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G. H. TAYLOR

3,521,646

METHOD OF ROOTING HAIR IN SYNTHETIC SCALP BY SECURING
HAIR AND DIPPING INTO LIQUID PLASTIC

Original Filed Oct. 9, 1968

2 Sheets-Sheet 1

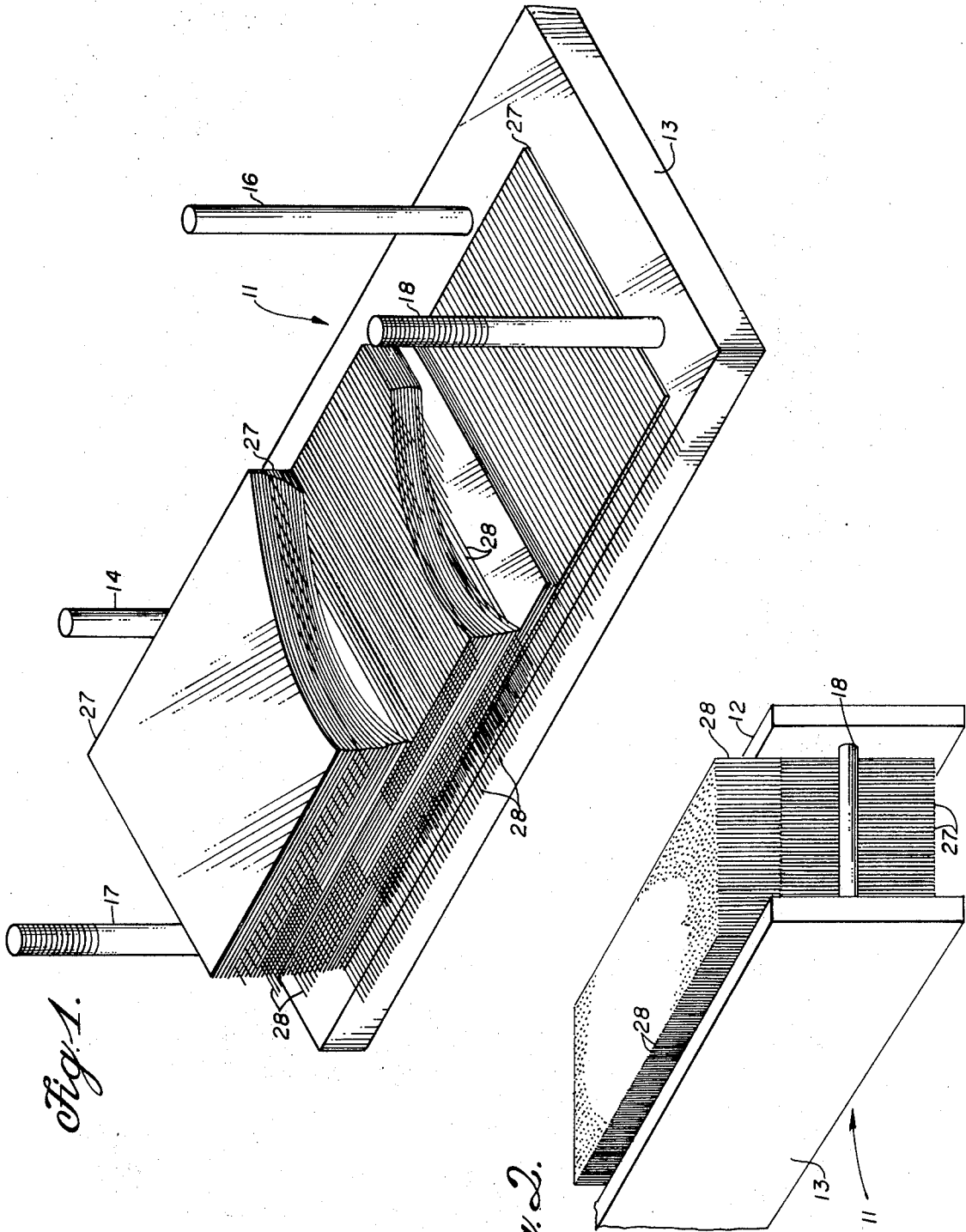


Fig. 1.

