United States Patent Office 3,582,259 Patented June 1, 1971

3,582,259

METHOD OF TREATING HAIR TO IMPROVE QUALITY AND "HOLD" OF "SETS" IMPARTED THERETO

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No Drawing. Filed Jan. 5, 1967, Ser. No. 607,372
Claims priority, application Luxembourg, Jan. 7, 1966, 50,215
Int. Cl. A61k *7/10, 13/00;* D06m *3/00*
U.S. Cl. 8—127.51 8 Claims

ABSTRACT OF THE DISCLOSURE

A method of improving the quality and "hold" of a "set" imparted to the hair, which method comprises the steps of applying a reducing agent to said hair while it is moist and unconstrained, and then neutralizing it, said steps being carried out before the hair is "set."

BACKGROUND OF THE INVENTION

There is a conventional method of treating the hair known as "setting the hair" which consists essentially of rolling locks of hair which have been moistened with a "setting lotion" up on curlers (which are ordinarily 15–20 mm. in diameter), drying the hair while still on the curlers, removing the curlers and then combing out the hair.

Coiffures produced in this manner do not last very long and are especially sensitive to humidity. It has therefore been heretofore suggested that various special ingredients, such as resins or polymers, be included in the setting lotion, which special ingredients remain as a coating on the hair after it has been dried and serve to prolong the life of the "set."

SUMMARY

The present invention relates to a new process for substantially prolonging the life and improving the quality of a hair "set" which, instead of utilizing resins added to the setting lotion, relies on the steps of first treating the hair with a reducing agent, while the hair is moist and unconstrained, and then neutralizing the reducing agent, *before the hair is set.*

Neutralization may be accomplished by subsequently applying conventional neutralizing agents as a separate step in the pretreatment process, by including neutralizing agents in the setting lotion used to subsequently set the hair, or by including in either the setting lotion or the composition containing the reducing agent, a catalyst which accelerates neutralization by the oxygen in the ambient air.

The effects of this novel pre-treatment last longer than the first "set," which may be imparted to the hair immediately after the pre-treatment or after an intermediate delay, and continue to be observed as the hair is set several successive times.

This pre-treatment improves the "hold" and quality of the "sets" regardless of the manner in which the hair is subsequently set and regardless of the ingredients used in the setting lotion.

SPECIFICATION

In order to carry out the present invention, a composition containing an agent capable of reducing the S—S bonds of the keratin, such as one of those used in the first step of conventional permanent waving, is applied to moist hair which has first been washed, and left in contact therewith for a time sufficient to permit the agent to act, e.g., from 5 to 20 minutes. The hair is then rinsed,

and neutralized with an agent such as one of the agents customarily used in the second, or "neutralizing" step in a conventional permanent waving process.

It will be seen that the pre-treatment process according to the invention is essentially distinguished from a conventional permanent waving process firstly by the fact that the hair is treated with the reducing and neutralizing agents *before* it has been deformed by being wound up on curlers or rollers, or in any other way, and secondly by the fact that the pre-treatment according to the invention does not seek to impart any permanent deformation to the hair, that is to say any deformation which is resistant to washing, whereas that is the primary object in conventional permanent waving processes.

The present invention is based on the surprising discovery that when the hair is subjected to a chemical treatment analagous to a "permanent," but without rolling the hair up on curlers, the capacity of the hair to "take" a "set" of good quality and greater "holding power" is much improved.

In the first step of the process according to the invention any of the conventional reducing agents now used in the first steps of permaent waving processes may be used, especially those having a thiol base, such as thioglycolic acid, thiolactic acid, thioglycerol, thioglycolic amide, glycerol thioglycolate, etc.

The composition containing the thiols may have a pH between 5 and 10, depending on the nature and concentration of thiol used. For example, thiolglycolic acid may be used at a alkaline pH, whereas thioglycolic amide may be used at a neutral or acid pH.

Conventional additives used in permanent waving compositions may be included in the compositions used to carry out the invention, for example, swelling agents such as urea, which facilitate the penetration of the composition into the hair, sequestrants such as ethylene-diaminotetraacetic acid, so that the product will "keep" longer, bases such as ammonia, monoethanolamine or morpholine, and buffering agents such as ammonium bicarbonate which maintain the pH of the composition at a desired value and constitute an important reserve supply of an alkaline product.

The neutralization step of our new pre-treatment process may be carried out by using compositions having a hydrogen peroxide or alkaline bromate base.

