Feb. 13, 1940. F. E. DOERR 2,190,057

HAIR CURLER

Original Filed Dec. 17, 1936

Fig. 1

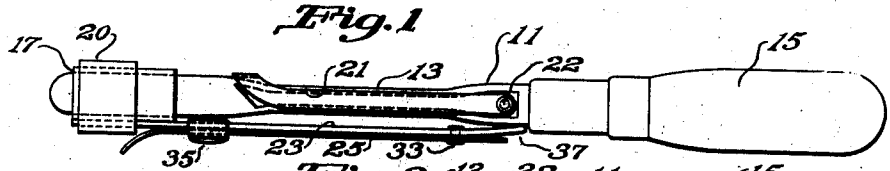


Fig. 2

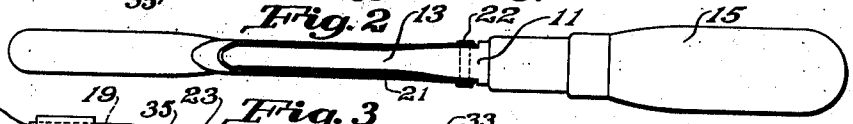
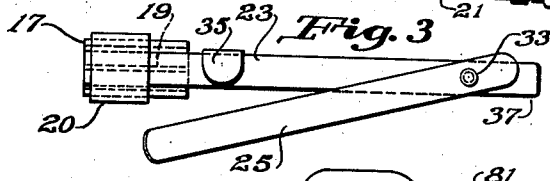


Fig. 3



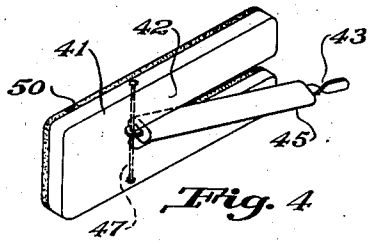


Fig. 4

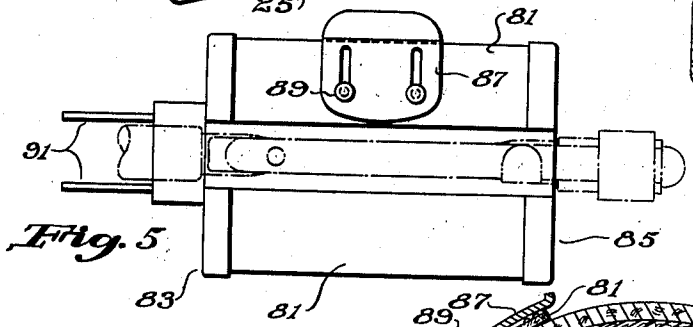


Fig. 5

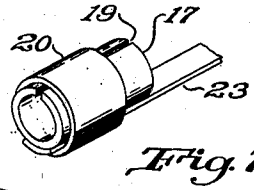


Fig. 7

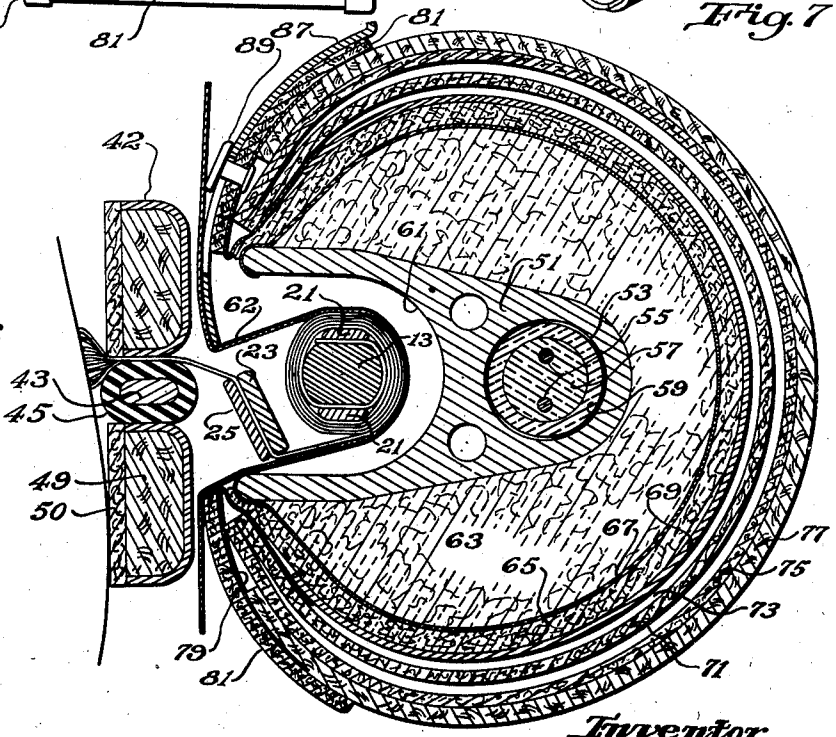


Fig. 6

Witness
Paul F. Bryant

Inventor
Frank E. Doerr
by his attorneys
Fish, Hildreth, Cary & Jenney

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HAIR CURLER

Frank E. Doerr, Lynn, Mass.

