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(54) Method, apparatus and hair extension product thereof

(57) Method of preparing hair extensions (1) for creating hairstyles, in which a quantity of thermoplastic resin is applied in the fluid state to one end of a lock of hair (1). The ends of the hairs in contact with the resin are compressed between a concave surface (6) and a corresponding convex surface (7) and then removed, with

the result that they assume the shape of a concave shell (2) similar in form to a fingernail, which becomes rigid once the resin has cooled.

A moulding tool for carrying out the said method is also described, in various embodiments as a pair of pliers (3) and as a manual press.

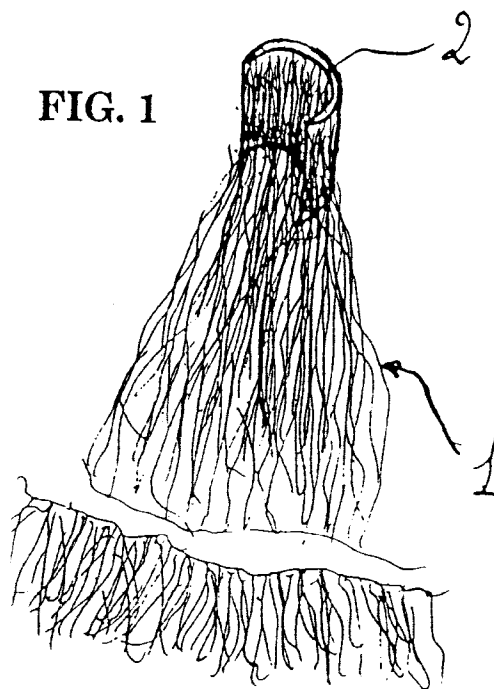


FIG. 1

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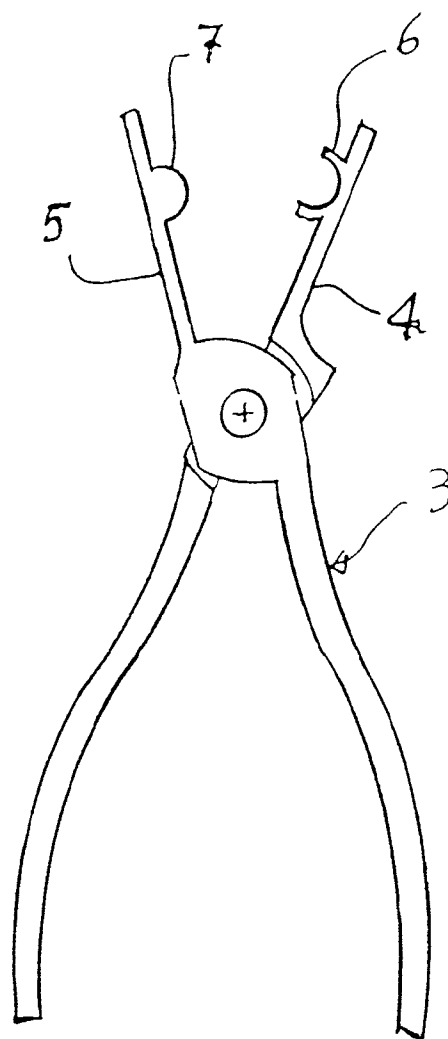


FIG. 2

Description

The present invention relates to a method of preparing hair extensions for creating hairstyles, a tool for the said method and an extension prepared by this method.

A number of currently fashionable hairstyles require the attachment to the person's natural hair of hair extensions in, for example, the form of ponytails, plaits and the like. These extensions are attached to the natural hair and removed from it as the wearer requires.

In current practice, these known hair extensions are prepared by bonding natural hair or artificial hair (the latter will also be called hair in this text), or the like, together at one end with a small quantity of adhesive substance, usually a thermoplastic resin. This operation is performed by holding the lock of hair in the fingers of one hand; the other hand then applies a drop of heated, and therefore fluid, resin onto the ends of the hair. The hairs are then worked and twisted between the fingers to form, with the consequent immediate hardening of the resin once it has cooled, a cylinder comprising resin and hair, similar to a slubbing or roving.

