

Patented July 9, 1940

2,207,241

# UNITED STATES PATENT OFFICE

2,207,241

## HAIR WAVING SOLUTION

Gifford D. Davis, South Orange, N. J., assignor  
to National Oil Products Company, Harrison,  
N. J., a corporation of New Jersey

No Drawing. Application February 10, 1938,  
Serial No. 189,893

12 Claims. (Cl. 167-87.1)

The invention relates, in general, to the waving of hair and, in particular, to a novel composition adapted for addition to hair waving solutions and to correlated improvements in waving solutions containing such compositions.

In the art of forming waves or curls of various types, such as permanent, Marcel or finger waves, solutions, usually alkaline in nature, are employed. In the permanent waving of hair by either the machine or machine-less methods, the conventional process comprises first moistening or saturating the hair with an aqueous solution of a suitable softening agent, such as soda, borax, ammonium hydroxide, hydrazine hydroxides or any other suitable alkaline substance. The hair thus treated is then rolled or otherwise fashioned by means of known devices, and preferably under tension, to impart the desired curl to the hair. The hair is dried, usually in the presence of heat, while maintained on these devices. After the hair has dried sufficiently and assumed the desired curl or wave, it is released and the waving operation is completed.

The alkaline solutions usually employed to temporarily soften the hair also serve to deleteriously affect the hair by leaching out the natural oils and otherwise adversely affecting the final texture and appearance of the hair. Moreover, the processes as now practiced often have a tendency of burning or over-steaming the hair.

The general object of the invention is to obviate the foregoing and other disadvantages.

A specific object of the invention is to provide a novel composition which will minimize or prevent the burning or over-steaming of hair during the waving thereof.

Another object of the invention is to provide a composition which will inhibit the usual dryness resulting from the permanent waving of hair.

A further object of the invention is to provide an improved hair waving solution to which human hair will exhibit a better waving response.

An additional object of the invention is to provide an improved waving solution which will aid the hair in retaining its natural texture.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

It has been found that the foregoing and other objects may be achieved by use of the novel composition of the invention in hair waving solutions and which comprises a soap, a degraded glyceride, (mono and/or diglycerides of fatty acids) or mixtures thereof, and an organic solvent vehicle with or without a relatively small

proportion of a triglyceride. This composition may be added to any known waving solution of the alkaline or other suitable type.

The invention accordingly comprises a composition of matter possessing the characteristics, properties and the relation of components which will be exemplified in the composition hereinafter described and the scope of the invention will be indicated in the claims.

The composition of the invention, which is soluble or emulsifiable in water or an aqueous alkaline solution, comprises a water-soluble fatty acid soap, a degraded glyceride of a higher fatty acid and an organic solvent vehicle. Another component, such as a triglyceride, may also be included in composition. The composition may be prepared by merely admixing the several constituents, thereby forming a clear or substantially clear fluid readily soluble or dispersible in water, but it is preferred to produce the composition by dispersing and/or dissolving a suitable natural occurring triglyceride in a suitable inert solvent vehicle and adding a strong alkali thereto in an amount sufficient only to partially saponify the triglyceride, thereby forming the desired soap and degraded glycerides in situ. The composition produced by the latter process is superior in many respects to the product obtained by merely admixing the several ingredients.

In preparing the composition of the invention according to the preferred method, any suitable triglyceride may be employed, such as olive oil, rice bran oil, castor oil, teaseed oil, rapeseed oil, cottonseed oil, cocoanut oil, fish oils, etc. While any common strong alkali may be employed, such as potassium hydroxide, sodium hydroxide, etc. to saponify the triglyceride, it is preferred to use potassium hydroxide. In order to effect the desired saponification of the triglyceride (formation of degraded glycerides), it is essential to employ an inert solvent vehicle of a suitable type, such as a hydroxy or preferably a hydroxy-ether solvent, such as diethylene glycol, Carbitol (diethylene glycol monomethyl ether), Cellosolve (ethylene glycol monoethyl ether) and the like, or mixtures of these or similar solvents. The expression "solvent vehicle" is employed herein to connote any suitable inert organic solvent or mixture of solvents which will function to yield the results described. The temperature under which saponification is carried out preferably lies within 20° C. to 50° C. The quantity of alkali employed may be varied but should not be sufficient to completely saponify the triglyceride. The alkali may be added in an amount sufficient

to partially saponify only part of the triglyceride whereby free triglyceride will remain in the final product.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following examples which are given merely to further illustrate the invention and which are not to be construed in a limiting sense.

#### Example I

64.5 parts of castor oil are admixed with 19 parts of diethylene glycol after which 16.5 parts of KOH (45%) are added with stirring at room temperature. After partial saponification (i. e. after all the alkali is spent), a clear fluid results which may be readily dissolved or dispersed in water or an aqueous alkaline solution such as used in the waving of hair.