Fig. 2.

INVENTOR.
GLEN H. TAYLOR

BY
Fryer James & Fair Phillips & Lempio
ATTORNEY

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Fig. 3.

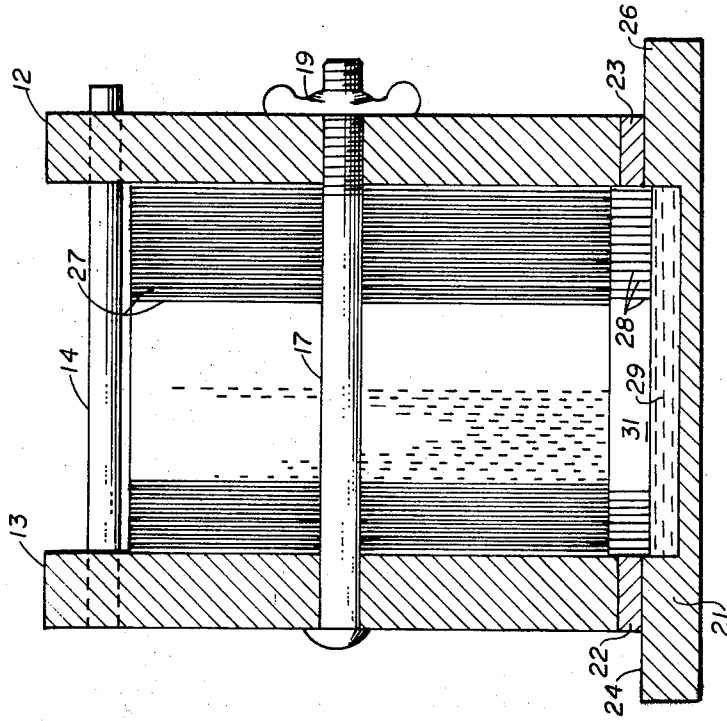
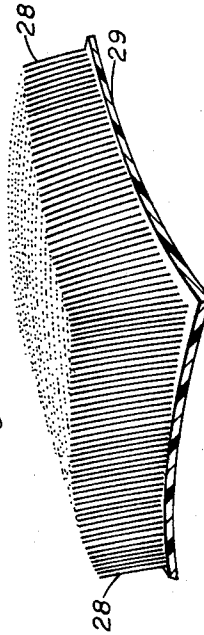


Fig. 4.



INVENTOR
GLEN H. TAYLOR

BY
Frye Jensen & Lewis Phillips & Lempio
ATTORNEY

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**METHOD OF ROOTING HAIR IN SYNTHETIC
SCALP BY SECURING HAIR AND DIPPING
INTO LIQUID PLASTIC**

Glen H. Taylor, 1641 El Camino Real,
Millbrae, Calif. 94030

Continuation of application Ser. No. 766,332, Oct. 9,
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Int. Cl. A41g 5/00

U.S. Cl. 132—5

2 Claims 10

ABSTRACT OF THE DISCLOSURE

A method is presented for rooting hair in a synthetic scalp material to produce a product useful in manufacturing hairpieces. The hair to be rooted is laid between thin rigid dividers and after being suitably secured therebetween, the hair ends are dipped into a shallow trough filled with liquid plastic. The plastic thereupon cures to a pliant flexible solid and the hair ends are fixedly retained therein. The dividers are thereafter removed from between the hair rows and the cured plastic base is removed from the trough.

CROSS-REFERENCE TO RELATED APPLICATION

This application is a continuation of my copending application for "Toupee," filed in the U.S. Patent Office on Oct. 9, 1968, and having the application Ser. No. 766,332.

BACKGROUND OF THE INVENTION

The present invention relates to a method for producing hairpieces and more specifically to a method for rooting hair in the scalp portion of a hairpiece.