For use, the hair extension is heated with a suitable tool on the roving as prepared above and joined to the natural hair, or indeed to a wig, where desired.

The known method described above has many drawbacks, some to do with the use of the fingers alone in the preparation of the hair extension and others due to the resulting hair extension and its subsequent attachment to the wearer's hair.

More specifically, in the operation of bonding the ends of the hairs of the extension, the fingers tend to stick to the hair extension and the result is an irregular cylinder.

Moreover, contact between the operator's fingers and the resin can cause scalding and irritation of the skin and the known method is therefore not acceptable from the point of view of safety at work.

Lastly, in its practical application, a cylindrical roving of twisted hairs combines poorly with the person's own hair, creating an obvious visible contrast and an unnatural join.

The object of the present invention is therefore to overcome the abovementioned disadvantages.

More specifically, the present invention relates to a method of preparing hair extensions for creating hairstyles, in which a quantity of thermoplastic resin is applied in the fluid state to one end of a lock of natural or artificial hairs in order to bond them together to form a hair extension, forming a concave shell, similar in form to a fingernail, which is suitable for the subsequent accommodation in the abovementioned concavity of a lock of the wearer's own hair to which the hair extension is to be attached.

In addition, the method according to the invention is such as to comply with work safety standards.

According to the present invention, a method of pre-

paring hair extensions comprises the following steps:

- applying a drop of thermoplastic resin, made fluid by heating, to the ends of the hairs of the hair extension that is to be formed;
- placing these ends of the hairs with the applied drop of resin on a concave surface which is non-stick with respect to the thermoplastic resin;
- compressing the thermoplastic resin and the ends of the hairs between the concave surface and a corresponding convex surface that is likewise non-stick with respect to the thermoplastic resin;
- removing the ends of the hairs in contact with the thermoplastic resin which has been moulded into a concave shell similar in form to a fingernail, and which becomes rigid once the resin has cooled; and finishing the concave shell to the desired dimensions.

The invention additionally provides, for the preparation of hair extensions for creating hairstyles, a compressive moulding tool comprising a concave half or die and a convex half or punch, preferably made of a non-stick material with respect to the thermoplastic resin; the halves being movable towards each other to compress the end of the lock of hair in contact with the thermoplastic resin, and away from each other after compression and hardening.

For small-scale production, the moulding tool, preferably of manual type, is made from a pair of pliers or a bench press fitted with concave and convex moulding halves. For production on a larger scale, the tool may be equipped with motors and servocontrols allowing it to operate semi-automatically or automatically.

The present invention also provides a hair extension for creating hairstyles produced by the method of the invention, in which the hairs of a lock are bonded at one end in a concave shell of thermoplastic resin shaped like a fingernail.

The present invention will now be described with reference to a preferred embodiment, and on the basis of the figures of the attached drawings, wherein:

Figure 1 is an illustrative perspective view of the hair extension according to the present invention;

Figure 2 is a side view of a first embodiment of the tool according to the present invention;

Figure 3 is a partial side view of a second embodiment of the tool according to the present invention;

Figure 4 is a side view of a third embodiment of the tool according to the present invention;

Figure 5 is a section on A-A as marked in Figure 4; and

Figure 6 shows schematically a side view of a fourth embodiment of the tool according to the present invention.

The method of preparing hair extensions for creating hairstyles in accordance with the present invention provides for the application of a limited quantity of thermoplastic resin to one end of a lock of natural or artificial hairs in order to bond them together to form a hair extension. More precisely, a drop of thermoplastic resin, usually of the so-called "hot-melt" type (such as that marketed under the trade name Tubitrans Melt), made fluid by heating, is dropped onto the ends of the hairs of the hair extension that is to be formed, which latter is then placed on a concave surface to which the thermoplastic resin will not stick.

According to the present invention, the abovementioned concave surface is that of a die designed to engage, in a moulding operation, with a punch, the material of the latter also preferably being non-stick with respect to the thermoplastic resin, having a corresponding cylindrical surface. The die and punch are installed in a compressive moulding tool, which will be described later in a variety of embodiments shown in Figures 2 to 6. In order to make the moulding operation possible, the die and the punch are movable towards each other to compress the end of the lock of hair to which the thermoplastic resin has been applied and then away from each other after compression and hardening of the resin in a concave shape.

