

# UNITED STATES PATENT OFFICE

2,464,281

## CREAM HAIR TREATING PREPARATIONS

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No Drawing. Application March 7, 1945,  
Serial No. 581,549

3 Claims. (Cl. 167-87.1)

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This invention relates to preparations for use in the treatment of hair and is concerned particularly with liquid cream preparations for use in hair molding processes, and specifically in permanent hair waving processes.

It is an object of the invention to provide cream hair treating solutions having characteristics heretofore unknown including stability, unimpaired chemical strength, suitable viscosity and opacity, and favorable wetting properties.

Before the era of cold waving, solutions for use in hot waving processes were sometimes creamed by the addition thereto of sulfonated oils. In an effort to secure suitable solutions, oils of varying degree of sulfonation were utilized. To attain complete opacity and a high degree of milkiness, oils of low degree of sulfonation or solubility were necessary. Such oils, however, were found to be unstable in the hair treating solutions; with time the emulsion would crack and oftentimes unsightly precipitates would be formed. This kind of separation was responsible for many permanent waving failures due to lessened or non-uniform strength of the applied solution. Furthermore, such oils were objectionable in odor and exerted an inhibiting effect on the chemical activity of the solution requiring unduly high concentration of the active waving ingredient. It was necessary therefore, if satisfactorily opacifying oils were used, to bottle them separately from the treating solutions to be mixed just prior to use. Even then the wetting properties of the solution were not fully satisfactory and the oils were difficult to rinse from the hair.

Serious consequences of this sort arising from the use of oils of low degree of solubility forced compromises in the direction of oils of higher degrees of sulfonation. Immediately the degree of sulfonation was increased sufficient to give stability and acceptable wave strength, however, unacceptable reduction in viscosity and opacity was encountered.

With the advent of cold waving solutions containing more chemically active keratin reducing agents, such as thiolglycolic acid, instability of a mixture of sulfonated oil with the treating solution became acute. The oils cracked out badly, even overnight in the case of some solutions, and redispersion was exceedingly difficult, if not impossible, so that even in small concentrations the waving efficiency of the solution was profoundly affected.

Preparations of this invention are creamed by the inclusion therein of small amounts of a

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water-insoluble polymeric acrylic acid derivative, inclusive of co-polymers thereof, dispersed therein by an amount of a dispersing agent sufficient to maintain the preparation uniformly opaque and milky in appearance.

Hair treating solutions creamed by agents of this invention exhibit greatly improved stability so that they can be stored without separation of the ingredients, and without serious decomposition or failure of the chemical efficiency of the solution. Mixtures thereof may be bottled by a manufacturer in proper proportions for most effective use, and distributed as a cream solution with assurance that the homogeneity and stability of the solution, even after prolonged storage, will be such as to provide suitably uniform application to the hair of the designed proportion of ingredients, even when the bottle is not shaken prior to use, and satisfactory waving results.

The solutions are completely opaque and milky in appearance, they have suitable increased viscosity over that of the uncreamed solution—reducing dripping and increasing the amount of solution held by the hair—and good wetting properties, both valuable characteristics from the standpoints of effectiveness and ease of application. The hair receives the solution very rapidly and the task of distributing the solution through the tress is simplified. Furthermore, the solution may be readily rinsed from the hair after treatment.

A typical solution is one containing:

	Fluid ounces
35 Thiolglycolic acid -----	0.9
Ammonium hydroxide -----	1.66
Water -----	13.44
Creaming agent -----	0.7
40 Acrylic acid derivative	} Rhoplex and Triton 720 in equal parts
(copolymer)	
Dispersing agent	
Water	

45 The concentration of the reducing agent, thiolglycolic acid, in the reducing solution may be varied in accordance with the particular waving results desired. Likewise the ammonium hydroxide content may be varied according to the pH value desired. In general pH value of the reducing solution should be above 7 and below 12, with the ideal range lying between 9 and 10.

50 Rhoplex, as described by its source, Rohm & Haas, is a water dispersion of fully polymerized acrylic acid co-polymers and is believed to con-

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tain about 50% of amorphous, acrylic acid derivative co-polymer solids. This dispersion is mixed, prior to addition to the hair treating solution, in equal parts with Triton 720 (Rohm & Haas), an aryloxy polyalkylene ether sulfonate commonly referred to as a sulfonated ether. Triton 720 has a commercial form of a paste containing about 30% of the sulfonated ether compound. When .7 ounce of these ingredients are added to 16 ounces of solution, the solution thus contains about 1% acrylic acid derivative and about 0.7% sulfonated ether compound.

This particular concentration of the acrylic acid derivative may be varied although we have found a solution as above described to be highly desirable for hair waving from the standpoint of wetting properties, but less or greater concentrations are contemplated in particular cases. In the case of shampoos, the sulfonated ether compound content may be increased to 15% or more.

Other dispersing agents for the Rhoplex, including sodium alkyl naphthalene sulfonate, or sulfonated oils, may be used but with less satisfactory results. In the case of sulfonated oils, the Rhoplex appears to overcome at least to some extent the adverse effects of sulfonated oils when used as creaming agents alone or in the absence of the Rhoplex.

Dispersions of acrylic acid derivatives inclusive of co-polymers thereof such as the above find equally effective use in the preparation of cream solutions of other hair treating agents, including those containing other keratin reducing agents such as the amides of thioglycolic acid, the various sulphites, cysteine hydrochloride, thioglycerine and various thio acids such as thiomalic, thiopropionic and thiosalicylic, or their amides, whether designed for hot or cold waving use.

I claim:

1. A cream hair treating composition for use in hair molding processes comprising a keratin reducing agent dissolved in an aqueous medium containing a water-insoluble polymeric acrylic acid derivative dispersed therein by a dispersing agent for said acrylic acid derivative, said dispersing agent being present in an amount suf-

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ficient to maintain said composition uniformly opaque and milky in appearance.

2. A cream hair treating composition for use in hair molding processes comprising a keratin reducing agent dissolved in an aqueous medium containing water-insoluble polymeric acrylic acid derivative dispersed therein and, as a dispersing agent for said acrylic acid derivative, an aryloxy polyalkylene ether sulfonate, said composition being opaque and milky in appearance.

3. A cream hair treating composition for use in hair molding processes comprising a thioglycollate dissolved in an aqueous medium containing a water-insoluble polymeric acrylic acid derivative dispersed therein and, as a dispersing agent for said acrylic acid derivative, an aryloxy polyalkylene ether sulfonate, said composition being opaque and milky in appearance.

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