Traditionally hairpieces are manufactured by securing strands of hair to a fine mesh or lace base. The mesh or lace base is generally shaped to the contour of the bald spot and is normally secured thereto by means of spirit gum or similar types of adhesive. Such traditional hairpieces, however, suffer from a number of defects which not only quite often result in an artificial appearance, but also actually can cause a great deal of discomfort to the wearer. Since the hairpiece is actually "glued" to the scalp of the wearer, air is prevented from circulating and contacting the skin whereby such hairpieces tend to be quite hot, which in turn produces excessive perspiration with its attendant problems. In addition the adhesives used to secure the hairpiece to the skin often are quite irritating to the wearer, and in fact even can cause rashes and sores on the skin. Aside from the discomfort to the wearer, such mesh base hairpieces, because of the manner in which the individual strands of hair are knotted to the mesh itself, can only with the greatest care and dextrous manufacture produce a natural looking product. The hair has a tendency to lay completely flat, unlike natural hair which grows from the scalp at relatively right angles from the skin surface. And finally, such mesh base hairpieces are rather delicate products, since combing and brushing tends to loosen the knotted hair strands from the mesh base.

In recent years hairpieces of improved construction have appeared on the market. Such hairpieces generally comprise a semi-rigid, thin, plastic base which is generally contoured to the bald spot of the wearer. This thin, semi-rigid, plastic base is separated from the scalp of the wearer

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by a narrow space whereby air is freely permitted to circulate between the hairpiece itself and the scalp of the wearer. The upper surface of the plastic base is generally provided with a hair-retaining means of some type, such as the traditional hair-knotted-in-net base, or in more technologically advanced products, with a polymeric plastic scalp material in which hair is rooted.

With regard to the net surface hairpieces, it will be obvious that the problems of loosening hair and unnatural appearance previously alluded to continue to exist. On the other hand, those hairpieces utilizing a polymeric plastic scalp material with the hair rooted therein present a much more realistic appearance and further tend to be somewhat more durable than the net base type. But hairpieces with the polymeric scalp material still suffer from a number of deficiencies.

One prior art method for producing hair rooted in a polymeric plastic scalp material is that shown in French Pat. 1,003,034, Inventor M. E. Upmeier. In this prior art method, strands of hair are laid between a series of separator plates with the ends of the hair extending beyond the edges of the plate. The hair and separating plates are then clamped together in a multiple number of units to form an end surface of the desired area. The hair ends projecting beyond the plates are then clipped to a uniform length extending slightly beyond the ends of the separator plates. A suitable plastic material in the form of a semi-solid "gel" is then buttered onto the hairs extending beyond the ends of the clamping plates. The plastic is buttered onto the hair ends in a sufficient thickness to form a "skin" and to retain the hair ends therein. The plastic material is then permitted to set to a solid of a soft flexible scalp-like consistency. After the plastic has set, the clamps are removed and the separator plates are pulled out from between the rows of hair. The resultant product is a reasonable facsimile of the human scalp with hair growing therefrom. The plastic scalp with the hair rooted therein may then be cut into suitable segments and thereafter glued onto the semi-rigid plastic base to form the desired hairpiece, such as that shown in U.S. Pat. No. 2,850,023 issued Sept. 2, 1958 to G. H. Taylor.

However, in the aforementioned method of production, the hair tends to be rooted in the plastic scalp material in long even rows much in the manner of corn growing in a field. Hair growing from a natural scalp, of course, follows a random pattern. In addition in the aforementioned method of rooting the hair in a plastic base, the base material is actually applied to the hair ends in the semi-liquid or "gelled" state. Since the hair is held in long rows between divider plates and thereafter the semi-solid or "gelled" plastic is buttered over the hair ends which extend beyond the dividers, the semi-solid plastic has a tendency to extrude into the spaces between the individual hairs and the dividers. The result is an amount of plastic "flash" extending above the scalp surface in between the individual hairs. Thus upon close examination, the synthetic scalp material forms a "rigid" appearance in contrast to the relatively smooth surface of a normal scalp.

