



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁵ : A45D 26/00, B26B 13/14	A1	(11) International Publication Number: WO 92/00688 (43) International Publication Date: 23 January 1992 (23.01.92)
--	-----------	--

(21) International Application Number: PCT/IT91/00058
 (22) International Filing Date: 8 July 1991 (08.07.91)
 (30) Priority data:
 83625 A/90 10 July 1990 (10.07.90) IT

(71) Applicant (for all designated States except US): S.E.R.P.A.T. S.R.L. [IT/IT]; Via Maspero, 27, I-21100 Varese (IT).

(72) Inventor; and

(75) Inventor/Applicant (for US only) : CARON, Giovanni [IT/IT]; Via Sabotino, 5, I-21100 Varese (IT).

(74) Agents: PELLEGGRI, Alberto et al.; Società Italiana Brevetti S.p.A., Via Cavour, 9, I-21100 Varese (IT).

(81) Designated States: AT (European patent), AU, BE (European patent), CA, CH (European patent), DE (European patent), DK (European patent), ES (European patent), FR (European patent), GB (European patent), GR (European patent), IT (European patent), JP, LU (European patent), NL (European patent), SE (European patent), US.

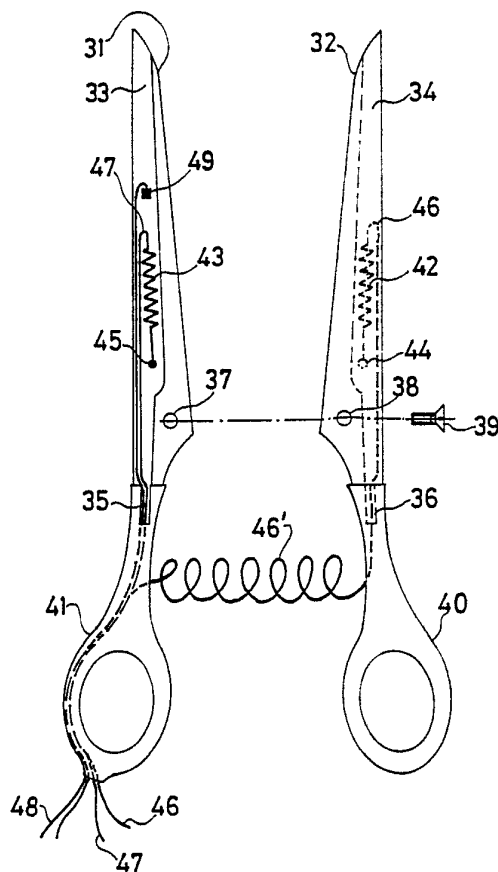
Published

With international search report.
With amended claims.

(54) Title: INSTRUMENT FOR CUTTING HAIR AND SIMULTANEOUSLY CAUTERIZE THE CUT HAIR ENDS

(57) Abstract

An instrument for cutting hair, especially a pair of scissors (1), has an electrically heated blade capable of being heated to a temperature comprised between 150 and 300 °C. The instrument is used for cutting hair while simultaneously cauterizing the cut hair ends. This high temperature cutting treatment has been found to be effective in reducing or eliminating the tendency of hair to bifurcate. A preferred embodiment describes a pair of scissors having heating resistances (42, 43) installed in recesses (33, 34) of both blades (31, 32) and a thermocouple (49) for controlling the actual blade temperature wherein the electrical connection to a control console (50) is made through a single cable termination of only one of the two blades of the scissors for enhanced freedom in using the scissors.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	ES	Spain	MG	Madagascar
AU	Australia	FI	Finland	ML	Mali
BB	Barbados	FR	France	MN	Mongolia
BE	Belgium	GA	Gabon	MR	Mauritania
BF	Burkina Faso	GB	United Kingdom	MW	Malawi
BG	Bulgaria	GN	Guinea	NL	Netherlands
BJ	Benin	GR	Greece	NO	Norway
BR	Brazil	HU	Hungary	PL	Poland
CA	Canada	IT	Italy	RO	Romania
CF	Central African Republic	JP	Japan	SD	Sudan
CG	Congo	KP	Democratic People's Republic of Korea	SE	Sweden
CH	Switzerland	KR	Republic of Korea	SN	Senegal
CI	Côte d'Ivoire	LI	Liechtenstein	SU	Soviet Union
CM	Cameroon	LK	Sri Lanka	TD	Chad
CS	Czechoslovakia	LU	Luxembourg	TG	Togo
DE	Germany	MC	Monaco	US	United States of America
DK	Denmark				

-1-

INSTRUMENT FOR CUTTING HAIR AND SIMULTANEOUSLY CAUTERIZE THE CUT HAIR ENDS

The present invention relates to an instrument for cutting hair, as one of the instruments which are normally used by hairdressers, capable of simultaneously cauterize the cut hair ends.

Until now there has not been any relation among the functions performed by means of conventional scissors by hairdressers and other conservatory acts which are performed on hair by means of other specialized instruments, in particular for preventing the growth of bifurcated hair ends, which is a frequent but not exclusive concern of women keeping relatively long hair. It has been heretofore a common practice of hairdressers to cure the tendency of hair to bifurcate by flame treating the hair, using a candle or a special torch. These treatments are time consuming and unpleasant to both the customer-patient and the operator, moreover the risks of inadvertently overdaming the hair or to accidentally cause more serious damages is attendant.

