric acid (for pH adjustment)	as needed to adjust the pH to 3.5	
	Ion-exchanged water	balance	

## [Evaluation Procedure]

The permanent dye first agent and each of the permanent dye second agent were combined at the ratio of 1:1. Two hundred milliliters of the resultant permanent dye composition were applied to hair. The extent of its running-down was investigated.

## 5 [Evaluation Standard]

5

- No running-down.  
 △ Mild running-down.  
 X Severe running-down.

TABLE 4

Xanthan gum (%)	Running-down
0	X
0.5	△
1.0	○
3.0	○

## 10 CLAIMS

10

1. A hair cosmetic composition which comprises xanthan gum and/or tarracand gum as well as an oxidizing agent.

2. A composition as claimed in claim 1 wherein the proportion of oxidising agent is 1% to 10% by weight.

15 3. A composition as claimed in claim 1 or claim 2 wherein the proportion of oxidising agent is 4% to 6% by weight. 15

4. A composition as claimed in any preceding claim wherein the proportion of xanthan gum and/or tarracand gum is 0.1% to 5.0% by weight.

20 5. A composition as claimed in any preceding claim wherein the proportion of xanthan gum and/or tarracand gum is 0.2% to 0.5% by weight. 20

6. A composition as claimed in any preceding claim wherein the proportion of xanthan gum and/or tarracand gum is 1.0% to 3.0% by weight.

7. A composition as claimed in any preceding claim constituted as a thick dilutable liquid formulation adapted to be diluted with water prior to use.

25 8. A composition as claimed in any preceding claim including a proportion of a pearling agent. 25

9. A composition as claimed in any preceding claim including a proportion of one or more of surfactants cationic high molecular compounds, water soluble silicones, urea, oil based softening agents, wetting agents, perfum base, and pearl-like hue-importing colourant.

10. A composition as claimed in any preceding claim having a pH in the range 3.0 to 7.0.

30 11. A composition as claimed in claim 1 and substantially as described in any one of the specific examples hereinbefore set forth. 30

12. Each novel embodiment herein set forth either separately or in combination.