SUMMARY OF THE INVENTION

A method has now been developed for rooting hair in a plastic scalp material that overcomes the problems referred to above. In practicing the method of the present invention, a product is produced wherein the hair

and synthetic scalp material present a completely natural appearance which is essentially indistinguishable from natural hair emerging from the scalp.

In the present invention hair is laid down in rows and clamped between a plurality of thin divider plates in the same manner as in the previously referred to French Pat. 1,003,034. The hair ends are permitted to extend beyond one edge of the clamped hair-divider plate sandwich. The unclamped hair ends are then clipped to a uniform length and the extreme ends thereof are then immersed in a pool of liquid plastic. The liquid plastic is retained in a shallow trough with the clamped hair-divider plate "sandwich" suitably resting thereabove.

Although the extreme hair ends are immersed in the plastic the "sandwich" assembly is suspended sufficiently above the plastic pool so that no portion of the plastic touches the dividers nor the hair immediately adjacent.

With the "sandwich" suspended thereabove, and the extreme hair end immersed therein, the plastic is then permitted to cure to form a tough flexible scalp-like layer. Upon solidification the hair ends are tightly retained within the plastic "skin."

It is therefore an object of the invention to provide a method for rooting hair in a synthetic scalp material wherein the hair emerge "naturally" therefrom.

It is another object to provide a method for rooting hair in a synthetic scalp material wherein the hairs emerge from the scalp material randomly.

It is yet another object to produce a hair-scalp product wherein all plastic "flash" is eliminated from between the emerging hairs.

The invention is further illustrated in the accompanying drawing in which:

FIG. 1 is an isometric view of the hair-divider plate "sandwich" partially built up on the clamping fixture with parts broken away;

FIG. 2 is an isometric view of the clamped hair-divider plate "sandwich" with the hair ends clipped to a uniform length;

FIG. 3 is a cross-sectional view of the "sandwich" and trough with the extreme hair ends immersed into the plastic; and

FIG. 4 is an isometric view of a portion of the product of the invention.

Further objects and features of the invention will become apparent from the following description:

Referring to FIGS. 1, 2 and 3 of the drawing, the apparatus for the invention comprises a clamping fixture comprising front and back clamp plates 12 and 13, respectively, with positioning and connecting rods 14, 16, 17 and 18 all affixed to clamping plate 13 and extending therefrom. Two of the rods 17 and 18 are threaded at one end to receive a wing nut, one of which is shown at 19 in FIG. 3. Clamp plate 12 has holes suitably positioned therein to receive the ends of rods 14, 16, 17 and 18 therethrough so that both plates may be positioned in correspondence with one another.

A shallow trough 21 shown in cross-section in FIG. 3 is provided wherein the trough is co-extensive in length with plates 12 and 13. Trough 21 is also provided with spacing blocks 22 and 23 on the upper shoulders 24 and 26. The purpose of the spacing blocks will be readily apparent in the subsequent description.

Rods 14, 16, 17 and 18 are affixed on plate 13 so as to precisely position hair dividers 27 therebetween. Thus rods 14 and 16 are placed to bear against the upper edge of the dividers while rods 17 and 18 confine the dividers on the two sides thereof. Hair dividers 27 consist of very thin metal or plastic sheets that are quite rigid. Thin sheet aluminum serves very well as the dividers. A large number of divider sheets are provided. In fact a number sufficient to build the hair-divider "sandwich" hereafter described.

The product of the invention is produced as follows:

The clamp plate 13 with the rods projecting upward is

placed on any suitable work surface. A first divider 27 is placed on the plate and positioned within the confine of rods 14, 16, 17 and 18. An amount of hair stock which has been previously blended and carded in rather evenly distributed as a thin layer of hairs 28 along the upper surface of divider 27. The hairs 28 are distributed such that a portion thereof extends beyond the edge of divider 27 remote from rods 14 and 16. The hair ends extend a fairly uniform distance beyond the edge of divider 27, for instance a minimum of about $\frac{1}{4}$ to $\frac{3}{8}$ of an inch.