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18 Claims. (Cl. 132—36)

The present invention relates to hair curling, and more particularly to a method and apparatus for producing a permanent wave of the so-called Croquignole type.

In Croquignole type of hair waving, as distinguished from the spiral type of winding, the hair is wound on a mandrel or winder from the free end toward the scalp with successive turns superimposed. In the conventional method of Croquignole waving, the first step is to clamp a strand of hair close to the scalp by means of a scalp protector. Then the outer end of the strand is flattened and slipped under the tongue of a clip on the mandrel which is then rotated by the operator while pulling away from the scalp, so as to stretch the hair tightly as it is wound. When the mandrel has been wound up to the scalp protector, it is slipped into appropriate supports in the protector and locked from rotation to prevent the hair from loosening while heat is applied to set the curl.

The conventional method of and apparatus for Croquignole winding requires an operator of considerable skill in order to produce a successful wave, since the hair must be spread correctly into a flat strand which has to be clamped to the winder with each hair under substantially the same tension from the scalp protector, and the winding operation must be performed while stretching the hair under strong tension. The difficulty in using the conventional Croquignole winder has heretofore prevented permanent waving being done in the home by individuals upon their own hair.

The principal object of the invention is to provide a method and apparatus for Croquignole type hair waving which is adapted to permit permanent waving to be done by inexperienced operators, and even by individuals upon their own hair with complete safety and with uniformly satisfactory results.

Another object of the invention is to provide a Croquignole hair winder, hereinafter referred to as a permanent waving iron, of improved construction and arrangement whereby the hair strand is automatically spread and tensioned as it is wound by the curling mandrel.

A further object of the invention is to provide a permanent waving iron having an improved clip for locking the end of a hair strand to the mandrel.

Another object of the invention is to provide a scalp protector of improved construction for clamping and sealing the hair strand close to the scalp to protect the latter from heat and steam during the waving operation.

Still another object of the invention is to provide a heater unit adapted for use with the permanent waving iron to apply to the curled hair the proper amount of heat for successful waving without risk of injury to the person.

With these and other objects in view, a feature of the present invention consists in providing a hair curling mandrel or winder with hair flattening and tensioning means whereby the hair is automatically stretched with an even and predetermined tension between said means and the relatively rotatable mandrel by the winding operation itself without pull on the scalp, thereby avoiding the difficult and often painful operation of the conventional method in which the hair is stretched between the winder and the scalp by combined pull on and rotation of said winder by the operator.

Another feature of the invention consists of an improved clip by which the end of the hair strand is secured to the winder, the clip holding the hair in place by its own spring pressure with no tendency to open.

A further feature of the invention consists of a scalp protector of simple construction and arrangement comprising a body portion provided with a fixed strand-receiving passage or slot and movable means in the slot for clamping the strand therein, the clamping means for the strand effectively sealing said slot to prevent the passage of steam therethrough to the scalp during the application of heat to the wound curl.

Still another feature of the invention is a heating unit particularly adapted for use with the permanent waving iron for carrying out the hereinafter described method of permanent waving, having a heated portion adapted to fit over the permanent waving iron and the wound hair, and provided with insulation covering the heated portion to permit handling and using the device without risk of burns.

Other features of the invention will appear from the following description taken in conjunction with the accompanying drawing, in which Fig. 1 is a view of the permanent waving iron; Fig. 2 is a view of the winder portion of the iron; Fig. 3 is a view of the hair spreading and tensioning means forming a portion of the iron; Fig. 4 is a view of the scalp protector for use with the permanent waving iron; Fig. 5 is a plan view of the heater, the permanent waving iron being inserted in outline; Fig. 6 is an enlarged sectional view through the scalp protector, permanent

waving iron, and heater unit, showing the parts in operative position for permanently waving a strand of hair; and Fig. 7 is a perspective view of the bearing sleeve and a portion of the hair spreading and tensioning means illustrated in Fig. 3.

