Sept. 20, 1938. E. F. SUTER 2,130,748

PERMANENT WAVING

Filed Jan. 13, 1936 2 Sheets-Sheet 1

Fig. 1.

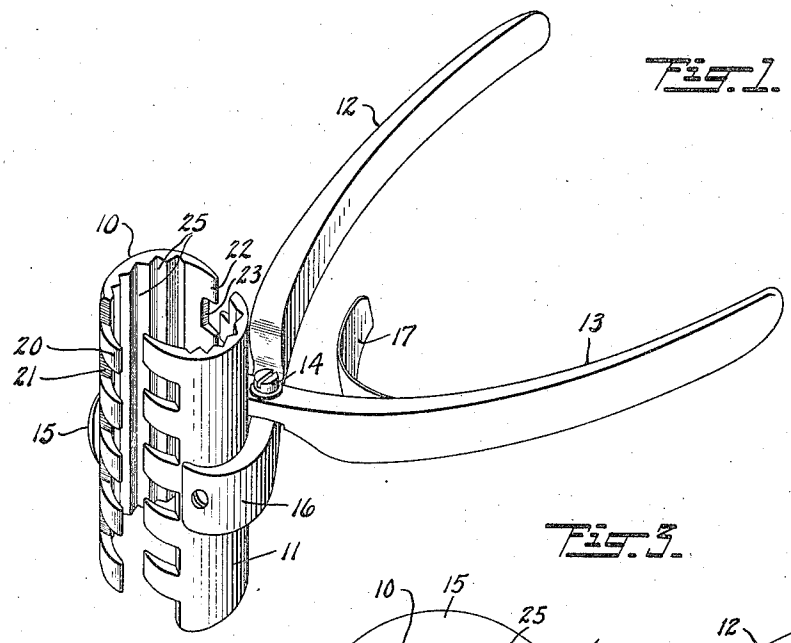


Fig. 3.

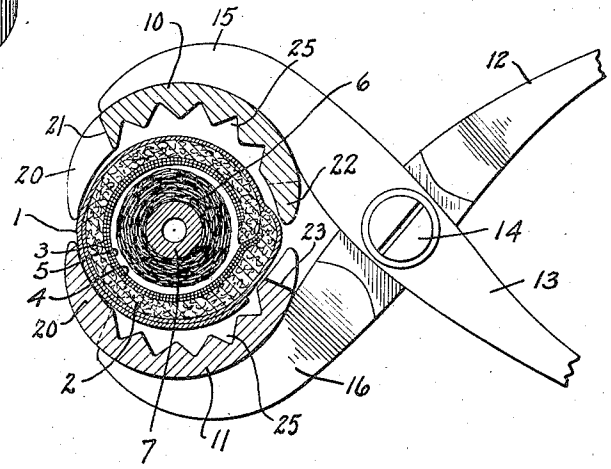


Fig. 2.

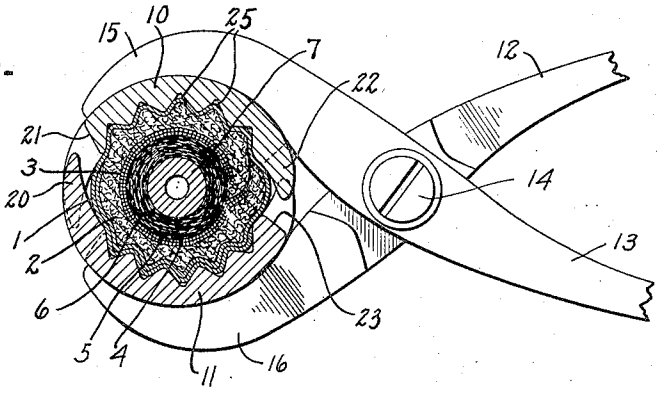
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Filed Jan. 13, 1936 2 Sheets-Sheet 2

Fig. 4.