A main objective of the present invention is to provide an instrument for simultaneously cauterize the cut hair ends while cutting hair in a safe and effective manner, while causing the least uncomfot to the customer.

These objectives and other advantages are achieved by means of the instrument object of the present invention which consists in a hair cutting instrument having, under this aspect a substantially common configuration, while the cutters or the cutter thereof is electrically heated to a temperature comprised in the range of 150°C and 300°C for cauterizing the hair being cut by the blade.

It has been found that hair cut with a blade held at such a high temperature show a markedly reduced tendency to bifurcate upon growth and the hair comparatively appear to benefit overall from the high temperature cut treatment, by developing an improved glossy appearance and an overall reinvigoration. These positive effects may be attributed to the simultaneous cauterization of the cut produced in the hair which prevents a tendency of the hair to desquamate or to "loosen"

at the freshly produced cut which may originate degenerative processes such as the bifurcation of the hair and the like. In this respect, the high temperature cut produced by the instrument of the present invention may be seen as providing a positive aseptic "sealing" of the cut which prevents degenerative effects after the cutting.

According to a first embodiment of the invention, the instrument is a pair of scissors, at least a blade or preferably both blades of which are heated. However other embodiments may be in the form of single blade hair cutting instruments such as a razor and also of a comb-razor, as often used by hairdressers in place of scissors for performing special hairdressings. The cutter or the cutters, as the case may be, are preferably heated by electrical heaters which are preferably set into an especially designed blade holder portion of the instrument in order to generate the required heat as close as possible to the cutting edge. Most preferably the instrument has heater elements incorporated therein and connected to a low voltage power supply through an insulated cable and most preferably the instrument is also provided with a thermocouple set in proximity of the heated blade and which is connectable through the same (multiconductor) insulated cable to a temperature control unit in order to maintain the cutting blade or the cutting blades to a presettable constant temperature during the utilization of the hair cutting instrument. The temperature control-power supply unit may be combined in a wheeled caddie and be provided with a panel including all the control and temperature preselection switches and with a display for monitoring the correct temperature to which the cutters are heated.

The different aspect and advantages of the haircut instrument of the present invention will be more easily appreciated through the following detailed description of several embodiments and reference to the attached drawings, wherein:

Figure 1 is a schematic partial representation of a pair of scissors having an electrically heated cutter in accordance with the present invention;

Figure 2 is an enlarged partial cross sectional view in the plane II-II indicated in Fig. 1 of one blade of the scis-

sors incorporating an electrical heating element;

Figure 3 is an enlarged partial cross sectional view in the plane III-III indicated in Fig. 1;

Figure 4 is a schematic perspective view of a stand-by receptacle for the electrically heated scissors of Fig. 1, equipped with a temperature sensor for controlling the heating of the scissors during stand-by periods;

Figure 5 is a schematic perspective view of a complete apparatus;

Figure 6 is a view of a pair of scissors with heated blades according to a further embodiment of the present invention;

Figure 7 is a schematic representation of the heated scissors of Fig. 6;

Figure 8 is a perspective view of a caddie-mounted apparatus of the invention;

Figure 9 is a schematic partial perspective view of a razor with a heated blade;

Figure 10 is an illustrative view of a comb-razor with electrically heated cutters.

With reference to Figures 1 to 5, a pair of scissors 1 conventionally comprises two blades 1' and 1", pivoted together by means of a screw pivot 11.

According to the present invention, at least one blade or knife of the scissors is heated, at least in correspondence of a cutter piece 10. The cutter 10 is preferably replaceable and may be fixed to respective the blade holder, knife body 1" of the scissors by means of several screws 14. The knife 1" has a recessed portion wherein a flat strip heating resistor 2 is disposed, preferably by interposing a layer of thermally insulating material 22 having a suitably "L"-shaped cross section, in order to reduce heat dispersion through the knife 1" of the scissors and to minimize the power which is necessary for heating the cutter 10 having a sharpened cutting edge 10'.

The heads of the screws 14 for fastening the cutter are received into purposely stepped holes 13 formed through the cutter piece 10, which holes are preferably made with a certain clearance in order to create a space which may be filled

-4-

with a thermally insulating paste 134, when mounting the cutter. The sleeve of thermally insulating cement 134 will avoid the formation of thermally conductive "bridges" through the assembling screws 14.

The heating resistor 2 is powered through two conductors 20 and 20' which may be laid into a purposely created channel, cut in the handle portion of the scissors, and the electrically insulated conductors 20 and 20' may be permanently set in the channel by means of a potting compound.