#### Example II

60.1 parts by weight of rice bran oil in 24.9 parts by weight of diethylene glycol are saponified with 15 parts by weight of 45% KOH. The product is a clear fluid which will disperse in water or an aqueous alkaline solution.

#### Example III

56.4 parts by weight of olive oil in 29.4 parts by weight of diethylene glycol are saponified with 14.2 parts by weight of 45% KOH. The resultant product is clear and readily disperses in an aqueous medium.

The composition of the invention may be added to the alkaline or other suitable waving solution in any desired quantity depending, inter alia, upon the condition of the hair to be treated, upon the type of waving solution to be used, upon the results or effects desired, etc. Excellent results have been obtained by the use of about 1 to 2 cc. of the composition to each ounce of waving solution. However, this relationship may be varied from about  $\frac{1}{4}$  cc. to 10 cc. per ounce of waving solution. The novel composition will readily blend with any of the known waving solutions in almost any proportion for practical use.

The use of the composition of the invention in conventional alkaline hair waving solutions materially enhances the quality of the wave and no change in the conventional technique is necessary. Burning or over-steaming of the hair is entirely prevented or at least materially minimized by use of waving solutions containing the novel composition. It also makes it possible to perfectly wave over bleached and fragile hair that would otherwise be practically impossible to do. The natural oils and lustre of the hair are preserved and in many instances these characteristics are enhanced. Moreover, the novel composition renders the hair more responsive to the action of the alkaline softening agents, thereby producing a better and more permanent wave. The permanent comes down softer, with more natural life, more lustrous, resilient, and susceptible to better styling.

While the invention is particularly adapted for the treatment of human hair, other similar filamentary bodies may be curled by the use of the novel composition of the invention.

Since certain changes may be made in the above composition of matter and different embodiments of the invention could be made without departing from its scope, it is intended that all matter contained in the above description shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all the generic and specific features of the invention herein described and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween; and that they are intended to be inclusive in scope and not exclusive, in that if desired other materials may be added to my novel composition of matter herein claimed without departing from the spirit of the invention. Particularly it is to be understood that in said claims, ingredients or components recited in the singular are intended to include compatible mixtures of said ingredients wherever the sense permits.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A composition adapted for use in the waving or curling of hair with an alkaline hair softening agent, said composition comprising a water soluble soap, a degraded glyceride of a higher fatty acid and an inert organic solvent of the hydroxy-ether type.

2. A composition of matter adapted for use in the waving or curling of hair with an alkaline hair softening agent, said composition comprising partially saponified olive oil and an inert organic solvent of the hydroxy-ether type, said partially saponified olive oil comprising water soluble soap and degraded glyceride of higher fatty acid.

3. A composition of matter adapted for use in the waving or curling of hair with an alkaline hair softening agent, said composition comprising partially saponified rice bran oil and an inert organic solvent of the hydroxy-ether type, said partially saponified rice bran oil comprising water soluble soap and degraded glyceride of higher fatty acid.

4. A composition of matter adapted for use in the waving or curling of hair with an alkaline hair softening agent, said composition comprising water soluble soap, degraded glyceride of higher fatty acid and diethylene glycol.

5. A hair waving or curling composition comprising an alkaline hair softening agent, a water soluble soap, a degraded glyceride of a higher fatty acid and an inert organic solvent of the hydroxy-ether type.

6. A hair waving or curling composition comprising an alkaline hair softening agent, a water soluble soap, a degraded glyceride of a higher fatty acid and diethylene glycol.

7. A hair waving or curling composition comprising an alkaline hair softening agent, partially saponified castor oil and an inert organic solvent of the hydroxy-ether type, said partially saponified castor oil comprising water soluble soap and degraded glyceride of higher fatty acid.

8. A hair waving or curling composition comprising an alkaline hair softening agent, partially saponified rice bran oil and diethylene glycol, said partially saponified rice bran oil comprising water soluble soap and degraded glyceride of higher fatty acid.

9. A composition adapted for use in the waving or curling of hair with an alkaline hair softening agent, said composition comprising a water soluble soap, a degraded glyceride of a higher fatty acid and an inert organic solvent of the hydroxy-ether type, said soap and degraded glyceride produced in the presence of said solvent.

10. A composition adapted for use in the waving or curling of hair with an alkaline hair softening agent, said composition comprising a water

soluble soap, a degraded glyceride of a higher fatty acid and diethylene glycol, said soap and dehydrated glyceride produced in the presence of said diethylene glycol.

5 11. A composition adapted for use in the waving or curling of hair with an alkaline hair softening agent, said composition comprising a water soluble soap, a degraded triglyceride and an inert organic solvent of the hydroxy-ether type, said

soap and degraded triglyceride produced in the presence of said solvent.

12. A composition adapted for use in the waving or curling of hair with an alkaline hair softening agent, said composition comprising a water 5 soluble soap, a degraded glyceride of a higher fatty acid, a triglyceride and an inert organic solvent of the hydroxy-ether type.

GIFFORD D. DAVIS.