After distributing a layer of hair 28 on the divider 27 as described, a second divider 27 is laid over the hair in exact register with the underlying divider. A second layer of hair is then distributed over the second divider exactly as described with respect to the first layer. Continuing dividers and hair layers are built up until a hair-divider "sandwich" extends above plate 13 and between rods 14, 16, 17 and 18.

It should be noted that not only do the ends of hairs 28 extend beyond the edge of the dividers but also beyond the corresponding edge of plate 13.

Having built up the hair-divider "sandwich," the second clamping plate 12 is placed thereover with rods 14, 16, 17 and 18 passing therethrough. Wing nuts 19 are threaded onto rods 17 and 18 and tightened sufficiently to clamp the hair-divider "sandwich" into fixture 11.

A clippers is then applied to the extending ends of hair 28 to clip them off to a uniform distance beyond the edge of plates 12 and 13. The resultant clipped and clamped hair-divider "sandwich" is illustrated in FIG. 2.

The trough 21 secured to a suitable work surface is then partially filled with a quantity of a suitable liquid plastic. A liquid soft curing acrylic plastic such as methylmethacrylate gel produced by mixing a methylmethacrylate monomer with a fine particle polymer in suitable proportions is quite suitable to form the plastic "skin" utilized in the invention. Such plastic materials are commercially available from such companies as Rohm and Haas or the Dow Chemical Co. Upon mixing such plastic gels are of a creamy consistency, however upon standing they cure to a tough flexible cohesive solid in short periods of time, i.e., from about 5 minutes to 1 hour depending upon mixing proportions, temperature, etc.

In any event, the liquid plastic upon mixing is poured into the trough 21 to a depth of approximately $\frac{1}{16}$ of an inch. The hair-divider "sandwich" in the fixture 11 is thereupon inverted and set down on the trough 21. The spacing blocks 22 and 23 form the surfaces upon which the fixture 11 rests.

Spacing blocks 22 and 23 are of the proper thickness such that the extreme ends of hairs 28 are immersed into the plastic layer 29. In addition, the hair-divider "sandwich" is spaced from the upper surface of the plastic 29 to define an air-space 31 therebetween.

The air space 31 may suitably be approximately $\frac{1}{8}$ inch or slightly more between the upper surface of the plastic 29 and the lower edge of the dividers 27. The air space serves a two-fold purpose: (1) by making sure that the plastic 29 never contacts the dividers 27, the production of unsightly "flash" between the hairs is avoided; and (2) the hair ends extending through the air space are thereby permitted some freedom of movement in the horizontal plane whereby the hairs enter the plastic in a relatively random pattern, thus avoiding the "row of corn stalks" look of prior art hairpieces.

In any event, the plastic 29 is then permitted to air cure for a sufficient period of time to form a flexible, solid, skin-like layer. After the plastic has cured, the fixture 11 is lifted from trough 21 whereby the plastic "skin" is separated therefrom.

The hair ends are securely locked in the cured plastic "skin" to form a piece of hair and scalp suitable for use in toupees of the type disclosed in the aforementioned Pat. No. 2,850,023. It is only necessary to unthread the wing nuts 19 from rods 17 and 18 to remove the fixture

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11 from the hair and divider "sandwich." The dividers 27 are then easily slipped out from between the hairs embedded in the plastic "skin" 29 to yield the product, a portion of which is illustrated in FIG. 4.

What is claimed is:

1. In a method for embedding hair in plastic wherein a multitude of hair strands are clamped between a plurality of very thin semi-rigid dividers with at least a portion of each hair strand protruding from one end of said dividers, and wherein the protruding hair ends are clipped to a uniform length and their extreme ends are immersed in a shallow pool of liquid plastic and the plastic is thereafter cured to a solid, the improvement comprising providing a space between said hair dividers and the pool of plastic of a width sufficient to allow movement of the protruding hair ends relative to said dividers and random immersion of said extreme hair ends in said plastic.

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2. The method of claim 1 wherein said space is approximately one-eighth inch or more in width.

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LOUIS G. MANCENE, Primary Examiner

15 J. N. ESKOVITZ, Assistant Examiner