The permanent waving iron comprises hair clamping, winding, and tensioning means, the hair clamping and winding means being arranged for rotation relative to the hair tensioning mechanism. The hair winding means is illustrated in Fig. 2, and comprises a mandrel 11 having a central portion 13 of reduced diameter upon which the hair is wound as the mandrel is rotated by one hand of the operator by handle 15 secured to one end of the mandrel, the opposite end being rotatably supported in a bearing in sleeve 17 held in the other hand by the operator. The opening or bearing in the sleeve is of a size to receive the end of the mandrel with a close fit, a longitudinal slot 19 being formed in the sleeve to provide for a slight yielding of the bearing walls so that a substantial friction will be developed between bearing and mandrel. This will not be enough to interfere with the winding operation, but it will be sufficient to prevent rotation of the mandrel when it is momentarily released as the operator takes a new grip on the winding handle, or the handle is entirely released after the winding is completed.

A ring 20 of rubber or other suitable material is fitted over the bearing sleeve 17 to afford a non-slipping and heat insulating grip for the hand or fingers of the operator.

The end of the hair strand is secured to the mandrel preparatory to winding by means of a clip 21 of spring metal having two spaced, parallel, flat blades joined together at one end and pivotally attached at the other end to the mandrel by means of a pin 22. A central portion of the mandrel is slightly flattened along opposite sides adjacent the blades, so that when the clip is in closed position, the mandrel and blades together provide a smooth and substantially circular hair receiving surface (see sectional view, Fig. 6). Since the clip engages diametrically opposed faces of the mandrel, there is no tendency for the clip to open, regardless of the thickness of the strand of hair clamped thereunder, or of tension applied to the hair, since any tendency for one side of the clip to open as the hair is drawn taut is counteracted by the tendency of the other side of the clip to be drawn more firmly into clamping contact. With this construction, therefore, the problem of keeping the hair from slipping on the mandrel until one or two turns have been made is completely eliminated, since the hair is securely fastened as soon as the clip is closed.

The hair spreading and tensioning means is separately illustrated in Fig. 3, and comprises cooperating spring metal strips 23 and 25, the former being secured at one end to the bearing sleeve 17.

The strip 25 is arranged to swing into and out of engagement with the strip 23 about a pivot pin 33, a lip 35 preventing the strips from spreading apart when the strip 25 is in closed position. The end 37 of the strip 23 beyond the pivot pin is bent toward the mandrel so as to bear against the same adjacent the end of the handle, thus preventing the body of the strip from being drawn against the mandrel and interfering with the hair wound thereon.

The scalp protector 41 illustrated in Figs. 4 and 6 comprises a body portion 42 preferably stamped out of thin light metal and having a hair-receiving passage or slot open at one end. A tongue 43 provided with a covering 45 of thick soft rubber is pivotally mounted at the closed end of the slot on pin 47. The soft rubber covering insures a tight seal with hair strands of various thickness which effectively prevents the seepage of steam to the scalp through the slot during the application of heat to the wound curl. Additional protection is afforded to the scalp by a cork insert 49 set into the body 42, and by a layer of felt 50 secured to the cork.

After the hair has been wound onto the mandrel it is necessary to apply heat in order to set the curl. An improved heating unit for this purpose is illustrated in Figs. 5 and 6, and comprises an electrically heated core 51 shaped to fit over the wound curl and iron, and suitably insulated to permit use of the heater close to the scalp without risk of burns or discomfort. The core portion 51 is formed of light metal, having a cylindrical passage 53 in which is inserted the electrical unit comprising resistance wires 55 vitrified spaces 57 and enclosing shell 59. The core is also provided with a deep channel 61 which partially embraces the portion of the permanent waving iron bearing the wound curl with sufficient clearance to allow for the usual protecting pad 62 of foil and asbestos or other suitable material, the object of which is to keep the hair out of direct contact with the core of the heater.

