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K. S. R. KJENBERG

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HEAT GENERATION FOR PERMANENT WAVING OF HAIR

Original Filed Dec. 14, 1937

FIG. 1.



FIG. 2.

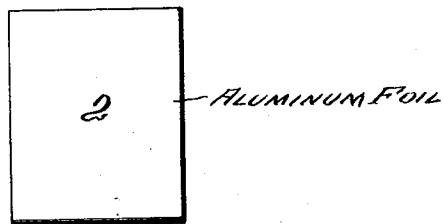


FIG. 3.

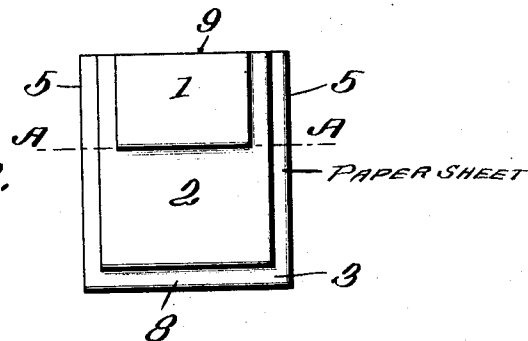
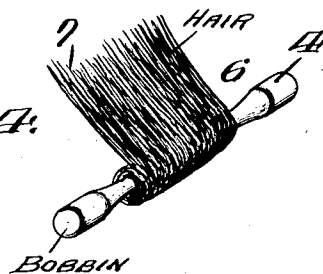


FIG. 4.



INVENTOR

K. S. R. Kjenberg

BY

E. F. Wenderoth

ATTORNEY

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HEAT GENERATION FOR PERMANENT  
WAVING OF HAIRKarl Sigurd Rafael Kjenberg, Helsingfors,  
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cember 15, 1936

6 Claims. (Cl. 132—36.2)

My invention relates to a new method of heat generation to be used in permanent waving of hair and a heat generator for carrying out the said method, the said heat generator being handy in trade and to stock.

I generate the heat necessary for permanently waving hair, by impregnating a sheet of fibrous or textile material with a water solution of a copper salt, drying the said sheet and thereafter immersing same in a water solution, containing chlorine ions, nitrate ions and sodium salicylate, and then folding a sheet of aluminium foil around the first-mentioned sheet and putting the heat generator made in this way round the wisp of hair that has been wound on a bobbin.

The two sheets may be fixed to the coil of hair by means of a clasp.

If desired, the heat generator, when ready for use, may be folded in, for instance, ordinary paper, before being wound round the coil of hair in order to prevent it from coming into direct contact with the hair, the latter thus being protected against becoming dirty, and better heat insulation is obtained.

An illustrative embodiment of the device according to the present invention is shown, by way of example, on the accompanying sheet of drawings wherein:

Fig. 1 is a top plan view of the sheet of fibrous or textile material;

Fig. 2 is a top plan view of the aluminium foil;

Fig. 3 is a top plan view of the paper sheet with the aluminium foil and sheet of fibrous material superposed thereon; and

Fig. 4 is a perspective view of a bobbin with a wisp of hair wound therearound.

Reference numeral 1 indicates the sheet of fibrous or textile material impregnated with a water solution of a copper salt, dried, and thereafter immersed in the above mentioned water solution containing chlorine ions, nitrate ions and sodium salicylate. Reference numeral 2 represents the aluminium foil upon which the sheet 1 is superposed. Superposed sheets 1 and 2 are then in turn laid upon paper sheet 3, substantially as shown in Fig. 3 of the drawings.

In Fig. 4 reference numeral 7 indicates the root ends of the hair. The showing in Fig. 4 is purely diagrammatic, the particular bobbin, bobbin support (not shown), and the like which may be used for winding the hair being purely conventional and, per se, constituting no part of the present invention.

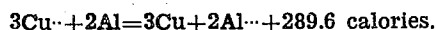
Upon association of the sheets to the form shown in Fig. 3, the foil 2 is folded around the

sheet 1 along the line A—A, and sheet 3 of paper is folded around the whole so that the margin 8 is folded around the upper border 9 of the sheets 1, 2 and 3. The margins 5 of the sheet are also folded so that the sheet entirely encloses a heat generator 1, 2. The heat generator 1, 2 and is encompassing sheet 3 are then placed around the wisp of hair wound on bobbin 4 and fixed thereto by means of a clasp such as is conventionally used in hair waving.

When the sheet impregnated with a copper salt is immersed in the solution containing the chlorine ions, the nitrate ions and the sodium salicylate, and is folded together with the aluminium foil, a reaction occurs between the copper ions and the aluminium metal by which heat is liberated. In the solution containing chlorine ions, nitrate ions and sodium salicylate, the nitrate ions retard the commencement of the reaction, the chlorine ions gradually diminish the influence of the nitrate ions and the reaction begins, the sodium salicylate restraining the intensity of the reaction, so that the heat generation is extended over the time needed for the permanent waving.