This concave die surface is preferably a portion of the lateral surface of a cylinder whose diameter is greater the greater the quantity of hair which the resin is to bond.

The portion of the lateral surface of the die is bounded by two cylindrical generatrices passing through the same semicircular base.

This serves to permit engagement between the die and the punch without the creation of undercuts that would be useless and damaging in the operation of removing the hair extension.

The hair extension is removed from the tool after the rapid cooling of the resin and its consequent hardening, and finished by limiting the length of the portion covered by the resin, as shown by way of example in Figure 1.

Referring to this Figure 1, the hair extension comprises a lock 1 of natural or artificial hairs, which can be straight or curly, loose or plaited, bonded at one end in a concave shell 2 consisting of hardened thermoplastic resin, roughly similar in form to a fingernail.

This shape is highly suitable for the subsequent attachment of the resulting hair extension to a person's hair. For this process the concave shell will be heated with a suitable tool and applied around a lock of the per-

son's own hair to form a special hairstyle, e.g. a ponytail, plait or the like, to which other embellishments may also be added.

When desired, the hair extension is removed in the conventional way by breaking up the resin-bound end with a suitable pair of pliers and applying a known liquid solvent, such as for example 90° ethyl alcohol or cosmetic acetone, to this broken up portion after which the hair extension is removed.

Figure 2 shows a first embodiment of a moulding tool for preparing a hair extension in accordance with the present invention, to which the general reference 3 is given. The moulding tool 3 is essentially a pair of pliers whose tips 4, 5 carry the concave moulding half or die 6 and the convex moulding half or punch 7, respectively.

As is clear, in this first embodiment of the tool the respective axes of symmetry of the die and punch 6, 7 (these axes are not indicated in the figure) are perpendicular to the plane containing the axes of symmetry of the tips 4, 5 of the pliers (these axes are also not indicated in the figure).

In order to prepare the hair extension, a drop of resin, heated until fluid, is applied to the end of the lock of hair, the hair extension is then laid in the die 6, and the tips 4, 5 are brought together, closing the pliers, and, after the resin has hardened, the tips are separated again. The hair extension can be taken out for finishing.

Figure 3 shows part of a second embodiment of a moulding tool in accordance with the present invention, having the general reference 30. The moulding tool 30 is once again basically a pair of pliers, the tips 40, 50 of which carry the die 60 and the punch 70, respectively. In this second embodiment of the tool, the respective axes of symmetry (not indicated in the figure) of the die and punch 60, 70 are coincident or parallel with the axes of symmetry of the tips 40, 50 of the pliers (once again these are not indicated in the figure). The punch 70 is essentially cylindrical while the die 60 comprises symmetrically extended walls 61 inclined slightly outwards relative to the inner portion 62 of the die. This facilitates the placing of the end of the lock of hair in the die 60.

The moulding operation is basically the same as for the first embodiment 3 of the tool, the only difference being the disposition of the lock of hair relative to the pliers.

Figures 4 and 5 show a third embodiment of a moulding tool in accordance with the present invention, under the general reference 300. The moulding tool 300 is basically a manual press and has a body 10 provided underneath with a clamp 11 for fixing it to a workbench (not shown).

On the top of the body 10 is an anvil 12 for a concave moulding half 400. A hand actuated bar 13 is hinged to the body 10 between two trunnions 14. For this purpose the bar 13 comprises a hub 15 mounted on a stationary pin 16 at the opposite end from the hand end.

The bar 13 carries a convex half or punch 500 mounted transversely in a position such as to arrive in

a moulding relationship with the concave half 400.

The moulding operation is basically the same as that performed with the first embodiment 3 of the tool as far as the disposition of the lock of hair relative to the tool is concerned. As is obvious, productivity and convenience of work are improved because the tool does not have to be held in the operator's hand.

