Patented Sept. 30, 1930 1,776,820

UNITED STATES PATENT OFFICE

FOSTER DEE SNELL, OF BROOKLYN, NEW YORK

HAIR WAVING

No Drawing. Application filed September 22, 1928. Serial No. 307,778.

This invention relates to hair waving; and it comprises a process wherein hair is curled or waved by a mild heat in the presence of water vapor and of a minimum amount of ammonia gas (NH_3) set free in place by chemical or metathetical reaction at the time of waving; and it further comprises a pad or a like article containing a dry, mildly alkaline salt adapted to react with ammonia salts to develop free NH_3; said pad frequently containing an ammonia salt in a solid form adapted to react with said mild alkali on access of moisture; all as more fully hereinafter set forth and as claimed.

Hair was formerly exclusively, and is now often curled or waved by the action of a hot iron; a curling iron. Under the influence of heat, tensions existing in a curled hair are relieved and on cooling, the hair retains its new form. This way of curling injures the texture of the hair more or less, so that methods of curling or waving have come into use wherein the action of heat is supplemented by that of an alkali acting in an atmosphere of steam (water vapor). In so doing, a less temperature is required and less damage is done to the hair. All methods of "permanent waving" and curling now in use in hairdressing establishments are based on these facts. In one common method of waving hair, a strand of hair is wrapped around a curling rod, covered with a layer of fabric moistened by ammonia solution (usually 2 to 17 per cent of NH_3) and the whole exposed to heat for 7 to 12 minutes, usually by slipping a tubular electric heater over the assemblage. This gives a good permanent wave, but has the disadvantage of the unpleasant fumes of ammonia permeating the whole establishment. Further, while very little of the ammonia used actually comes in contact with the hair, there is still more than is necessary; there is more attack on the hair by the ammonia than is desirable. Another method includes the use of a labile salt of ammonia, such as the borate or perborate, which will evolve ammonia if heated enough. This does not develop so much odor of ammonia, but the temperatures required are higher than are desirable or pleasant.

I have found that a less time or a lower temperature can be used, with less damage to the hair and less unpleasantness to the subject by the development in situ of nascent ammonia as the result of chemical reaction. In so doing, no high temperature is required, since NH_3 can be so evolved at any temperature. But little NH is required and that is evolved in the direct vicinity of the hair, so that there is practically no odor and, because of the less time and lower temperatures necessary, the operation is much less trying.

In one embodiment of my invention, the "pad" (as it is called in the art) is impregnated with a mild non-volatile alkali, sodium carbonate being the best, although potassium carbonate, trisodium phosphate, borax, etc., may be employed. The pad is impregnated with a solution of the alkali salt and then dried. Substantially insoluble mild alkalis such as calcium carbonate or calcium hydroxid, may be used but are less convenient. Just before using, the dry pad is dipped into or moistened with a solution of a non-volatile ammonia salt. Ammonium chlorid or ammonium sulfate is a suitable salt. Both are cheap and convenient; but of course other soluble ammonium salts may be used, as for example, bromid, oxalate or nitrate. A solution of any soluble, stable non-volatile ammonium salt may be used. The wet pad is then wrapped around the curl on the curling stick in the usual way, covered with a cap, and is gently heated. As the ammonium salt solution penetrates the pad, NH_3 is liberated by reaction with the contained alkali and acts on the hair. The cap forms an enclosed space surrounding the curl and tends to direct the evolved NH_3 against the hair. The liberation of NH_3 not being dependent on heat it is not necessary to exercise great care as to temperature. In this embodiment of my invention, since the solution used does not contain free ammonia, it cannot create a nuisance in storing or handling.

The reverse procedure may be used; the pad being saturated with an ammonia salt and dried. The liquid used for wetting before use is then a solution of a mild alkali, such as sodium carbonate.

In a better embodiment of my invention, the two salts to react on each other, the ammonia salt and the mild alkali, are both contained in the pad in a dry condition. Reaction takes place only in the presence of moisture; that is, at the time of use. When the pad is to be used, it is simply moistened with water and placed in position around the curl. Pending use, the dry pads may be preserved in cartons or otherwise stored indefinitely, without fear of deterioration or development of nuisance.

In the most convenient embodiment of this type of my invention, the pad used consists of two layers of fabric, each separately impregnated with one of the salts and then dried. For example, a sheet of cotton flannel may be impregnated with a solution of ammonium chlorid in the desired amount and then dried, while a similar sheet of fabric is impregnated with a solution of sodium carbonate and dried. Ordinary soda ash may be used. The two dry sheets are then assembled, with or without an intermediate layer of unimpregnated cloth, and compound pads stamped or cut out of the assembled sheets. On moistening the compound pad, reaction begins to take place, but not at such a rate as to create any nuisance or permit any substantial development of NH_3 prior to application to the hair. Suitable pads may be made of absorbent fabric containing from 0.082 to 0.27 grams of sodium carbonate and half these quantities of ammonium sulphate per square inch. The weights given are on a dry basis, and provide for a slight excess of alkali.

Instead of using a 2-layer pad, as just described, a single layer pad may be employed, the pad being treated with a finely powdered mixture of the two salts. Or the two dry powders may be successively applied. In one way of applying the mixture, the two powders are aerially suspended and distributed through the fabric by blasting or suction. A convenient way of applying either a mixture of the two salts or two successive, individual layers of said salts to the surface of the cloth is to suspend the dry powders in a non-aqueous liquid, such as benzol or gasoline, as a thick suspension and plaster the suspension on the cloth as a layer. The benzol is then evaporated off. In benzol, no reaction takes places and the powder or powders may be conveniently made into a plastic composition with its aid.

In impregnating the pads with water solutions of the salts and then drying, it is convenient to use a little gum or other binder. Gum arabic, gum tragacanth, starch, etc., may be used.

What I claim is:—

1. As a hair curling pad, a layer of fabric containing mildly alkaline material in a dry state and also containing a dry ammonium salt.

2. A hair curling pad comprising absorbent fabric containing dry ammonium sulfate and sufficient dry sodium carbonate to react with the ammonium sulfate.

3. The process of fixing hair which comprises placing hair under tension and fixing it with the aid of heat and ammonia evolved and directed against the hair by reaction in close proximity to the hair of an ammonia salt with a mildly alkaline salt.

4. In waving hair, the process which comprises placing hair under tension and fixing it with the aid of heat and ammonia evolved and directed against the hair by reaction in close proximity to the hair of an ammonia salt with sodium carbonate.

5. In waving hair, the process which comprises enveloping the hair with a pad containing a mildly alkaline salt and developing ammonia in place by the reaction of an ammonia salt on said alkaline salt.

6. A hair curling pad comprising absorbent fabric impregnated with at least two chemicals in the dry state, said chemicals being adapted to react to release ammonia upon access of moisture.

7. A hair curling pad for immediate use comprising a layer of absorbent fabric moistened with a solution of an ammonium salt, said pad having been previously impregnated with a mildly alkaline material in the dry state.

8. In waving hair, the process which comprises giving the hair a predetermined formation, and evolving ammonia by chemical action in an enclosed space surrounding said hair for a predetermined time interval.

9. In waving hair, the process which comprises giving the hair a predetermined formation, evolving ammonia by the reaction of an alkali and an ammonium salt in proximity to said hair and maintaining said hair in an atmosphere of the ammonia thus evolved.

In testimony whereof, I have hereunto affixed my signature.

FOSTER DEE SNELL.