An insulated, two-conductor, power-supply cable departs from the handle portion of the scissors and, in the case that both blades of the scissors are electrically heated, the two pairs of conductors emerging from each handle portion of the two knives of the scissors may be electrically connected together in parallel or in electrical series and through a single power-supply cable 21 provided with an end plug 22, the heating resistances may be powered by connecting the plug 22 into an output socket of a power supply 5 which may comprise, as shown, a transformer 5' and an electronic circuitry with an adjusting potentiometer 55, for providing an appropriate power supply in order to attain the desired temperature which may be programmed by means of the knob 55, and controlled by a temperature sensing system 66-66'-66" during stand-by periods. In Figures 4 and 5 is also depicted a stand-by scissors holder 6 in the form of a receptacle into which the scissors may be inserted during pauses of the hair cutting work. The scissors holder 6 has a top opening 6' and is provided inside with scissors rests 60, 61, 62 and 63, with a thermostat 66" and with a microswitch 65 for confirming to the control circuit the insertion of the scissors in the stand-by holder. As shown in Fig. 5, the microswitch is connected to the power supply through the cable 65' and the thermostat 66" is connected by the cable 66' to a temperature controlling switch 66. According to this embodiment, the user adjusts the desired temperature of the cutters of the scissors by setting the knob 55. After the scissors have attained the desired temperature, which is normally comprised between 150°C and 350°C, preferably between 180°C and 230°C, the scissors may be used for cutting hair which are desirably cauterized by

the contact with the heated cutters of the scissors. During stand-by periods, the scissors may be placed in the holder 6 and by means of the presence confirmation given by the microswitch 65, the temperature of the scissors becomes thermostatically controlled and the control switch 66 provides to interrupt the power supply to the heating resistances when the temperature sensed by the thermostat 66" becomes higher than a preset value. This prevents overheating during stand-by periods and has a power saving function.

According to a preferred embodiment of the invention, a pair of scissors has both cutters heated by heating resistances set in the cutter holding portion of both knives of the scissors in order to promote a most effective cauterizing action during the cutting of hair, and the scissors are also provided with a thermocouple or similar temperature sensor set near at least one of the heated cutters in order to im--plement a precise and constant temperature control through an appropriate electronic circuitry. Moreover according to such a preferred embodiment, the cable connection between the scissors and the temperature controlled power supply unit is advantageously made by means of a single cable connection through only one of the two handle portions of the scissors. This permits a freer use of the scissors without the hindrance which is inevitably created by having electric cable connections departing from both handle portions of the scissors.

The problem of providing the necessary electric current path through the two heating resistances set in the two pivoted blade portions of the scissors, has been successfully resolved by exploiting the pivoting screw of the scissors as part of the electric path and by utilizing the metal bodies of the scissors also as part of the electric path.

The scissors made in accordance with this preferred embodiment are shown in Fig. 6, 7 and 8. As schematically shown in Fig. 7, the scissors comprise two similar metallic blade holding portions 31 and 32, having a recess on their opposing faces, 33 and 34, respectively. The metallic blade-holding portions have a tail shaped termination, 35 and 36, respectively, and a hole for a pivot screw, 37 and 38, respectively.

Customarily the hole 37 of the blade holder 31 is threaded while the hole 38 of the blade holder 32 has a diameter of a sufficient clearance for a pivot screw 39 to pass through.

The handle portion of both knives of the scissors, 40 and 41, respectively, are made of a moldable plastic material having a low heat conductivity and are permanently joined to the metallic blade-holding portions 31 and 32; the joint being reinforced by the tail terminations 35 and 36.

Within the receptacles 33 and 34 are installed the heating resistances 42 and 43. Each resistance has one end soldered or otherwise electrically connected to the respective metallic blade holder body, respectively at 44 and 45. Each resistance is connected at its other end to an insulated conductor, 46 and 47, respectively. These insulated wires permit the connection of the heating elements to the power supply outlet. In the left hand knife of the scissors, the insulated wire 47 runs along the recess 33, housing the resistance 43, and passes through the conduit purposely formed in the molded plastic handle portion 41 to emerge through a hole at the end of the handle portion. The insulated wire 46 of the other knife of the scissors runs into the recess 34, housing the resistance 42, and passes through a conduit purposely formed in the molded plastic handle portion 40 and emerges through a hole in a neck portion of the handle. The insulated conductor forms several elicoidal turns before entering through a hole in the neck portion of the opposite handle portion of the scissors and passing through a channel purposely formed within the molded plastic body to emerge, together with the other isolated wire 47, through the same hole of the handle portion of the left hand knife of the scissors.

A two-conductor, insulated cable 48 is similarly passed through the same channel of the plastic portion and disposed in the recess 33 and the two conductors terminate with a thermocouple junction 49 which is suitably disposed as near as possible to the respective heated cutter of the scissors. The electric current path through the heating resistors 42 and 43 comprise the metallic body of both blade holder portions of the scissors, electrically connected together by the conducting pivoting pin 39 and the looped portion 46' of the

insulated wire 46. In this way the electric circuit is closed while having a cable connection to only one of the two handle portions of the scissors. This arrangement gives a greater freedom to the user of the scissors by eliminating the hindrance represented by having cables departing from both handle portions. The assembled scissors are depicted in Fig. 6. The bridging looped portion 46' is conveniently made with a single isolated wire of a particularly elastic material and does not hinder the use of the scissors.

The use of a thermocouple 49, capable of sensing the exact temperature of the cutters of the scissors, permits the implementation of a constant precise temperature control by means of an electronic circuitry. In this way the power supply to the heating resistances may be automatically modulated so as to maintain a predefined constant temperature of the cutters in any condition of use and of stand-by of the scissors.