The neutralization step may, however, be avoided by using steps already known in connection with permanent waves, according to which metallic catalysts such as manganese salts or glycol dimethacrylates are added to the reducing composition.

In an alternative method of carrying out the process according to the invention, such metallic catalysts may be introduced into a conventional setting lotion, which may also contain resins in solution. Under these conditions, the application of the setting lotion results in neutralization by the oxygen in the air.

In like manner, in yet another method of carrying out the process according to the invention the second or "neutralizing" step may be effected by introducing an oxidizing agent, such as hydrogen peroxide or an alkaline bromate into a conventional setting lotion.

Another object of the present invention is to provide compositions for use in carrying out the above process, said compositions being essentially characterized by the fact that they contain at least one substance capable of reducing the S—S bonds of the keratin.

In accordance with the invention the durability of the effects produced by the process depends on the concentration of the active ingredients in the compositions used.

Thus when compositions including a high concentration of reducing agent (for example, 0.1 mol per 100 grams of composition) are used, the "holding power"

of the "sets" is improved for a period of about three months. On the other hand, when compositions having a lower concentration of reducing agent (for example, 0.005 mol per 100 grams of composition) are used, the improvement in the "holding power" of the "sets" only lasts about one month.

It is, moreover, preferable to take the state of the hair into account when determining the concentration of the active ingredient to be used and it is best to carry out the pre-treatment on hair which has been dyed or bleached with a composition comprising a weak concentration.

The compositions according to the invention may take the form of solutions, fluid creams, gels, or aerosols, depending upon which form is most convenient to apply.

The advantages of a pre-treatment according to the invention, followed by a conventional "setting," as compared with a conventional permanent wave likewise followed by such a "setting" are:

First, the application of the reducing composition is much easier because it is applied to smooth hair in the absence of any curler or roller.

Moreover, the process according to the invention can be completed in a much shorter time because the time required to roll the hair up on the curlers is saved. It should also be noted that this rolling up requires a certain amount of skill on the part of the user and results in some damage to the hair.

Finally, the "sets" effectuated after pre-treatment according to the invention evolve with time toward the natural shape of the hair. Hair which has, on the contrary, been permanently waved, tends to revert to a crimped state, which is not very attractive.

In order that the invention may be better understood several examples thereof will now be described, purely by way of illustration, and without limiting the invention to the details thereof:

EXAMPLE 1

The following solution is prepared:

Thioglycolic acid—10 g.
Ammonia—3.5 g.
Ammonium bicarbonate—10 g.
Water, q.s.p.—100 cc.

After the hair has been washed and dried it is impregnated with a sufficient quantity of the above solution.

The hair is then covered with a cap and left for 15 minutes.

After copiously rinsing the hair it is neutralized by impregnating it with 100 cc. of a 6 volume hydrogen peroxide solution. The hair is again rinsed, and set in a conventional manner, with water.

When the hair is combed out, it is found that it is both manageable and springy, the locks are easy to position and the hair dressing operation is greatly facilitated.

The "hold" of the "set" remains excellent for about a week.

After that the hair is re-set, using either water or a hydro-alcoholic solution of a conventional resin. It is again found that the "hold" of the new set remains excellent.

This phenomenon continues for each "set" over a period of about three months after application of the pre-treatment according to the invention.

EXAMPLE 2

A composition having the following formula is prepared:

Oxyethylenated cetyl-stearylic alcohol sold under the trademark "Cyclogol N.1"—3 g.
Thioglycerol—1 g.
Monoethanolamine, q.s.p.—pH=9.5
Water, q.s.p.—100 cc.

After having washed and dried the hair 40 grams of the above composition are applied thereto, in the form of a cream which is very easy to handle and spread.

The hair is left for 15 minutes under a cap, and then rinsed.

It is then quickly neutralized with 100 cc. of a 2 volume hydrogen peroxide solution.

The hair is then treated in a conventional manner, to produce a "set," which is found to have the same improved properties as described in Example 1.

The effects of the pre-treatment which has just been described manifest themselves each time the hair is set over a period of about 4 to 6 weeks.

EXAMPLE 3

A solution having the following composition is prepared:

Thiolactic acid—8 g.
Ammonia, q.s.p.—pH=9.5
Urea—3 g.
Water, q.s.p.—100 cc.

This solution is applied as described in Example 1 and excellent results are observed for all "sets" effectuated within the ensuing two and one-half months.