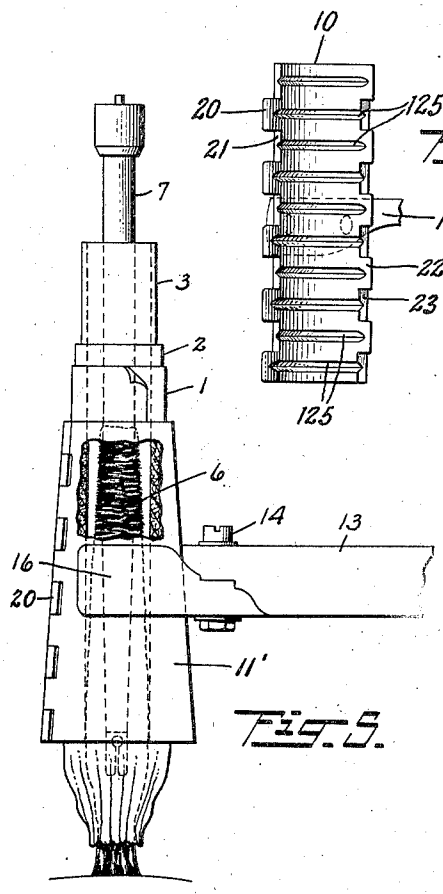


Fig. 5.

Fig. 7.

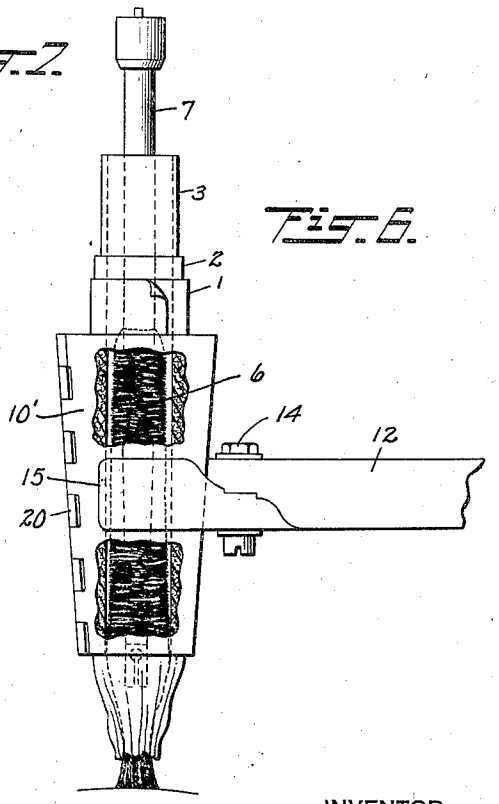


Fig. 6.

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UNITED STATES PATENT OFFICE

2,130,748

PERMANENT WAVING

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Application January 13, 1936, Serial No. 58,836

9 Claims. (Cl. 132—36)

The invention relates to permanent waving and more especially to a method and means for facilitating and improving the operation of electrolytically conductive permanent wave heaters and lotion applicators.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

The invention consists in the novel parts, constructions, arrangements, combinations and improvements herein shown and described.

The accompanying drawings, referred to herein and constituting a part hereof, illustrate one embodiment of the invention, and together with the description, serve to explain the principles of the invention.

Of the drawings:

Fig. 1 is a perspective view of a tool embodying the mechanical features of the invention;

Fig. 2 is an elevation showing said tool in use;

Fig. 3 is a horizontal section on line 3—3 of Fig. 2, but showing the jaws of the tool in open position;

Fig. 4 is a view similar to Fig. 3 showing the jaws in closed position;

Fig. 5 is an elevation showing a modified form of tool;

Fig. 6 is a similar view showing said modified tool being used for a rewaving effect; and

Fig. 7 shows a modified corrugation of the compressing jaws.

The invention is directed to providing a novel and useful method and means for improving the certainty and uniformity of operation of permanent wave heaters, especially of the type wherein heat is created by the passage of electric current through an electrolytically conducting medium, such as the heating means shown and described in the patents to Durham and Finnegan No. 2,014,246 and Durham No. 2,022,657. One object of the invention is to insure uniformity of heating action by imparting a predetermined compression to the electrolytic heating tube or sachet, thereby increasing and simultaneously standardizing the conductivity of the various heating devices on the customer's head. The invention insures such uniformity of heating and also prevents undesired escape of steam and vapor from the curl being heated, regardless of variations in the thickness and shape of different curls.