The insulation of the heater comprises layers of materials selected for their non-conductive or non-absorptive thermal qualities. Surrounding the core 51 is a filling of magnesia 63, separated from a sheet of asbestos 65 by thin polished aluminum 67. The asbestos is covered by a second sheet of aluminum 69. A sheet of fibre 71 is spaced from the aluminum to provide a dead air space 73, and a second sheet of fibre 75 is likewise spaced from the sheet 71 to provide a second air space. As a final outer covering, a thin layer 77 of cork surrounds the outer fibre layer 75. The edges of the various layers of insulating material adjacent the channel are concealed by thin aluminum channel-shaped strips 79 having a protective covering of fibre strips 81 to prevent accidental contact therewith. Cap-pieces 83, 85, have similarly arranged layers of insulation between them and the core 51. A clip 87 slidably mounted on the heater by means of rivets 89 serves to hold the heater in place on the iron while the curl is being set. The cap-piece 83 is provided with the electrical contacts 91 which are connected with resistance or heating wires 55 and which fit into the conventional electric outlet for heating the unit preparatory to use.

In performing the curling operation in accordance with the improved method and utilizing the apparatus comprising the invention, the first step is to clamp a flattened strand of hair as close to the scalp as possible by means of the scalp protector 41. The outer end of the hair strand is then smoothed and flattened and clamped to the mandrel 11 beneath the clip 21. The hair strand is likewise laid over the tensioning strip 23 and the movable strip 25 is turned to closed position under lip 35. Then the operator, holding the sleeve 17 against rotation by gripping ring 20 in one hand, rotates the mandrel with the other hand to wind the hair thereon until the entire strand is wound up and the permanent waving iron is positioned close to the scalp, as shown in Fig. 6. Due to the cooperating action of the flat spring strips 23 and 25, the hair strand is automatically flattened transversely into a thin wide

strand of the Croquignole type, and at the same time the proper tension is applied, all without requiring any particular skill or effort on the part of the operator.

After the permanent waving iron has been brought by the winding operation to substantially the position illustrated in Fig. 6, the curl and iron are covered with the protective pad or sheet 62 which has been soaked in a borax or other suitable waving solution. Then the heater, which previously had been plugged into an electric outlet and left for the prescribed time to reach the proper temperature, is placed over the protective pad and the clip 87 fitted over the unit. The heater is left in place for a specified time, after which the apparatus is removed and the curl given the usual after-treatment.

It will be noted that in the preferred construction herein shown and described the mandrel is held from reverse rotation by frictional resistance, and while this opposes the turning or winding effort of the operator, it is not great enough to interfere with the convenient and easy operation of the device or require the exercise of any undue muscular effort by the operator. Furthermore, the use of such frictional resistance is of particular advantage since it enables the waving iron to be wound in either direction yet held securely for reverse rotation and loosening of the curl. Thus the iron is adapted for use with left handed operators as well as with right handed, permitting the winding with both classes of operators to be performed in the proper and correct manner with the strand uppermost and its winding on the mandrel in full view.

Another feature of advantage of the construction illustrated in the drawing is the providing of a tension device and spreader carried by the mandrel support, but spaced from the mandrel. Thus the strand is wound with the portion immediately adjacent the mandrel under a uniform tension and of the desired amount without requiring the exercise of any particular skill or manual dexterity on the part of the operator.

By providing an electrical heating unit which when in use is entirely detached from the source of supply, not only are the safety and convenience inherent in this type of heater obtained, but the trouble and annoyance and interference caused by the usual connecting cable or cord are eliminated.

While the present invention has been shown and described in connection with a specific construction, it is to be understood that it is not limited thereto but may be embodied in other forms and arrangements within the scope of the appended claims.

The nature and scope of the invention having thus been described, what is claimed is:

1. A mandrel for winding hair having diametrically opposed flat faces and means for clamping the hair to the mandrel comprising a pair of parallel, spaced, yielding members connected together at one of their ends and pivotally mounted at the other of their ends upon the mandrel to clamp the hair yieldingly against the flat faces on the mandrel.

2. A device for waving hair comprising a mandrel, means for securing the hair thereto, a pair of tension members having normally fixed hair engaging faces between which the hair is drawn to spread and tension the same, and means for rotating the mandrel.

3. A device for waving hair comprising a mandrel, means for clamping the hair thereto, means comprising a pair of yielding, normally stationary hair engaging members between which the hair is drawn for tensioning the hair, and means for rotating the mandrel relatively to said tensioning means to draw the hair through the tensioning means as the hair is wound on the mandrel.

4. A device for waving hair comprising a rotatable mandrel, means for clamping the end of a strand of hair thereto, and means having smooth hair engaging faces held in fixed position relatively to the mandrel for spreading and tensioning a limited length of the strand of hair as the mandrel is rotated relatively to said means to wind the strand of hair on said mandrel.