The electronic control and power supply may be arranged on a wheeled caddie, as shown in Fig. 8, which may be provided with a control panel 50 containing all the controls and displays for regulating and monitoring the temperature of the cutters.

The invention may also be embodied in a form different from the most common scissors. For example, the same cauterizing action on the hair being cut may be effected by means of a razor type instrument as the one depicted in the schematic partial view of Fig. 9. According to this embodiment, a razor blade 51 may be mounted on a special blade holder 52 containing an electric heating element 53 and preferably a temperature sensing thermocouple (not shown in the figure) for controlling the temperature of the blade 51.

Fig. 10 depicts yet another embodiment of the instrument object of the present invention, in the form of a "comb-razor" 54. This hair cutting instrument, has heated blades 55 between the teeth of the comb. Also in this case the blades 55 may be heated to the desired temperature by an electric heating element provided within the body of the instrument.

C L A I M S

1. An instrument for cutting hair and simultaneously cauterize the cut hair ends which comprises at least an electrically heated blade, capable of being heated to a temperature comprised between 150°C and 300°C.

2. An instrument as defined in claim 1, characterized by the fact that the instrument is a pair of scissors.

3. The scissors as defined in claim 2, wherein both blades of the scissors are electrically heated.

4. An instrument as defined in claim 1, characterized by being a razor.

5. An instrument as defined in claim 1, characterized by being a comb-razor having a heated blade between the comb's teeth.

6. An instrument as defined in claim 1, characterized by comprising at least a thermocouple, functionally mounted near said heated blade of the instrument, which is connected to a temperature control unit for regulating the blade temperature.

7. The scissors as defined in claim 3, wherein each of the two opposing metallic knives, which are pivoted together, have a handle portion made of an electrically and thermally insulating material;

the two metallic knives of the scissors have a recess which is covered by a replaceable cutter piece fixed by screws to the relative knife portion of the scissors;

an electric heating resistor is placed inside said recess of each knife portion of the scissors, one terminal of each heating resistor being electrically connected to the respective knife portion of the scissors and the other terminal of each heating resistor being electrically connected by means of an insulated cable to one respective pole of a low

voltage power supply outlet;

the electrical current path including a metal pivot of the scissors.

8. The scissors as defined in claim 7, wherein the cable connection to the power supply departs from said handle portion of only one knife of the scissors;

the electric current path to the heating resistor of the other knife of the scissors comprising further a bridging electric connection arranged between the pivot point and the handle portion of the two knives of the scissors.

9. The scissors as defined in claim 8, wherein said bridging electric connection comprises a spiral wound insulated cable portion capable of stretching and being compressed back during the use of the scissors.

AMENDED CLAIMS

[received by the International Bureau
on 9 December 1991 (09.12.91):

original claims 1-9 replaced by amended claims 1-4 (2 pages)]

1. Scissors for cutting hair and simultaneously cauterize the cut hair ends, characterized by the fact that the scissors comprise two knives, each having a handle portion and a metallic, recessed, blade-holder portion;
a heating resistor set in a recess of said blade-holder portion of each knife;
a replaceable blade, functionally mounted on the blade-holder portion of each knife, the mounted blade covering said recess and being heated by said heating resistor set in the recess;
at least a heat sensor, set in a recess of at least one of said knives, and capable of sensing the temperature of the blade heated by said heating resistor; and
control means, driven by said heat sensor, electrically powering said heating resistors for heating said blades to a selectable temperature.

2. The scissors as defined in claim 1, wherein said heating resistors are electrically connected in series with each other through a metallic pivot of the scissors.

3. The scissors as defined in claim 2, wherein an insulated cable connection to a temperature controlled power supply console departs from the handle portion of only one knife of the scissors;

the electric current path to the heating resistor of the other knife of the scissors comprising further a bridging electric connection arranged between the pivot point and the handle portion of the two knives of the scissors.

-11-

4. The scissors as defined in claim 3, wherein said bridging electric connection comprises a spiral wound insulated cable portion capable of stretching and being compressed back during the use of the scissors.