In commercial practice it is desirable and necessary to supply electrolytic heating tubes of uniform diameter and the interior diameter of such tubes must necessarily exceed somewhat the thickness of the heaviest curl on a head of hair. After slipping the heating tube over the curl it is customary for the operator to compress the tube by hand so as to enhance the conductivity of the electrolytic heating unit and form a substantially vapor-tight chamber about the curl. The amount of compression will depend largely upon the thickness of the individual curl to which a tube is applied. It has been found in practice that many operators are careless and inefficient about properly compressing said tubes, thereby producing non-uniform heating effects on the different curls and on different parts of the same curl. Also compression by hand, even when carefully done, is inevitably non-uniform, and in the case of a thin curl is apt to produce wrinkles or folds along the interior of the heating tube. Such folds frequently form steam channels which direct the steam downwardly against the customer's scalp or upwardly and out of the tube so that the heating and vapor application of the tube is diminished. This is most usual but also most undesirable with thin or fine hair, which frequently requires the most prolonged and intense steaming. Furthermore, the careful hand compression of the tubes is a tedious and time-consuming operation and is attended with some discomfort to the customer. By the present invention, a uniform compression is effected entirely about the tube without wrinkling or distorting the interior surface thereof. Thus an increase in conductivity is attended with enhanced uniformity of heating effect, while a very tight and comfortable steam chamber is formed about the curl.

According to the invention, moreover, pressure is applied externally of the heating pad or sacket in its position when wrapped or applied around or upon the coiled tress of hair, whereby the external electrode or layer is more or less deformed, or its normal circumference reduced. This effect may, according to the invention, be secured under the pressure imposed, by the formation in the external electrode or layer of alternate ridges and grooves that are advantageously disposed substantially parallel, whereby pressure is thus transmitted to the absorbent layer on parallel lines.

Another object of the invention is to impregnate the curl with a certain amount of the waving fluid prior to beginning the heating action,

better results frequently being obtained by such preliminary wetting of the hair with the lotion. By virtue of the present invention, a substantial amount of the waving fluid is squeezed out of the absorbent member and forced into the hair, or a portion thereof, and absorbed thereby prior to the commencement of heating. This not only improves the waving action but it also prevents the dripping of hot liquid on to the head which has heretofore occurred due to the extruding effect of the gas created by the initial flow of current through the electrolyte.

A further object of the invention is to impart a differential compression to the electrolytic heating device along the curl, thereby further accommodating the heating tube and heating action to the peculiar shape or other characteristics of the curl. This feature of the invention has a special value in cases where it is desired to heat the root portion of the curl more thoroughly than the ends, as is commonly done in a "rewave" operation where the ends of the hair contain an old permanent wave and it is desired to apply the principal heating to the fresh growth near the scalp. With such differential compression the greater amount of waving fluid is also expressed into the portion of the hair nearer the scalp, thereby further enhancing the waving effect in that portion.

For carrying out the novel and improved operations hereinbefore described the invention provides a special tube-compressing tool which is adapted to be applied successively to the heating tubes on the several curls of a head. Said tool is constructed to reduce the tubes to a substantially uniform exterior diameter and to compress them so that the interior cylindrical surface of the tube contacts intimately with the curl.

It will be understood that the foregoing general description and the following detailed description as well are exemplary and explanatory of the invention but are not restrictive thereof.

Referring now in detail to the present preferred embodiment of the invention, illustrated by way of example in the accompanying drawings, the invention is shown applied to an electrolytic heating and lotion applying tube of the type hereinbefore identified. Said tube (Figs. 2 and 3) comprises a cylindrical exterior electrode 1 formed of compressible metallic foil, an intermediate absorbent cylinder 2 which is an electric insulator when dry but is adapted to absorb a predetermined quantity of an electrolytically conductive hair waving fluid, and an interior electrode 3 of compressible metal foil. The interior electrode 3 is preferably perforated at least in the portion adapted to contact with the curl, such perforations 4 being designed to emit steam and vapor on to the curl. Usually the interior surface of the inner foil cylinder is provided with an insulating coating such as the parchment paper 5 and said coating is perforated in register with the perforations 4 of the inner foil. The interior diameter of the tube is slightly greater than the thickness of the greatest curls, and the length of said tube is preferably somewhat greater than the longest curl. The electrolytic heating tube is shown applied to a curl 6 wound about a curling rod 7 and it is understood that there would be some twenty to forty such curls so prepared on a customer's head.