5. A permanent waving iron for Croquignole type hair waving comprising a mandrel, means for securing the end of a strand of hair to the mandrel, means for rotating the mandrel, and stationary means rotatably supporting the mandrel for spreading and tensioning the hair between said means and the mandrel as the mandrel is rotated relatively to said means to wind the hair thereon while drawing the hair through the spreading and tensioning means.

6. A permanent waving iron for Croquignole type hair waving comprising a mandrel, means for clamping the end of a hair strand thereto, mechanism independent of the mandrel and comprising a pair of normally fixed hair engaging members for spreading and yieldingly clamping the hair, and means for rotating the mandrel relatively to said mechanism to draw the hair through the mechanism and wind the hair on the mandrel while stretching the hair between the mandrel and said mechanism.

7. A device for waving hair comprising a mandrel, means for clamping the hair thereto, a handle for rotating the mandrel, and means engaging the mandrel with yielding frictional contact to prevent free rotation of the mandrel in both directions.

8. A device for waving hair comprising a mandrel having a friction and bearing surface at one end thereof, a handle for rotating the mandrel, and a bearing member for supporting the end of the mandrel and provided with a friction surface cooperating with the friction surface on the mandrel to prevent free rotation of the mandrel in both directions.

9. A device for waving hair comprising a mandrel having a bearing surface at one end thereof, a handle for rotating the mandrel, and a split sleeve to receive the bearing surface of the mandrel and engage the same with a yielding, frictional grip to prevent free rotation of the mandrel in both directions while permitting rotation by the handle.

10. A device for waving hair comprising a mandrel, means for clamping the hair thereto, a handle at one end for rotating the mandrel, a cylindrical bearing member for rotatably supporting the other end of the mandrel, and stationary means supported by the bearing member for spreading and tensioning the hair for winding on the mandrel.

11. A device for waving hair comprising a mandrel, means for clamping the hair thereto, a handle for rotating the mandrel, means for engaging the mandrel with yielding frictional con-

tact to prevent free rotation of the mandrel in both directions, and devices carried by the mandrel engaging means for spreading and tensioning the hair for winding on the mandrel.

12. A device for waving hair comprising a mandrel upon which the hair is wound, and a substantially cylindrical heating unit having a longitudinal slot to receive the mandrel, a slide mounted on the unit and movable over the slot to secure the mandrel therein, and means for heating the unit.

13. A heater for use in the waving of hair comprising a metallic core portion having a body of substantial mass provided with a laterally extending channel adapted to receive a wound curl and its supporting means, an electrical resistance unit in the body of said core for heating the same, thermal insulating means surrounding the core, means for retaining the heater on the wound curl, and electrical connecting means whereby the resistance unit may be supplied with electricity for heating the same.

14. The method of waving living hair which comprises clamping a strand of hair close to the scalp, winding the strand from its outer end toward the scalp in flat, superimposed coils while stretching a limited length of the hair strand adjacent the wound portion without pull on the scalp, moistening the wound strand with a treating solution, enclosing the wound and moistened portion in a wrapper, and subjecting said portion to heat to fix the curl therein.

15. A scalp protector for use in waving living hair comprising a body having a hair-receiving passage therein between opposed spaced parallel walls, a tongue pivotally mounted between said walls adjacent the closed end of the passage and adapted to be moved into and out of the passage, and yielding means on said tongue for clamping a hair strand between said means and one wall of the passage, the other wall being directly engaged by said means.

16. A mandrel for winding hair having diametrically opposed flat faces and means for clamping the hair to the mandrel comprising a pair of parallel, spaced, yielding members connected together at one of their ends and pivotally mounted at the other of their ends upon the mandrel to clamp the hair against the flat faces on the mandrel, said members having flat inner faces and rounded outer faces whereby the mandrel and said members provide a substantially circular exterior winding surface.

17. A device for waving hair comprising a mandrel having a cylindrical bearing face at one end and an operating handle at the other, a sleeve removably mounted upon the bearing end of the mandrel and engaging the same with a substantial yielding frictional contact, and hair spreading and tensioning means secured to the sleeve at one end and free at the other, said means comprising a pair of yielding bars between which the hair is drawn, the bars being pivoted together to permit insertion of hair therebetween with means for securing the bars in operative position.

18. A device for waving hair comprising a mandrel having a cylindrical bearing face at one end and an operating handle at the other, a sleeve rotatably mounted upon the bearing end of the mandrel, and means for spreading and tensioning the hair positioned adjacent and parallel to the mandrel, said means being supported at one end by the sleeve and free at the other end.

FRANK E. DOERR.