A fourth embodiment of the moulding tool in accordance with the present invention is shown in Figure 6 under the general reference 301. Like the tool 300 described earlier, the moulding tool 301 is basically a manual press in which the advancing movement is provided by the operator by an arrangement similar to that usually used in a so-called sensitive drill. The tool 301 has a base 100 solid enough to keep it stable on a work surface and hold it in a fixed position throughout operation without the need for fixing means. Fixed vertically to the base 100 is a column 101, which may be a cylindrical column, supporting a rack 102. Mounted movably on the column 101 by two rear arms 170 and 171 that encircle the column 101 is a bracket 17. The stroke of the bracket 17 up and down the column 101 is limited by a shoulder 103 fastened to the column 101 in the gap between the rear arms 170 and 171 of the bracket 17. Sitting between the mutually confronting surfaces of the shoulder 103 and the rear arm 170 is a helical spring 18. An actuating lever 19, with a hand grip 20 at the end (shown partially), is hinged in a known way to the bracket 17 with a pinion (not shown) engaging with the rack 102. Mounted on the front of the bracket 17, by means of a vertical post 172, is a ram plate 21 held above an opposing plate 22 fixed to the base 100. The plate 22 has integral vertical guide pins 201, 202 for the ram plate 21, and the latter has corresponding through holes for the vertical pins 201, 202. Fitted between the plate 22 and the ram plate 21 is a helical spring 23. Fixed vertically to and downwards from the ram plate 21 is a prismatic component 24, its major axis being perpendicular to the plane of the drawing paper, with a convex U-profile punch 25 in its free end. Corresponding to this, the plate 22 supports a prismatic component 26, its major axis similarly perpendicular to the drawing paper, with a concave die 27 of identical U profile in its free end.

The moulding operation is very much the same as that performed with the tool of the third embodiment illustrated in Figures 4 and 5.

One end of the hair extension, to which the thermoplastic resin has been applied, is laid in the cavity of the concave die 27. The operator, acting on the lever 19 against both opposing springs 18 and 23, brings the punch 25 down onto the die 27 and compresses the resin and the ends of the hairs between their respective convex and concave surfaces.

The punch 25 is withdrawn from the die 27 by the action of the opposing springs and the hair extension is removed.

The advantages are obvious, not only when compared with the pliers versions shown in Figures 2 and 3,

but also when compared with the tool fitted with the clamp as shown in Figures 4 and 5.

The tool 301 in the fourth embodiment can be conveniently moved to where it is needed without time being wasted on installation.

In this tool the punch is introduced into the die with a rectilinear motion rather than a rotary one. This makes the moulding symmetrically uniform and produces a shell of more even thickness.

Removal from the mould is automatic because of the opposing springs, as soon as the operator releases the actuating lever 19. This reduces processing time.

Although the compressive load employed in moulding the portion of hair with resin is not excessive, it is still reduced by the engagement of the pinion and rack pair connected to the actuating lever, as compared with a lever that is simply hinged as in the third embodiment.

The lengthened design of the U profile of the punch 25 and of the die 27, combined perpendicularly with the prismatic components 24, 26 that carry them, allows accurate moulding without flash. This is advantageous because the time necessary for finishing is reduced.

The greater depth of the die, together with its length in the perpendicular direction, improves and facilitates the positioning of the end of the hair extension. It also means that a larger quantity of hair can be accommodated and therefore thicker hair extensions can be obtained.

The greater length in the perpendicular direction of the die and punch enables the shell to be reduced subsequently to the desired dimension.

As stated earlier, it is easy, without departing from the scope of the invention, to devise partly or fully automatic motorized equipment capable of executing the same moulding operation for the preparation of hair extensions by the method of the invention.

The present invention has been described with reference to certain currently preferred embodiments thereof, but it will be understood that practical alterations and modifications may be made by those skilled in the art without departing from the scope of protection of this intellectual property document.