Referring now to the embodied means for applying uniform circumferential compression to the heating tube, the invention provides a compression or squeezing tool comprising a pair of substantially semi-cylindrical, opposed jaw members 10 and 11. Said jaw members are designed to form, when closed, a substantially continuous cylinder having an interior diameter substantially less than the exterior diameter of the heating tube.

The axial length of the jaws is substantially greater than the diameter of the cylinder formed by them and is preferably about the length of an average or somewhat longer curl. To facilitate the formation of a complete cylinder when closed, it will be noted that the opening or front edges of the jaws are provided with intermeshing tongues 20 and slots 21 and similar tongues and slots 22 and 23 are provided at the interengaging rear edges of the jaws.

The jaw members are pivotally mounted to open and close about an axis exterior to their linear surface and parallel to an element thereof. As shown, a pair of handle levers 12 and 13 are pivotally connected intermediate their ends by a pin 14 and the short curved ends 15 and 16 of the levers are attached to the jaws 10 and 11 respectively. A suitable spring 17 is provided for normally urging the jaws apart.

The cylindrical jaws are designed to compress the tube and reduce the exterior circumference thereof while maintaining the interior circumference as smooth and devoid of wrinkles or steam channels as practicable. For this purpose the interior surfaces of the jaws are preferably corrugated by a plurality of evenly spaced axial grooves 25. The operation of the device is illustrated in Figs. 3 and 4. The ultimate form of the heating tube is shown in Fig. 4 and it will be noted that the inner surface clings closely and uniformly to the curl while the outer foil is compressed entirely around its circumference in a substantially uniform manner.

It has been found that in most operations it is desirable to compress the heating tube so as to impede the axial movement of vapor, steam and/or liquid in the compressed portion and thereby form the most effective and safe heating chamber. For this purpose the compressor jaws 10 and 11 may be corrugated in a direction other than axial, and in Fig. 7 is shown one of said jaws corrugated with transverse annular grooves 125. In this form of the device the tube will be compressed in a series of horizontal or transverse rings, the lands between the grooves 125 serving to form successive baffles to the axial movement of steam, vapor and liquid within the steaming chamber.

Referring to the modified form shown in Fig. 5, means are illustrated for compressing the curl substantially in accordance with its tapering contour caused by the naturally decreasing thickness of a curl from roots to tip. As shown the jaws 10' and 11' of the tool are formed in a frustro-conical shape and as applied the curl would be compressed substantially uniformly throughout its length by virtue of the diametral diminution of the closed jaws.

For enhancing the heating effect of a curl adjacent the scalp end, as in rewaving operations, the invention provides for compressing the scalp portion of the curl only, or to a greater extent than the outer portion thereof. This operation may be conveniently performed by reversing the frustro-conical tool so that the smaller diameter thereof is applied to the thicker part of the curl near the scalp. This operation will effectively compress the lower part of the tube to a greater

extent than the upper part, thereby confining the greater steaming and heating action to the area where it is most needed and, as stated, introducing the greater amount of lotion at said area. If desired, a tool having shorter jaws for compressing the lower part of the curl only may be provided in lieu of the tapered form shown in Fig. 6.

While here shown in the preferred form as an integral tube, the heating pad or sachet may be provided of separate tubular parts. Thus instead of an inner foil or electrode, the curling rod itself may be provided as the inner electrode and the electric current may pass through the hair tress which for the purpose may be impregnated with a hair-waving lotion adapted to serve as electrolyte. In such case the absorbent layer may be secured to the outer tubular electrode as shown and claimed for example in Patent No. 2,028,051. Or again the outer tubular electrode may be provided separate from the inner tubular electrode and absorbent layer, and when so separately provided the outer electrode may be of metal foil mounted upon an external foundation layer such as hereinbefore described, or a separate sheet of metal formed to a tubular shape and adapted to be more or less permanently deformed on compression and compacting of the tubular heater thus formed.

The invention in its broader aspects is not limited to the specific mechanisms shown and described but departures may be made therefrom within the scope of the accompanying claims without departing from the principles of the invention and without sacrificing its chief advantages.