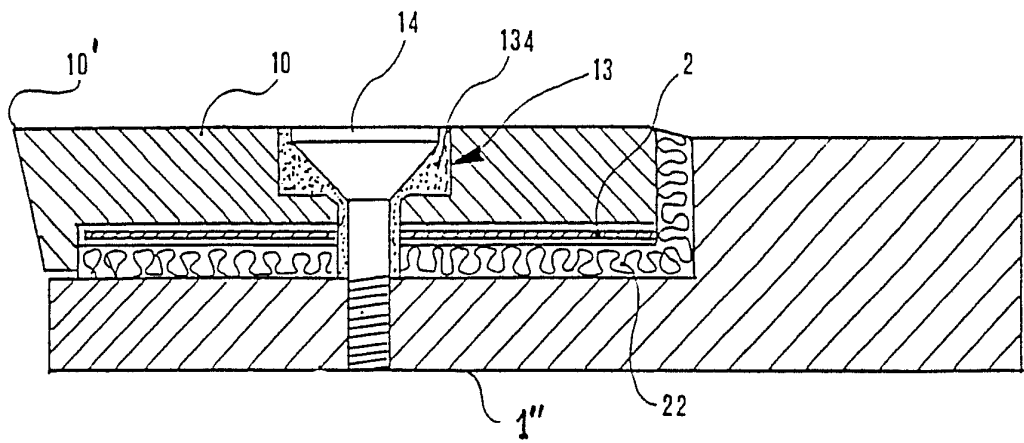


FIG. 2

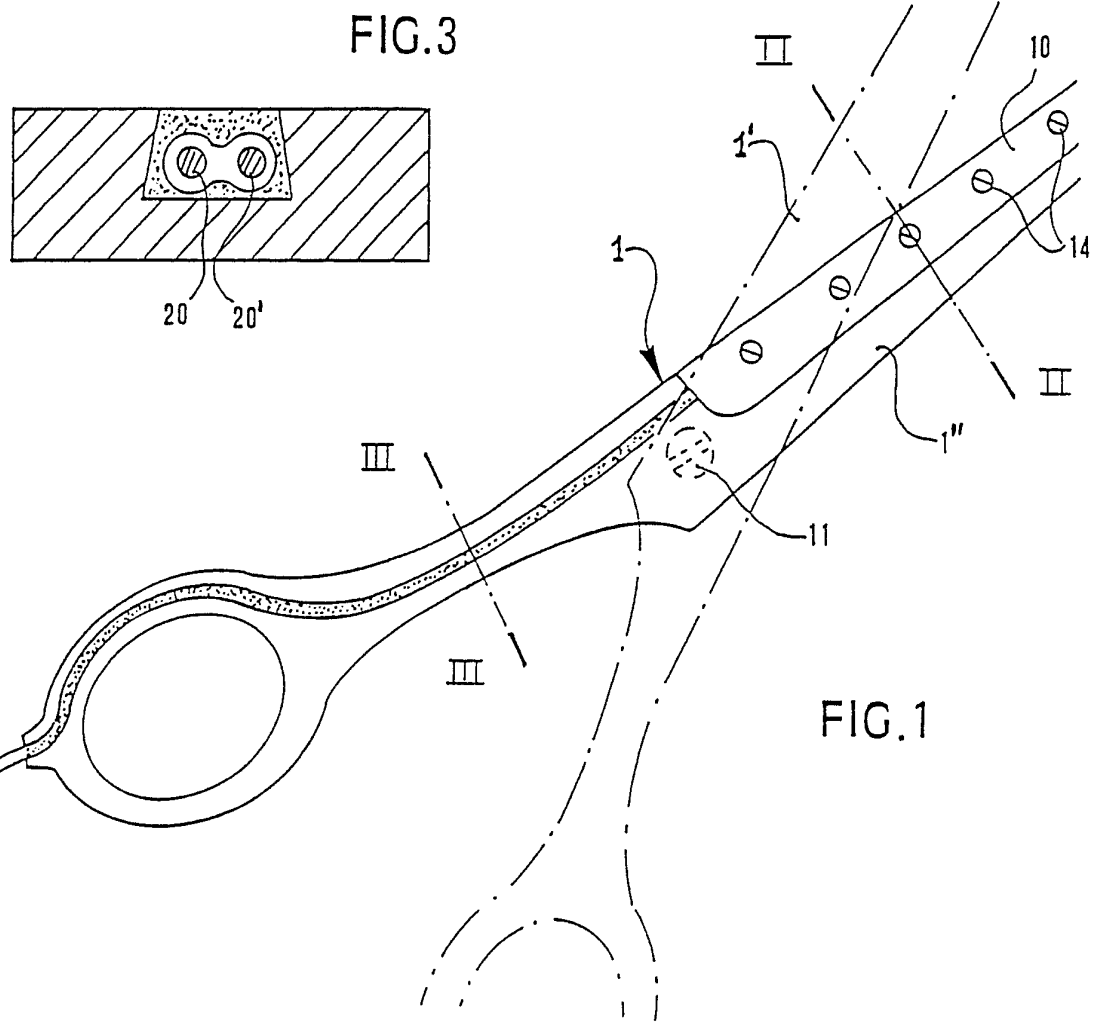


FIG. 3

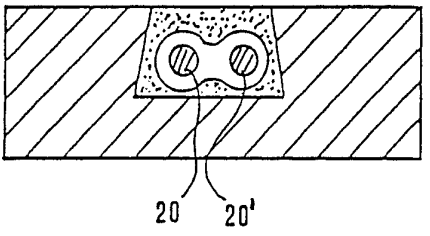