Claims

1. Method of preparing hair extensions for creating hairstyles, in which a quantity of thermoplastic resin is applied in the fluid state to one end of a lock of natural or artificial hairs in order to bond them together to form a hair extension, characterized in that it comprises the following steps:

- applying a drop of thermoplastic resin, made fluid by heating, to the ends of the hairs of the hair extension that is to be formed;
- placing these ends of the hairs with the applied

drop of resin on a concave surface which is non-stick with respect to the thermoplastic resin;

- compressing the thermoplastic resin and the ends of the hairs between the concave surface and a corresponding convex surface that is likewise non-stick with respect to the thermoplastic resin; 5
- removing the ends of the hairs in contact with the thermoplastic resin which has been moulded into a concave shell similar in form to a fingernail, and which becomes rigid once the resin has cooled; and 10
- finishing the shell to the desired dimensions. 15

2. Method according to Claim 1, characterized in that the thermoplastic resin is of the so-called hot-melt type. 20

3. Tool for preparing hair extensions for creating hairstyles according to the method of Claim 1, characterized in that it is a compressive moulding tool comprising a concave half or die and a convex half or punch, preferably made of a non-stick material with respect to the thermoplastic resin; the halves being movable towards each other to compress the end of the lock of hair in contact with the thermoplastic resin, and away from each other after compression and hardening of the resin. 25