What I claim is:

1. In a process of permanent waving wherein the heating and steaming of a wound curl is effected by placing an electrolytically conductive heating and lotion carrying device adjacent the hair, the steps of applying external radial pressure to said device substantially uniformly around the portion thereof embracing the curl whereby to increase and render uniform the electrical conductivity of said device and to force lotion out of the device into the hair and thereafter passing current electrolytically through said device to heat and steam the hair.

2. In the process of permanent waving wherein the heating and steaming of a wound curl is effected by placing an electrolytically conductive heating and lotion carrying device adjacent the hair, the steps of uniformly reducing the exterior circumference of said device by applying substantially uniform radial pressures thereto at spaced-apart intervals whereby to increase and render uniform the electrical conductivity of said device and to force lotion out of the device into the hair and thereafter passing current electrolytically through said device to heat and steam the hair.

3. In the process of permanent waving wherein the heating and steaming of a wound curl is effected by placing an electrolytically conductive heating and lotion carrying cylinder around the hair, the steps of applying external radial pressure to said device substantially uniformly around the portion thereof embracing the curl whereby to increase and render uniform the electrical conductivity of said device and to force lotion out of the device into the hair, said pressure being different at different points axially of the cylinder to control the heating effect along the curl and thereafter passing current electrolytically through said device to heat and steam the hair.

4. A device for shaping and compressing a tubular electrolytic heating device upon a wound curl comprising a pair of semi-cylindrical jaws mounted for opening and closing movement to compress the heating device in cylindrical form when on a curl, the axial length of said jaw members being several times greater than the diameter of the cylinder formed by their closure and the interior diameter of said closed cylinder being less than the normal exterior diameter of the heating device and means for opening the jaws sufficiently to encompass said heating device before it has been compressed.

5. A device for shaping and compressing a tubular electrolytic heating device upon a wound curl comprising a pair of semi-cylindrical jaws mounted for opening and closing movement, the jaws when closed forming a cylinder of less interior diameter than the normal exterior diameter of the heating device whereby to evenly compress said heating device in cylindrical form when on a curl and means for opening the jaws sufficiently to encompass said heating device before it has been compressed.

6. A device for shaping and compressing a tubular electrolytic heating device upon a wound curl comprising a pair of semi-cylindrical jaws mounted for opening and closing movement about an axis substantially parallel to that of the curl, the jaws when closed forming a cylinder of less interior diameter than the normal exterior diameter of the heating device whereby to evenly compress said heating device in cylindrical form when on a curl, the interior surfaces of said jaws being corrugated by axial grooves and means for opening the jaws sufficiently to encompass said heating device before it has been compressed.

7. A device for shaping and compressing a tubular electrolytic heating device upon a wound curl comprising a pair of semi-cylindrical jaws mounted for opening and closing movement about an axis substantially parallel to that of the curl to compress the heating device in cylindrical form when on a curl, the axial length of said jaw members being several times greater than the diameter of the cylinder formed by their closure, the jaws when closed forming a cylinder of less interior diameter than the normal exterior diameter of the heating device whereby to evenly compress said heating device in cylindrical form when on a curl and means for opening the jaws sufficiently to encompass said heating device before it has been compressed.

8. A device for shaping and compressing a tubular electrolytic heating device upon a wound curl comprising a pair of semi-cylindrical jaws mounted for opening and closing movement about an axis substantially parallel to that of the curl to compress the heating device in cylindrical form when on a curl, the axial length of said jaw members being several times greater than the diameter of the cylinder formed by their closure, the jaws when closed forming a cylinder of less interior diameter than the normal exterior diameter of the heating device whereby to evenly compress said heating device in cylindrical form when on a curl and having an axial length several times its maximum diameter and means for opening the jaws sufficiently to encompass said heating device before it has been compressed.

9. A device for shaping and compressing a tubular electrolytic heating device upon a wound

curl comprising a pair of semi-cylindrical jaws mounted for opening and closing movement to compress the heating device in cylindrical form when on a curl, the axial length of said jaw members being several times greater than the diameter of the cylinder formed by their closure and the interior diameter of said closed cylinder being less than the normal exterior diameter of the heating device and means for opening the jaws sufficiently to encompass said heating device before it has been compressed, the interior surfaces of said jaws being corrugated by grooves transverse to the axis thereof.

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