As a copper salt, especially suitable for my purpose, I choose cupric chloride,  $\text{CuCl}_2 \cdot 2\text{H}_2\text{O}$ , and I dissolve, e. g., 40 percent by weight of it in water and impregnate the sheet with that solution, the sheet then being allowed to dry. As an especially suitable water solution containing chlorine ions, nitrate ions and sodium salicylate I use a water solution of ammonium chloride,  $\text{NH}_4\text{Cl}$ , ammonium nitrate,  $\text{NH}_4\text{NO}_3$ , and sodium salicylate,  $\text{HOC}_6\text{H}_4\text{CO}_2\text{Na}$ . I dissolve in water, for instance, 6.7 percent by weight of ammonium chloride,  $\text{NH}_4\text{Cl}$ , 28.6 percent by weight of ammonium nitrate,  $\text{NH}_4\text{NO}_3$ , and 8.3 percent by weight of sodium salicylate,  $\text{HOC}_6\text{H}_4\text{CO}_2\text{Na}$ .

The heat generating reaction is as follows



The reaction begins about 20 seconds after the heat generator has been made ready for use.

To carry out my method I have for sale a heat generator for permanent waving, comprising a sheet of fibrous or textile material, e. g. blotting-paper, impregnated with a water solution of a copper salt, and dried afterwards, a sheet of aluminum foil and a bottle of the aforementioned water solution containing chlorine ions, nitrate ions and sodium salicylate.

In accordance with a preferable form of execution I use in the solution of copper salt and in the solution, containing chlorine ions, nitrate

ions and sodium salicylate, the substances just mentioned, e. g. in the weight percentage stated above.

For selling purposes the sheets of blotting-paper treated in the described manner might be of the dimensions  $1\frac{1}{4} \times 2\frac{1}{4}$  inches, and the sheets of aluminum foil somewhat more than double this size.

With the heat generator of the type set forth I generate a temperature of up to 266° F.

I claim:

1. A method of heat generation for permanent waving of hair, which comprises impregnating a sheet of fibrous material with a water solution of a copper salt, drying the said sheet, immersing it in a water solution containing chlorine ions, nitrate ions and sodium salicylate, folding a sheet of aluminium foil around the first-named sheet and putting the heat generator made in this way round a wisp of hair, that has been wound on a bobbin.

2. A method of heat generation for permanent waving of hair, which comprises impregnating a sheet of fibrous material with a water solution of cupric chloride, drying the said sheet, immersing it in a water solution containing ammonium chloride, ammonium nitrate and sodium salicylate, folding a sheet of aluminium foil around the first-named sheet and putting the heat generator made in this way round a wisp of hair, that has been wound on a bobbin.

3. A method of heat generation for permanent waving of hair, which comprises impregnating a sheet of fibrous material with a water solution of 40 percent by weight of cupric chloride, drying the said sheet, immersing it in a water solution containing 6.7 percent by weight of ammonium chloride, 28.6 percent by weight of ammonium nitrate and 8.3 percent by weight of sodium sali-

cyate, folding a sheet of aluminium foil around the first-named sheet and putting the heat generator made in this way round a wisp of hair, that has been wound on a bobbin.

4. A heat generator for permanent waving of hair, comprising a sheet of fibrous material, impregnated with a water solution of a copper salt and dried, and a sheet of aluminium foil, of which sheets the first-named, after immersion in a water solution containing chlorine ions, nitrate ions and sodium salicylate, is adapted to be put together with the sheet of aluminium foil folded over it round a wisp of hair, that has been wound on a bobbin.

5. A heat generator for permanent waving of hair, comprising a sheet of fibrous material, impregnated with a water solution of cupric chloride and dried, and a sheet of aluminium foil, of which sheets the first-named after immersion in a water solution containing ammonium chloride, ammonium nitrate and sodium salicylate, is adapted to be put together with the sheet of aluminium foil folded over it round a wisp of hair, that has been wound on a bobbin.

6. A heat generator for permanent waving of hair, comprising a sheet of fibrous material, impregnated with a water solution of 40 percentage by weight of cupric chloride and dried, and a sheet of aluminium foil, of which sheets the first-named after immersion in a water solution containing 6.7 percentage by weight of ammonium chloride, 28.6 percentage by weight of ammonium nitrate and 8.3 percentage by weight of sodium salicylate, is adapted to be put together with the sheet of aluminium foil folded over it round a wisp of hair, that has been wound on a bobbin.

KARL SIGURD RAFAEL KJENBERG.