EXAMPLE 4

The following solution is prepared:

Thioglycolic acid—1 g.
Monoethanolamine, q.s.p.—pH=9.5
Water, q.s.p.—100 cc.

This solution is applied as hereinbefore described to hair which has been first washed and dried, and the hair is left for 15 minutes under a cap.

It is then rinsed and impregnated with an aqueous 0.5% solution of manganese sulfate.

It is then rolled on setting curlers and dried.

The manganese sulfate thus spread over the hair acts as a catalyst for the oxidation which takes place as the hair is dried, utilizing the oxygen in the air. This eliminates any odor such as might emanate from a mercaptan, and excellent results are obtained with respect to both the quality and "hold" of the "set."

These results recur for each "set" which is effectuated over a period of about six months from the pre-treatment according to the invention.

EXAMPLE 5

A solution having the following composition is prepared:

Thioglycerol—0.5 g.
Ammonia, q.s.p.—pH=9.5
Distilled water, q.s.p.—100 cc.

This solution is applied to the hair as has been hereinbefore described, without using the metallic catalyst described in Example 4.

It is now possible to dispense with both the neutralizing step and the use of an oxidation catalyst, since in the first place the concentration of the thiol is low, and in the second place the thiolglycerol used has a rather marked tendency to self-neutralization in the presence of the oxygen in the air.

When the hair is set after the pre-treatment just described, no unpleasant odor is released, and each "set" effectuated during the ensuing four weeks exhibits a notable improvement in its quality and "hold."

EXAMPLE 6

A solution having the following composition is first prepared:

Thiolactic acid—1.5 g.
Morpholine, q.s.p.—pH=9
Water, q.s.p.—100 cc.

This solution is applied in the manner hereinbefore described to hair which has been first washed and dried, and is then left in contact therewith for 15 minutes.

After this the hair is rinsed and 20 cc. of the following catalytic lotion is applied thereto:

Polyvinylpyrrolydone—2.5 g.
Manganese sulfate—0.5 g.
Alcohol—25 cc.
Water, q.s.p.—100 cc.

This solution is easily applied and yields excellent results with respect to rapid setting and the suppressing of any odor.

It has the advantage of making it possible to carry out the neutralization of the keratin and the application of a polymer to the hair in a single step.

EXAMPLE 7

The procedure is the same as in Example 6, except that the catalytic lotion described in that example is replaced by an oxidizing lotion having the following composition:

30% polyvinylpyrrolydone/70% vinyl acetate copolymer—2 g.
Alcohol—35 cc.
Hydrogen peroxide—1 g.
Phosphoric acid—0.1 g.
Water, q.s.p.—100 cc.

This solution is easily applied to the hair and gives the same results with respect to rapid setting and the suppression of odors. It also permits the reduced keratin to be neutralized and a polymer to be applied in a single step.

What is claimed is:

1. The method of pretreating moist and unconstrained hair to improve and prolong its setting properties without imparting any permanent deformation to the same, comprising the steps of first applying a composition containing a keratin reducing agent selected from the group consisting of thiolactic acid, thioglycerol, thioglycolic acid, thioglycolic amide and glycerol thioglycolate to the hair,

said reducing agent being present in an amount sufficient to reduce the S—S bonds of the keratin, allowing the composition containing the reducing agent to remain in contact with the unconstrained hair for about 5 to 20 minutes to reduce same and thereafter rising and neutralizing the reduced hair while the hair is unconstrained without permanently deforming the hair.

2. The method of claim 1, in which the hair is neutralized with a composition containing a neutralizing agent selected from the group consisting of hydrogen peroxide and alkaline bromate.

3. The method of claim 1, in which the hair is treated with a composition containing a catalyst to promote the neutralization thereof by the oxygen in the ambient air.

4. The method of claim 3, in which the catalyst is a glycol dimethacrylate.

5. The method of claim 1, in which a rinsing step is carried out after the hair has been neutralized.

6. The method of claim 1, in which a neutralizing solution containing a neutralizing agent and a setting resin is used to neutralize the hair.

7. The method of claim 1, in which the hair is washed before the composition containing the reducing agent is applied to the hair.

8. The method of claim 1, in which the composition containing the reducing agent contains the reducing agent in a proportion of about 0.005–0.1 mole of thiol per 100 grams of said composition.

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U.S. Cl. X.R.

8—127.5; 424—71