FIG. 1

FIG.4

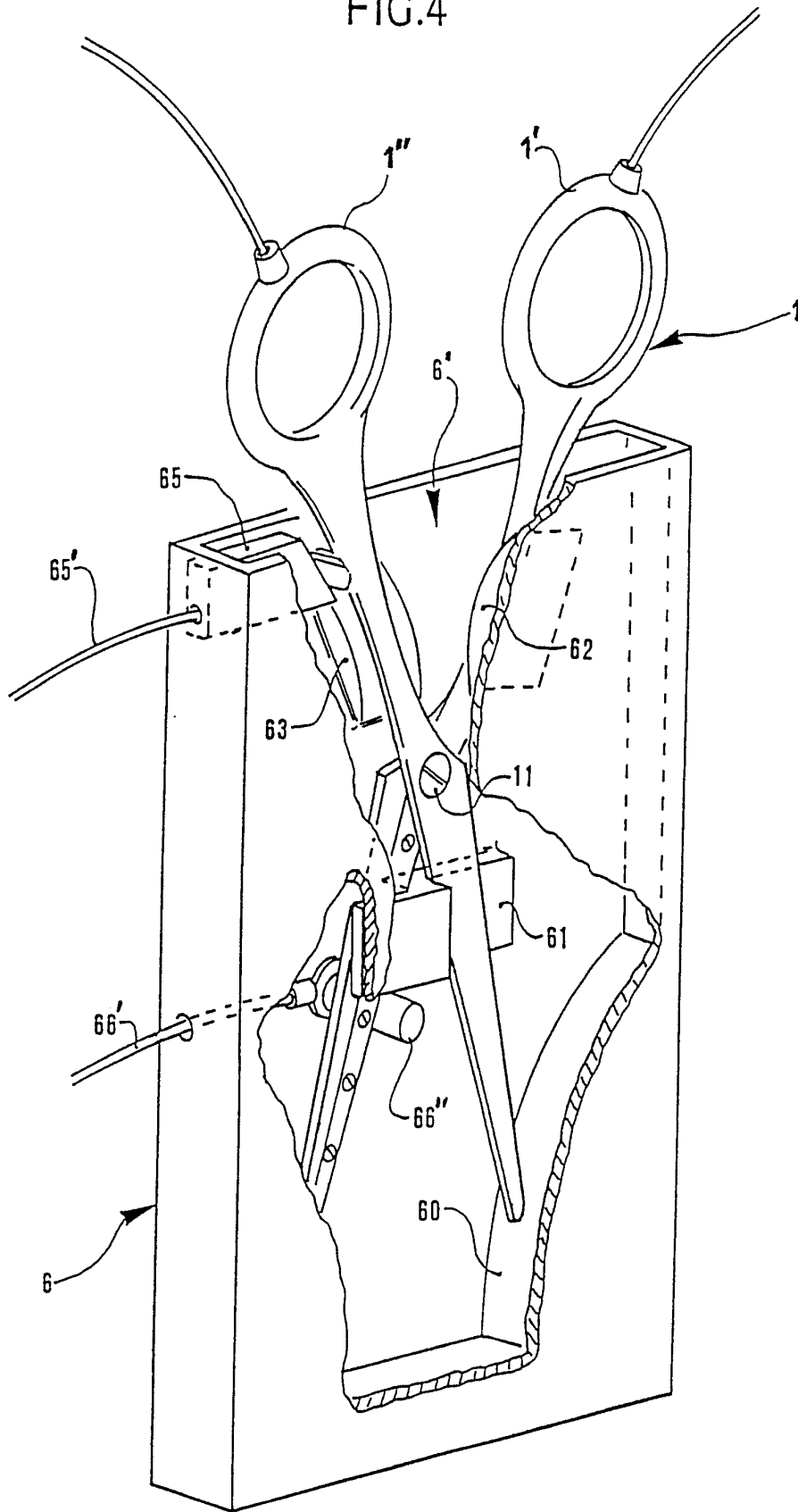


FIG. 5

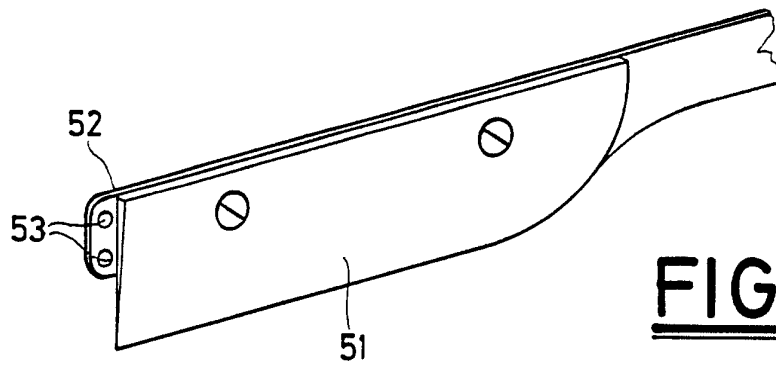
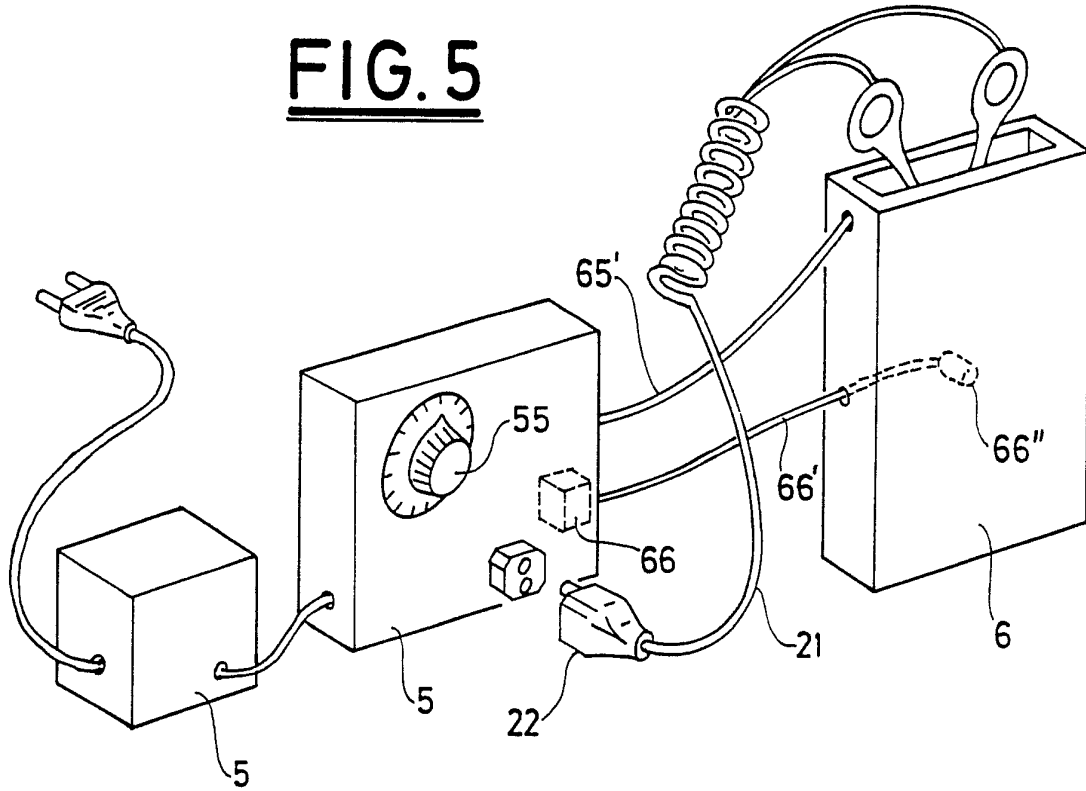