4. Tool according to Claim 3, characterized in that the said moulding tool is a pair of pliers, one of whose tips carries the concave moulding half and the other the convex moulding half, these halves having respective axes of symmetry coinciding with the axes of symmetry of the tips of the pliers. 30

5. Tool according to Claim 3, characterized in that the said moulding tool is a pair of pliers, one of whose tips carries the concave moulding half and the other the convex moulding half, these halves having respective axes of symmetry perpendicular to the plane containing the axes of symmetry of the tips of the pliers. 35

6. Tool according to Claim 3, characterized in that the said moulding tool is a manual press having a body provided underneath with a clamp for fixing it to a workbench, while on top is an anvil for the concave moulding half and a hand actuated bar hinged to the body and carrying the convex moulding half in a position such as to arrive in a moulding relationship with the concave half. 40

7. Tool according to Claim 3, characterized in that the 45

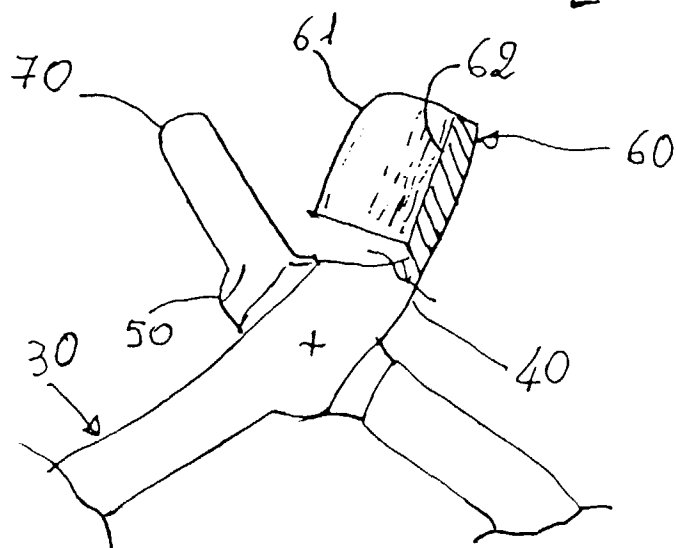
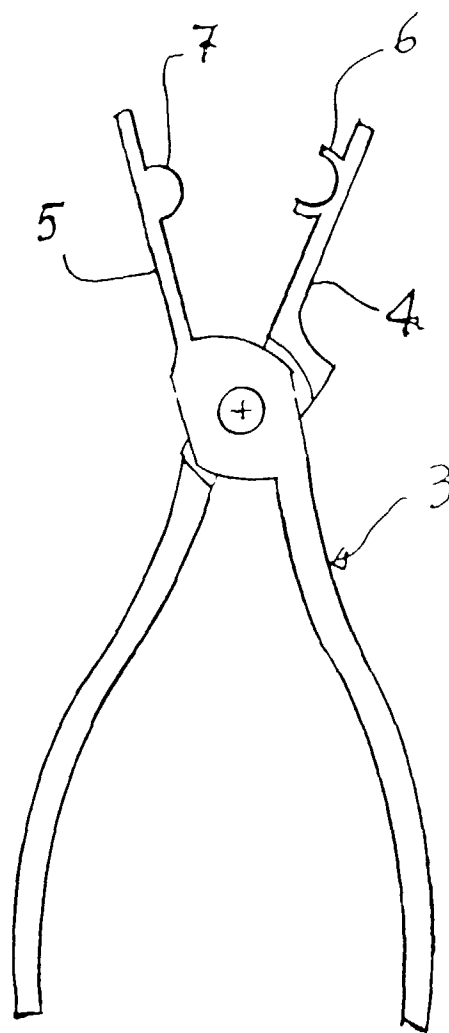
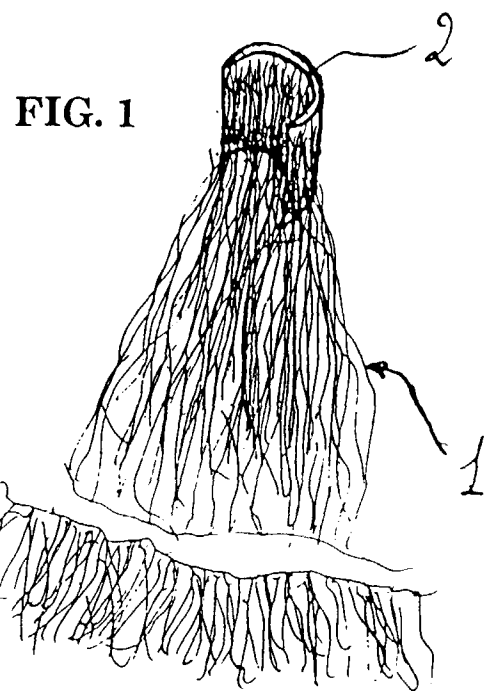
said moulding tool is a manual press comprising:

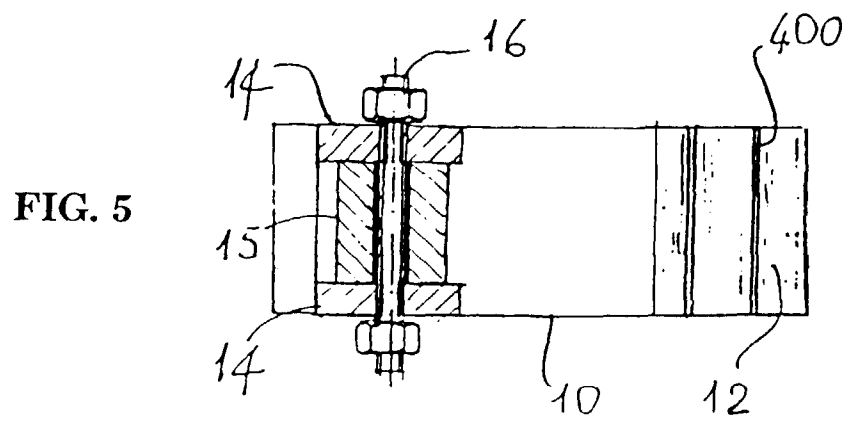
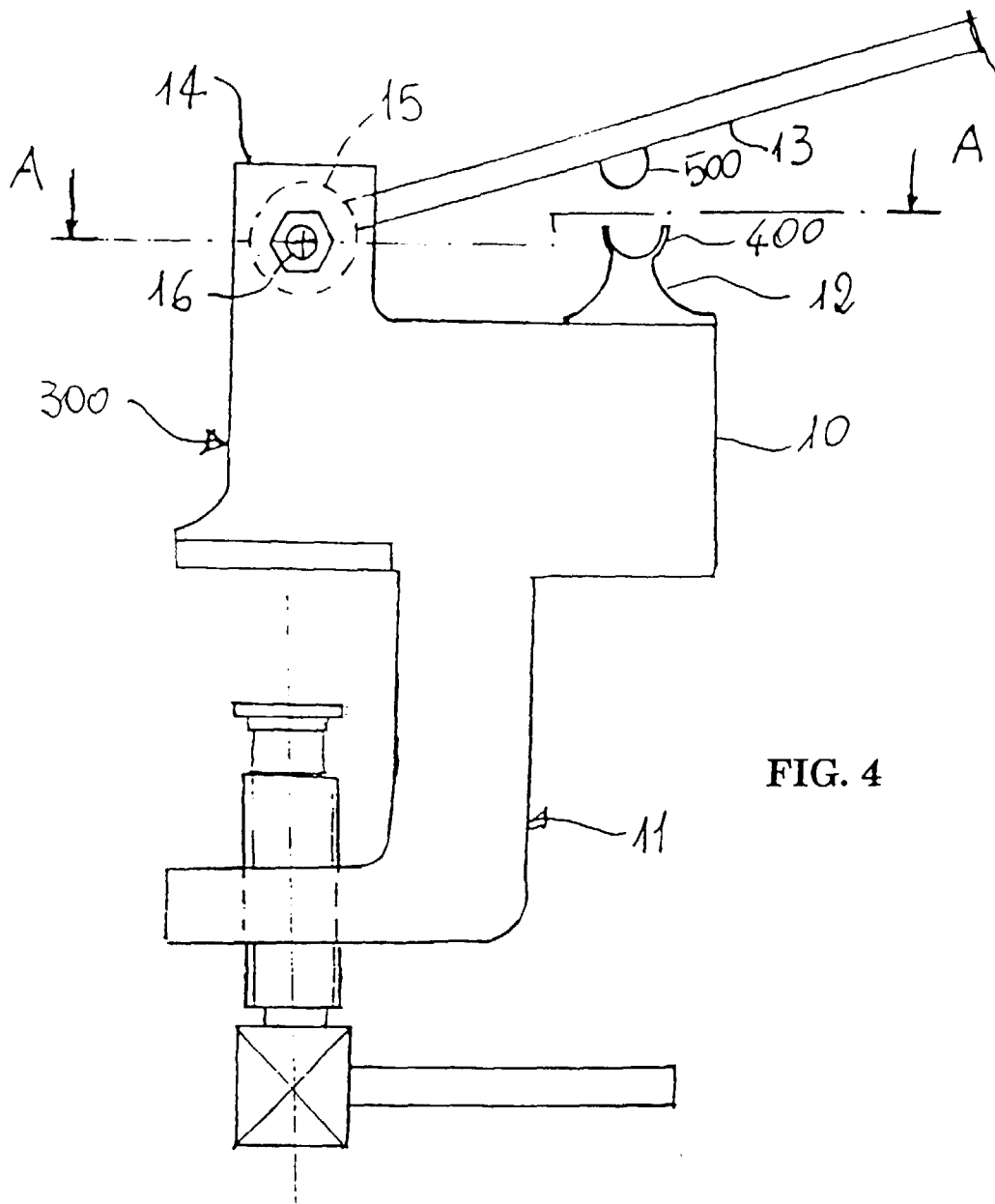
- a supporting base,
- a column fixed vertically to the base and supporting a rack,
- a bracket with two rear arms by which it is mounted on the column, and able to move in a spring-loaded stroke limited by a shoulder fastened to the column in the gap between the rear arms of the bracket,
- a hand actuated lever hinged to the bracket and having a pinion engaging with the column rack, and
- a ram plate having a U-shaped convex punch, mounted at the front, on the bracket, above a plate that comprises a U-shaped concave die and is fixed to the support base. 50