FIG. 9

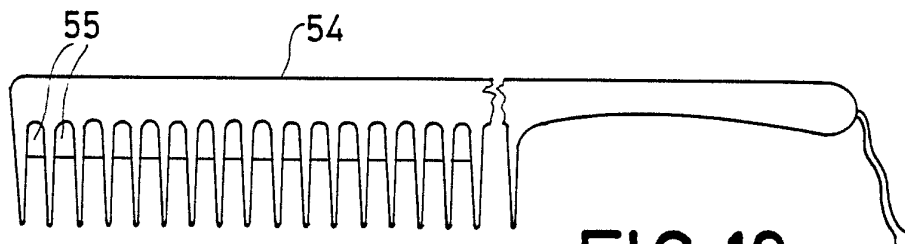


FIG. 10

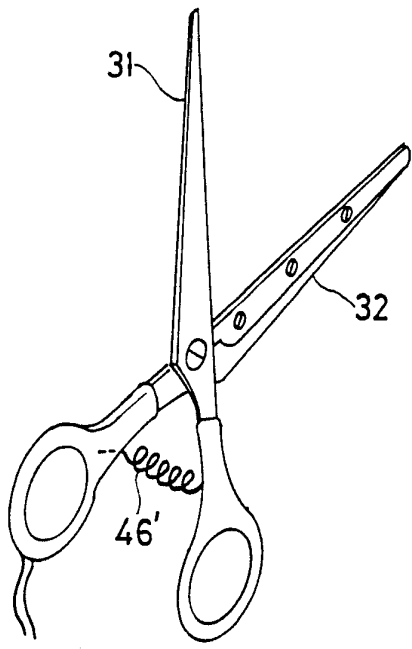


FIG. 6

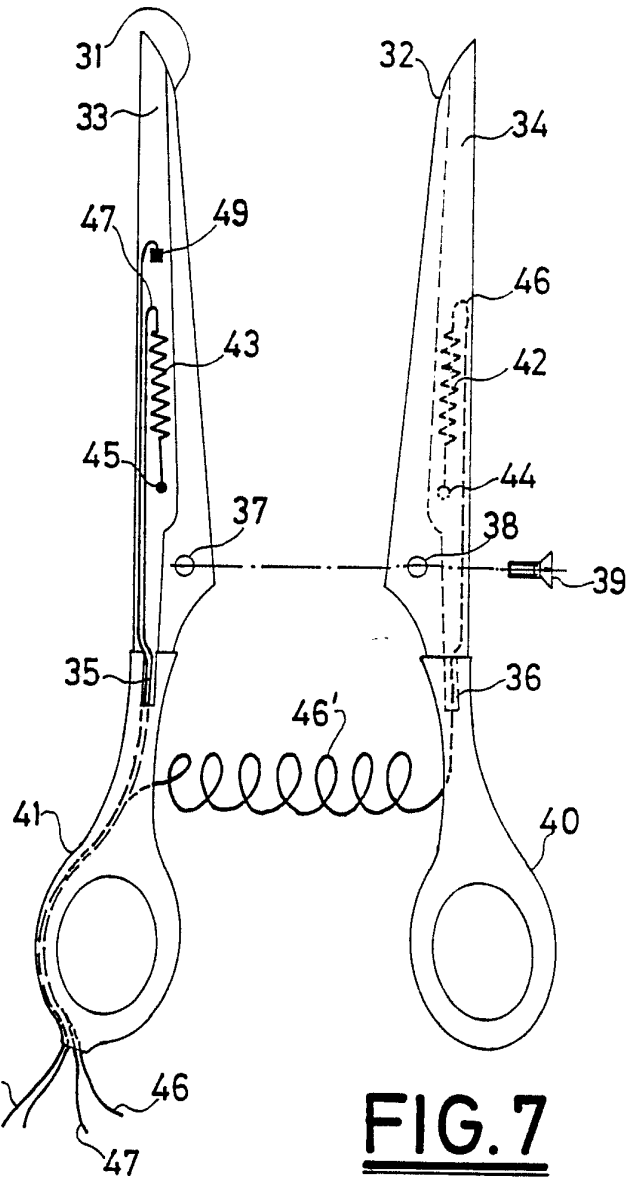


FIG. 7

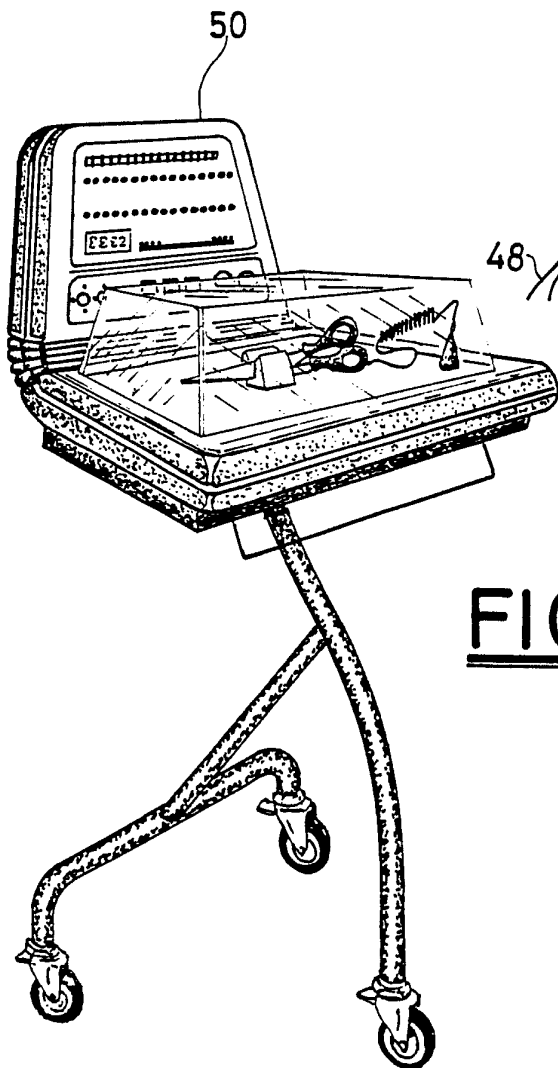


FIG. 8

INTERNATIONAL SEARCH REPORT

International Application No

PCT/IT 91/00058

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ⁶				
* According to International Patent Classification (IPC) or to both National Classification and IPC Int.C1.5 A 45 D 26/00 B 26 B 13/14				
II. FIELDS SEARCHED				
Minimum Documentation Searched ⁷				
Classification System	Classification Symbols			
Int.C1.5	A 45 D B 26 B			
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸				
III. DOCUMENTS CONSIDERED TO BE RELEVANT⁹				
Category ⁹	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³		
X Y A Y X A	FR,A,2532878 (F. SOLVINTO) 16 March 1984, see page 1, line 24 - page 2, line 5; page 4, line 25 - page 5, line 8; figure 1 --- US,A,3892024 (VAN ZYL) 1 July 1975, see column 1, line 55 - column 2, line 19; figures 1-4 --- FR,A,2407797 (J.C. SEINTIER) 1 June 1979, see the whole document --- -/-	1,2 4 7 4 1-3 8,9		
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none; vertical-align: top;"> ⁹ Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed </td> <td style="width: 50%; border: none; vertical-align: top;"> "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. "&" document member of the same patent family </td> </tr> </table>			⁹ Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. "&" document member of the same patent family
⁹ Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. "&" document member of the same patent family			
IV. CERTIFICATION				
Date of the Actual Completion of the International Search <div style="text-align: center; font-size: 1.2em;">09-10-1991</div>	Date of Mailing of this International Search Report <div style="text-align: center; font-size: 1.2em;">07. 11. 91</div>			
International Searching Authority <div style="text-align: center;">EUROPEAN PATENT OFFICE</div>	Signature of Authorized Officer <div style="text-align: center;"> Danielle van der Haas </div>			

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)		Relevant to Claim No.
Category °	Citation of Document, with indication, where appropriate, of the relevant passages	
X	FR,A,2612381 (E. MICHIT) 23 September 1988, see page 2, line 16 - page 3, line 6; figures 1,2 -----	1,5

**ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO.**

IT 9100058
SA 49300

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 29/10/91
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR-A- 2532878	16-03-84	None	
US-A- 3892024	01-07-75	GB-A- 1432242	14-04-76
FR-A- 2407797	01-06-79	None	
FR-A- 2612381	23-09-88	None	