8. Tool according to Claim 7, characterized in that the plate has integral vertical guide pins for a spring-loaded stroke of the ram plate, which contains through holes corresponding to the pins. 55

9. Tool according to Claim 7, characterized in that the die and the punch are attached to the plate and ram plate, respectively, on respective prismatic components.

10. Hair extension for creating hairstyles, produced by the method of Claim 1, characterized in that it has a lock of hair bonded at one end in a concave shell of thermoplastic resin shaped like a fingernail.





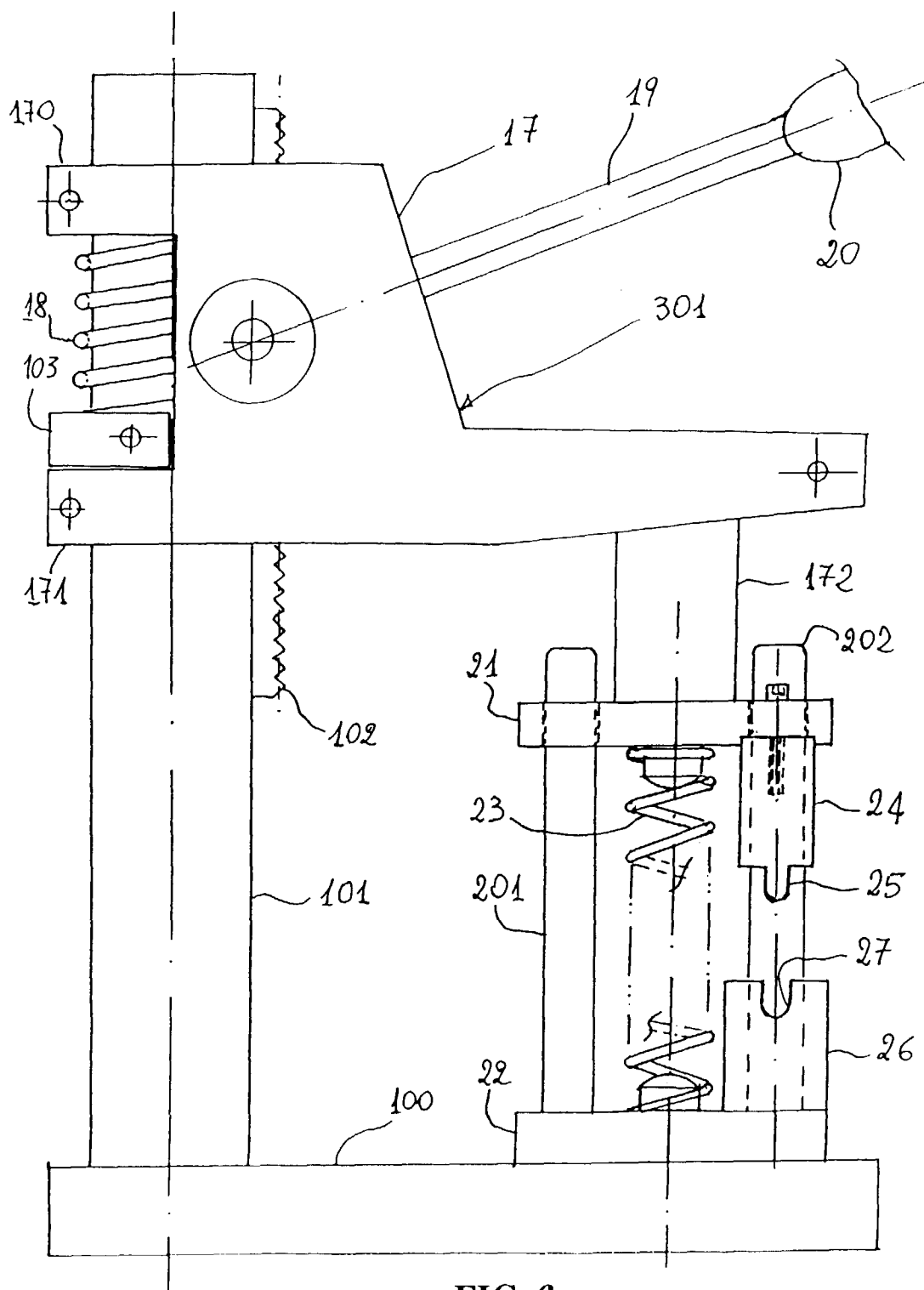


FIG. 6



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 98 83 0205

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	US 4 934 387 A (SALVATORE MEGNA) 19 June 1990 * figures 1-7 *	1	A41G3/00
A	EP 0 760 215 A (FELIX TRAUTINGER) 5 March 1997 * the whole document *	1	
A	US 4 982 748 A (ADRIANA L. TRIMARCHI) 8 January 1991		
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			A41G A45D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 22 July 1998	Examiner Fairbanks, S
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